(No Model.) 4 Sheets—Sheet 1.

H. MATTULLATH.

ELEVATOR ATTACHMENT.

No. 590,667. Patented Sept. 28, 1897.

Fig. 3.

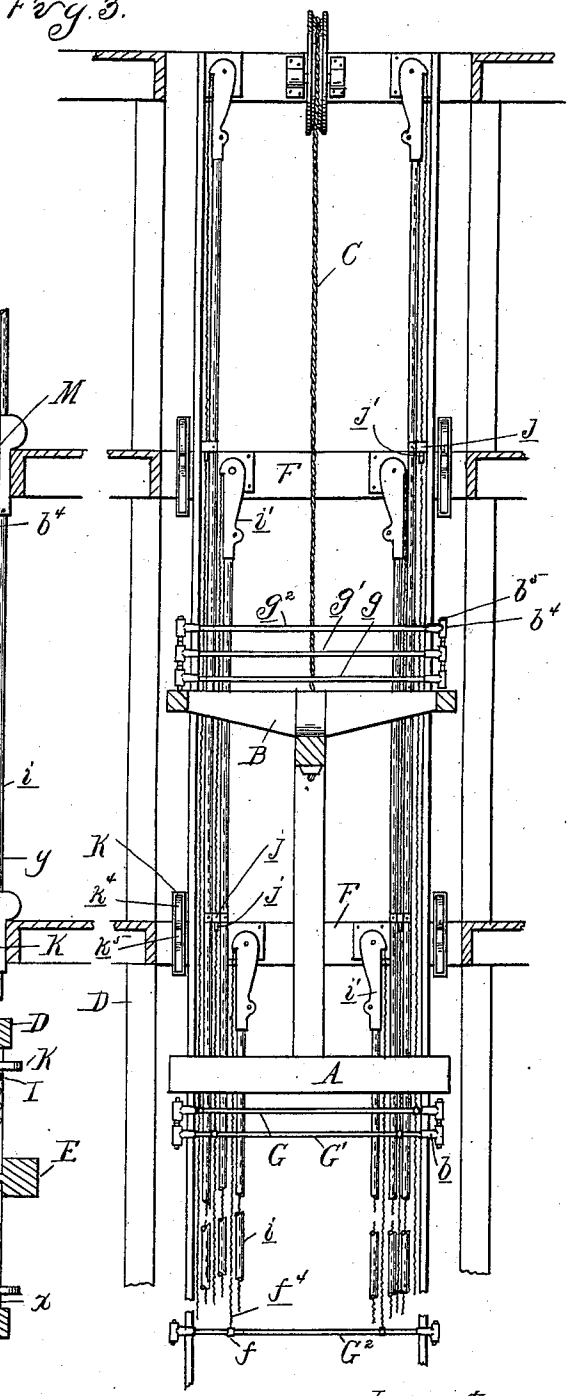


Fig. 1.

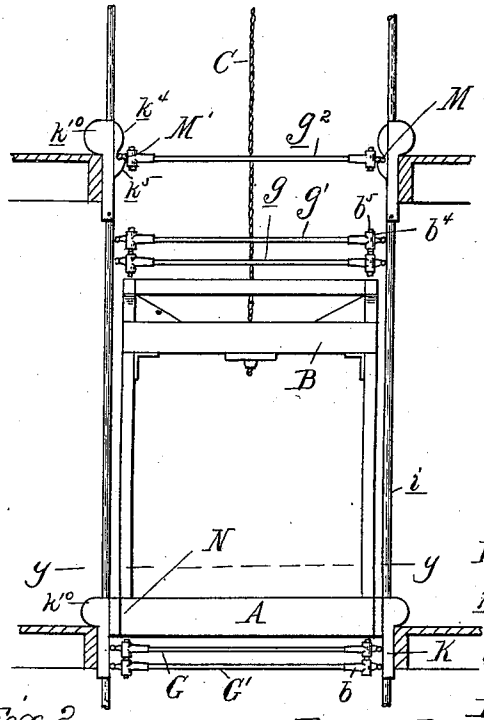
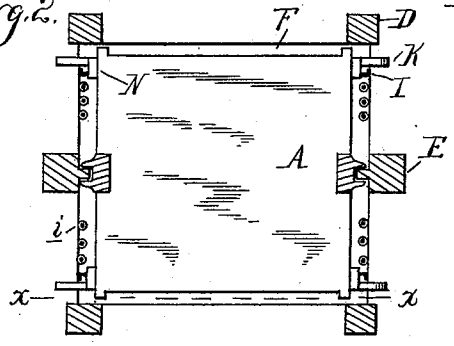


Fig. 2.



Witnesses
a. L. Hobby
W. A. Barthel

Inventor
Hugo Mattullath
By Wm. S. Spooner Son
Attys.

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Fig. 17.

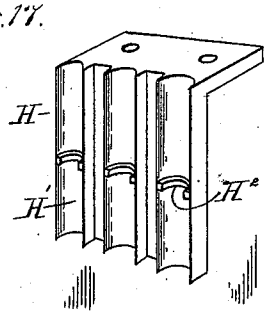


Fig. 19.

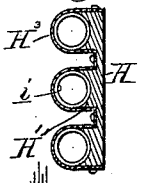


Fig. 18.

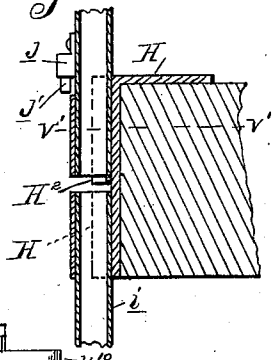


Fig. 4.

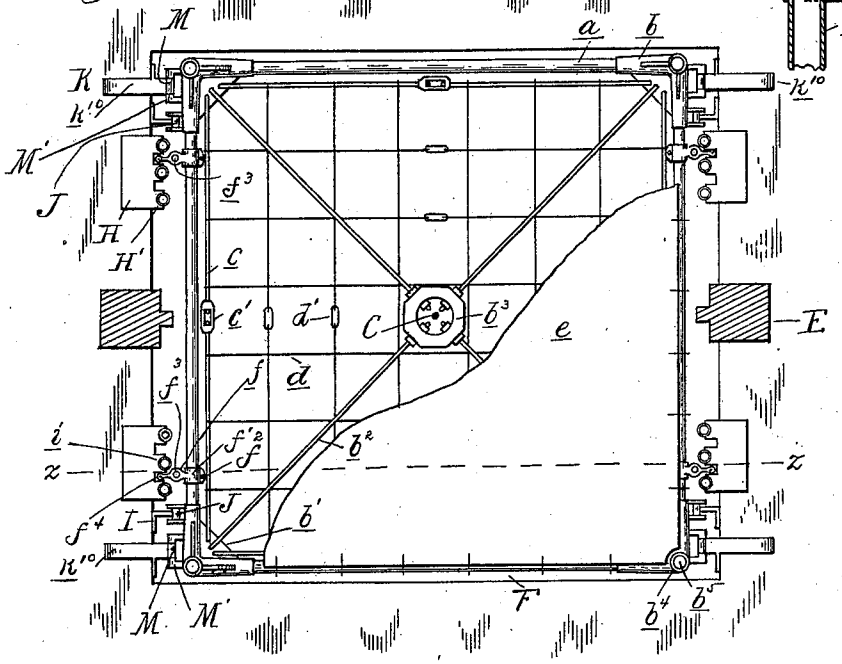
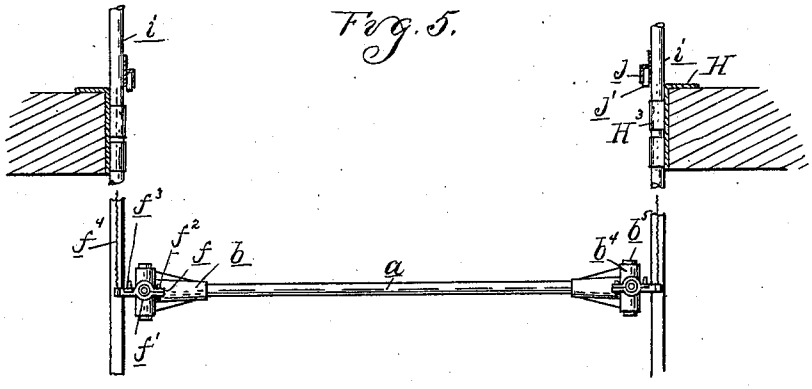


Fig. 5.



Witnesses
a. L. Hobby
O. F. Barthel

Inventor
Hugo Mattullath
By Thos. S. Sprague & Son
Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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H. MATTULLATH.

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Fig. 6.

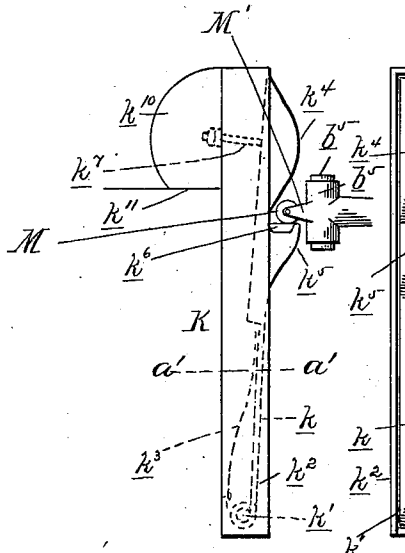


Fig. 7.

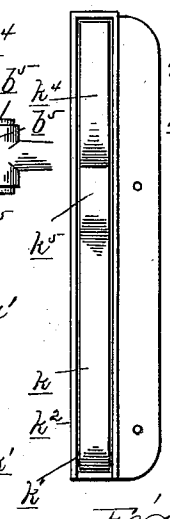


Fig. 8.

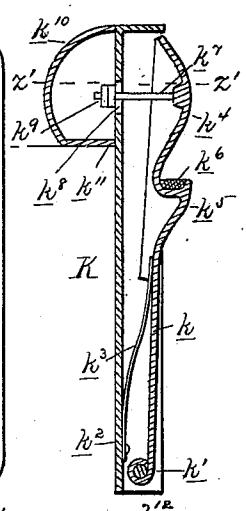


Fig. 9.

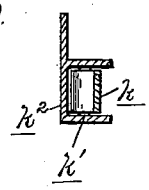
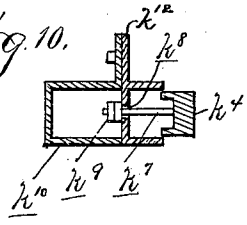


Fig. 10.



Witnesses
A. L. Habby
O. F. Barthel

Inventor
Hugo Mattullath
By Thos. S. Sprague & Son
Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 4 Sheets—Sheet 4.

H. MATTULLATH.

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Fig. 11.

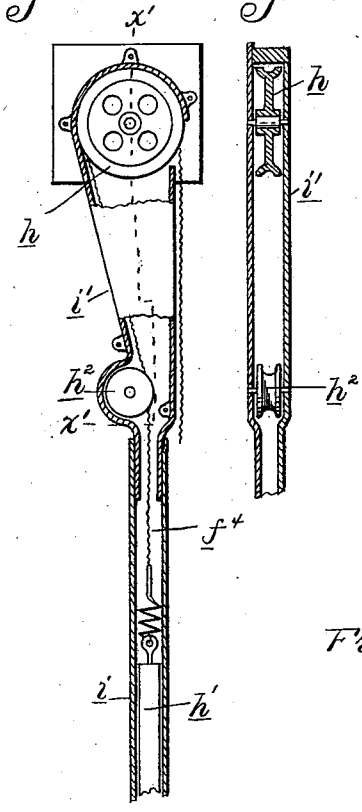


Fig. 12.

Fig. 13.

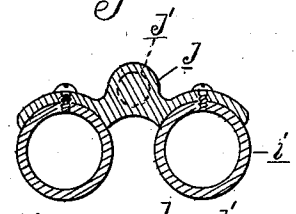


Fig. 14.

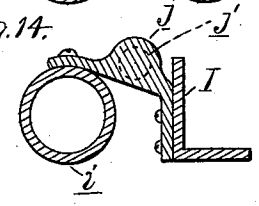


Fig. 15.

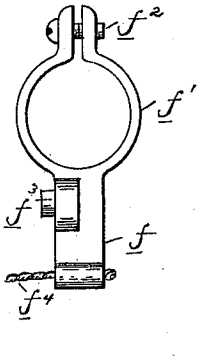
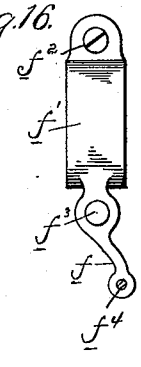


Fig. 16.



Witnesses
A. L. Hobby
O. F. Barthel

Inventor
Hugo Mattullath
By Thos. S. Sprague & Son
Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HUGO MATTULLATH, OF NEW YORK, N. Y., ASSIGNOR TO THE ANDERSON SAFETY ELEVATOR COMPANY, LIMITED, OF DETROIT, MICHIGAN.

ELEVATOR ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 590,667, dated September 28, 1897.

Application filed February 8, 1896. Renewed February 13, 1897. Serial No. 623,318. (No model.)

To all whom it may concern:

Be it known that I, HUGO MATTULLATH, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Elevator Attachments, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates particularly to devices for automatically closing the hatch-openings by means of two series of traveling platforms, one located above and one below the elevator-car and so arranged that as the latter moves upward and downward it deposits the platforms of one of the two series (the one in the wake of the elevator) in the openings of the floors and picks up and carries with it the platforms of the other series.

The invention is designed to overcome the numerous difficulties which have been met with in the practical use of devices of this kind; and, stated in a general way, it consists in the peculiar and novel construction of the platform-supporting devices on the car and in the openings of the floors whereby said supporting devices coöperate automatically in the manner stated, all as more fully hereinafter described, and shown in the drawings.

Figure 1 is a vertical section substantially on line $x\ x$, Fig. 2, showing two hatchways in the floors of a building provided with an ordinary freight-elevator equipped with the hatchway-closing devices. Fig. 2 is a horizontal section thereof on line $y\ y$, Fig. 1. Fig. 3 is a vertical section similar to Fig. 1, except being taken in a plane at right angles thereto. Fig. 4 is a horizontal section similar to Fig. 2, with one of the traveling platforms in view in the hatch-opening. Fig. 5 is a cross-section on line $z\ z$ in Fig. 4. Fig. 6 is a detached side elevation of the latch, showing it as in use to support one of the traveling platforms. Fig. 7 is a detached front elevation thereof. Fig. 8 is a vertical central section thereof. Fig. 9 is a horizontal section of the latch on line $a'\ a'$, Fig. 6. Fig. 10 is a horizontal section thereof on line $z'\ z'$, Fig. 8. Fig. 11 is a sectional side elevation of the device for counterbalancing the traveling platform. Fig. 12 is a vertical section of Fig. 11 on line $x'\ x'$. Fig. 13 is a horizontal section through one of the stops as on line $y'\ y'$ in Fig. 5. Fig. 14 is a similar section through a stop of slightly different form. Fig. 15 is a detached elevation of one of the cable-carrying arms of the traveling platform. Fig. 16 is a plan thereof. Fig. 17 is a detached perspective view of one of the supports by which the pipes are supported free to expand. Fig. 18 is a vertical section thereof on line $v\ v$, showing the same as in use. Fig. 19 is a horizontal section on line $v'\ v'$ in Fig. 18.

A is the platform of the car, B the top frame thereof, C the hoisting-cable, D the corner-posts of the shaft, E the guide-posts for the car, and F the hatch-opening in the floors of the building, all arranged to operate in the usual manner.

G G' G^2 represent a lower series of traveling platforms for closing the hatch-openings when the car goes up, and $g\ g'\ g^2$ represent an upper series of traveling platforms for closing the hatch-openings when the car goes down. These platforms are constructed as follows: Each consists of a main frame made of light and strong tubular frame-bars a, connected by means of corner-brackets b, which have tubular sleeves into which the ends of the frame-bars are secured.

The sleeves of each bracket are united by angle-braces b', integrally cast therewith and forming the means of attachment for the diagonal tie-rods b^2, which are hooked thereto at their outer ends, while the inner ends are secured to a ring b^3 in the center of the frame, the ends of the rods being screw-threaded and held by means of screw-nuts to permit of prodncing suitable tension to make the frame rigid.

The corner-brackets are further united by means of tie-rods c, which are parallel with the frame-bars. Their ends are hooked into the angle-bars b', and each has a turnbuckle c' for tightening it. Upon this frame as a foundation cross tie-rods d, having turnbuckles d', are stretched at intervals between the tie-rods c and support a fireproof covering e of asbestos sheet or any other suitable material.

Each corner-bracket is formed with vertical sockets b^4 for the reception of a rubber buffer b^5 on opposite sides of the platform.

Upon two opposite sides of each platform

each corner-bracket is further provided with antifriction-rollers M and J, journaled between suitable ears projecting laterally from the platform and serving as a means of holding and guiding the platform, as more fully hereinafter described.

All the platforms of the two series are constructed in this manner and are interchangeable with each other and each series comprises as many as there are hatch-openings to be covered. The series of platforms *g g'* (which will be called the "upper" series hereinafter) are designed to close the openings when the car descends, and they are removed from the openings and carried upon top of the car when the car ascends. The series G G' or lower series are designed to close the openings when the car ascends, and when the car descends they are removed from the openings and carried down underneath the platform of the car. To this end the lower series of platforms are carried by counterweights each secured to a cable passing over pulleys in the following manner: Upon two opposite sides, near the corners of each platform, are secured brackets *f*, as shown in Figs. 4, 15, and 16. These brackets are formed with clamping-rings *f'*, having clamping-screws f^2 for attachment to the bars *a*, and they are so secured in the different platforms as to move in different vertical paths. Each bracket is provided with a rubber buffer f^3, and to the free end is secured the cable f^4, which passes over a pulley *h* and carries a counterweight *h'*, as shown in Figs. 11 and 12. The counterweight is cylindrical and has an elastic connection with the cable. It runs in a tubular guideway *i*, composed of sections of pipe and terminating at its upper end in a casing *i'*, which incloses the pulley *h* and guide-pulley h^2.

The tubular guideway is made in sections for the purpose of providing for the expansion and contraction of the iron tubing, and the sections are held in position by means of guide-plates H, secured in the hatch-openings in the floors. These guide-plates have segmental circular guide-bearings H', provided with shoulders H^2 for supporting the sections of pipe above, while the end of the section below has a free play in the guide-bearings. The sections of pipe are retained in the guide-bearings by means of sheet-metal bands H^3, secured to the guide-plates flush with the pipes. In this manner each of the lower platforms is carried by four counterweights in such a manner that if the car ascends the counterweights compel the platform to follow it up until it is automatically stopped at its prescribed place. This is accomplished by the brackets *f* (to which the cables are attached) coming in contact with fixed stops *j*. (See Figs. 3, 5, and 13.) These brackets, as will be seen, are so arranged that they project into the interstices between the vertical pipes, which interstices are expressly provided for the purpose of forming separate guideways for these brackets and thereby keep each platform in its prescribed path while being carried up or down and also guard the brackets and cable from being interfered with and thereby prevent injury to the parts.

The stops *j* are provided with elastic buffers *j'*, corresponding to the buffers on the brackets *f*, and the stops themselves act as cross-braces for the vertical pipes by being secured to the two pipes adjacent to the interstices in which the bracket which coöperates with the stop is guided. The additional interstices for guiding the brackets of the lowest platform are obtained by means of the angle-bar I, placed contiguous to the corners, and the stops used in connection with the brackets guided in the interstices thus formed are suitably modified, as shown in Fig. 14 in horizontal section.

The angle-bars I are primarily for the purpose of guiding all the platforms in their vertical movement. They extend from the bottom to the top and are at intervals united with the vertical pipes by suitable cross-braces. For the purpose of guiding the platforms the latter are provided with guide-rollers J, journaled between lugs cast on the corner-iron *b*, all so arranged that the vibrations or the swaying of the car in its movements cannot swerve the platforms out of their prescribed vertical path.

For supporting the traveling platforms in the hatch-openings automatically-operating latches K, as represented in Figs. 6 to 10, are placed in the openings. There are four shown in each hatch-opening, all being alike and each composed of a latch-bar *k*, pivotally secured at its lower end by a pivot-pin *k'* in an outer casing k^2 and provided with an actuating-spring k^3.

The latch-bar operates in a vertical plane, and upon its face it is provided with the cam-shaped portion k^4 and with the shoulder k^5, formed below it, which latter is preferably provided with a seat of rubber k^6. When the latch-bar is depressed, it is entirely concealed within the casing, and in this position it should be preferably slightly inclined from the vertical enough to impart to it a tendency to fall outward by the action of its gravity and thus permit the use of a very light spring or dispense with its use altogether. In its normal position the latch-bar projects from the casing sufficient to expose the cam-shaped portion k^4 thereof and the shoulder k^5 beyond the vertical inner edge of the casing, and to retain the latch-bar adjustably in this position a stud k^7 is secured to it, which projects rearwardly through a slot k^8 in the casing and is provided with the adjusting-nuts k^9, which stop the latch-bar. The casing is provided with an enlargement k^{10} to inclose this stud and also form a shoulder k^{11}, on which the casing is supported upon the edge of the curbing around the hatch-opening, in which it is secured by means of the lateral flange k^{12}, formed on the side of the casing.

To operate in connection with these latches,

the traveling platforms are provided with projecting arms or, as shown in the drawings, with rollers M, journaled between ears M', formed on the corner-iron *b*, all so arranged that the platforms are adapted to be supported in position in the hatch-openings by resting with the rollers M upon the shoulder k^5 of the latches in the hatch-openings.

To operate in connection with the latches, the elevator-car is provided on the sides of its platform and in line with the latches with projections N, (see Fig. 2,) preferably of the character of a leather-covered pad which is adapted to press the latch-bars back into their casing when the car passes up and down.

The parts being constructed as shown and described, they are intended to operate as follows: When the elevator-car is at its topmost position in the building, the hatchways are closed by the platforms composing the lower series, while the platforms of the upper series are supported on top of the car. If the car now descends, (supposing for the present the lower platforms to be removed,) it will be seen that the projecting rollers M of the lowermost platform on top of the car strike the cam-faces k^4 in the uppermost hatch-opening and press the latch-bars back into the casing, while the rollers M of the next succeeding platform will keep it there, thus permitting the free passage of all the platforms except the topmost one, which is kept upon the shoulder K^5 and remains in place in the hatch-opening, and in this manner one traveling platform after the other will be arrested in the hatch-openings and close them in succession as the car progresses downward in its travel. At the same time while the car is descending, the lower series of traveling platforms which were supported in the hatch-openings are removed, owing to the action of the pads N on the platform of the car. These pads at the outset first unlatch the topmost platform of the lower series by pressing upon the cam-faces of the latches. Then in turn the topmost platform in being carried down by the car will unlatch in the same manner the platform next below and so on successively, and when the car is then in its lowermost position all the platforms of the lower series are collected below the platform of the car. If the elevator-car now ascends, the platforms will follow, owing to their being carried by the counterweights, and each platform will go as high as the stops *j* permit it to go, the arrangement of such stops being such that the lowermost platform is first arrested and the others in succession. As soon as each platform of the lower series is carried to its proper position, the further upward movement of the car frees the latch-bars and the latter will then engage with the rollers M and positively support the platforms in the opening.

I am perfectly aware that the principle of closing hatchways by means of traveling platforms is not broadly new, but the practical application has met with many difficulties which I believe are overcome in my apparatus, which is new.

What I claim as my invention is—

1. The combination with the car of an elevator, a series of traveling platforms located below the car, and independent cables and counterweights for each platform secured to brackets on said platform, of tubular guideways in which the counterweights are inclosed and sheaves supported on top thereof, said tubular guideways being supported within the hatch-opening in proximity to opposite sides of the car, and grouped in relation to the brackets to form interstices for the brackets and cables, substantially as described.

2. The combination with the car of an elevator, a series of platforms and counterweights attached to cables for supporting the platform in traveling contact below the car, of tubular guideways inclosing the counterweights and carrying the sheaves for the cables on top thereof, brackets on the platforms projecting into the interstices between the guideways and having the cables attached thereto, and stops for the brackets at the hatch-openings, substantially as described.

3. The combination with the car of an elevator, a series of platforms and counterweights attached to cables for supporting the platforms in traveling contact below the car, of a vertical guideway for each counterweight provided on top with a sheave for the cable of the counterweight, said guideway being made of sections of pipe independently supported to provide for expansion and contraction, substantially as described.

4. The combination with the car of an elevator, a series of platforms and counterweights attached to cables for supporting the platforms in traveling contact below the car, of brackets on the platforms to which the cables are attached, guideways inclosing the counterweights and arranged in groups with the brackets on opposite sides of the car to form suitable interstices for guiding the brackets, and a sheave for each cable inclosed in a casing connected to the top of each guideway, substantially as described.

5. The combination with the car of an elevator, a series of platforms and counterweights attached to cables, passing over sheaves for supporting the platforms in traveling contact with the under side of the car, of brackets on the platforms to which said cables are attached, vertical guideways inclosing the counterweights and arranged in groups with said brackets on opposite sides of the platform near the corners thereof to form interstices for the brackets and cables, stops for the brackets secured to the guideways, and cooperating elastic buffers on the brackets and stops, substantially as described.

6. The combination with the car of an elevator, a series of platforms and counterweights attached to cables passing over sheaves for supporting the platforms in traveling contact

with the under side of the car, of brackets on the platforms carrying the cables, stops located in the hatch-openings to coöperate with said brackets, latches located in the hatch-openings and adapted to engage with and support one of the platforms and projections on the platforms and car coöperating with the latches to automatically latch and unlatch the platforms, substantially as described.

7. The combination with the car, of a series of platforms supported in traveling contact with the under side of the car and provided with brackets, stops located in the hatch-openings to coöperate with the brackets, latches located in the hatch-openings, each provided with a supporting-shoulder and a cam-shaped projection on the face of the latch-bar and rollers journaled between projecting lugs on the traveling platforms adapted to coöperate with said latch-bars to latch and unlatch the platforms in the movement of the car.

8. The combination with the car, of a series of platforms supported on top of the car, and a like series of platforms below the car, and cables, sheaves and counterweights supporting them in traveling contact with the car, of vertical guide-rails for said platforms located near the corners within the elevator-shaft, guide-rollers on the platforms engaging upon said guide-rails and guiding the platforms independently of the car, latches located in the hatch-openings and provided with a supporting-shoulder and a cam-face projection above said shoulder, and rollers on the platforms adapted to coöperate with said latches, substantially as described.

9. The combination with the elevator-car, of the platform below the same, the supporting-latches for one of said platforms at each floor having pivoted latch-bars formed with a supporting-shoulder and inclined faces above and below the same, antifriction-rollers carried between ears on the sides of the platforms in line with the latch-bars and adapted to coöperate therewith to latch and unlatch the platforms in the movement of the car and corresponding projections as N in the sides of the platform of the car, substantially as described.

10. The combination with the elevator-car, of the platforms, counterweights attached to cables for carrying the platforms below the car, brackets secured upon opposite sides of the platforms and attached to the cables, guideways inclosing the counterweights and forming between them guideways for said brackets, means in the space between the elevator-hatchway and the car and forming supports for the platforms, and stops for said brackets secured to the guideways to form cross-braces for the same, substantially as described.

11. The combination with the elevator-car of the platforms below the car, counterweights for holding the platforms in traveling contact with the car and the tubular guideways extending through the openings in the floors and supporting-sheaves for the cables and inclosing the counterweights, substantially as described.

12. The combination with the car, of a platform below the car, cables attached to the platform and carrying counterweights, tubular guideways, supported in the hatchways and inclosing the counterweights and the casing i' on top of each guideway and provided with the sheave h and guide-pulley h^2 inclosed in said casing, substantially as described.

13. The combination with the car and a traveling platform below the car, of the cables f^4 attached to the platforms, the tubular guideways i supported in sections within the hatchways and provided with sheaves h and guide-pulleys h^2 for the cables, and the counterweights L′ inclosed in said guideways and elastically connected to the cables, substantially as described.

14. The combination with the car and the platforms carried by the car of supporting-latches therefor in the hatchways, each consisting of a casing k^2 having means for supporting it in the hatch-opening, a pivoted latch-bar k, and actuating-spring k^3 and a stud k^7 provided with the adjusting-nut k^9 in the free end of the latch-bar, substantially as described.

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

HUGO MATTULLATH.

Witnesses:
M. B. O'DOGHERTY,
O. F. BARTHEL.