No. 628,925. Patented July 18, 1899.

F. W. DAEUBLE.

ELEVATOR GATE.

(Application filed Mar. 10, 1899.)

(No Model.) 2 Sheets—Sheet 1.

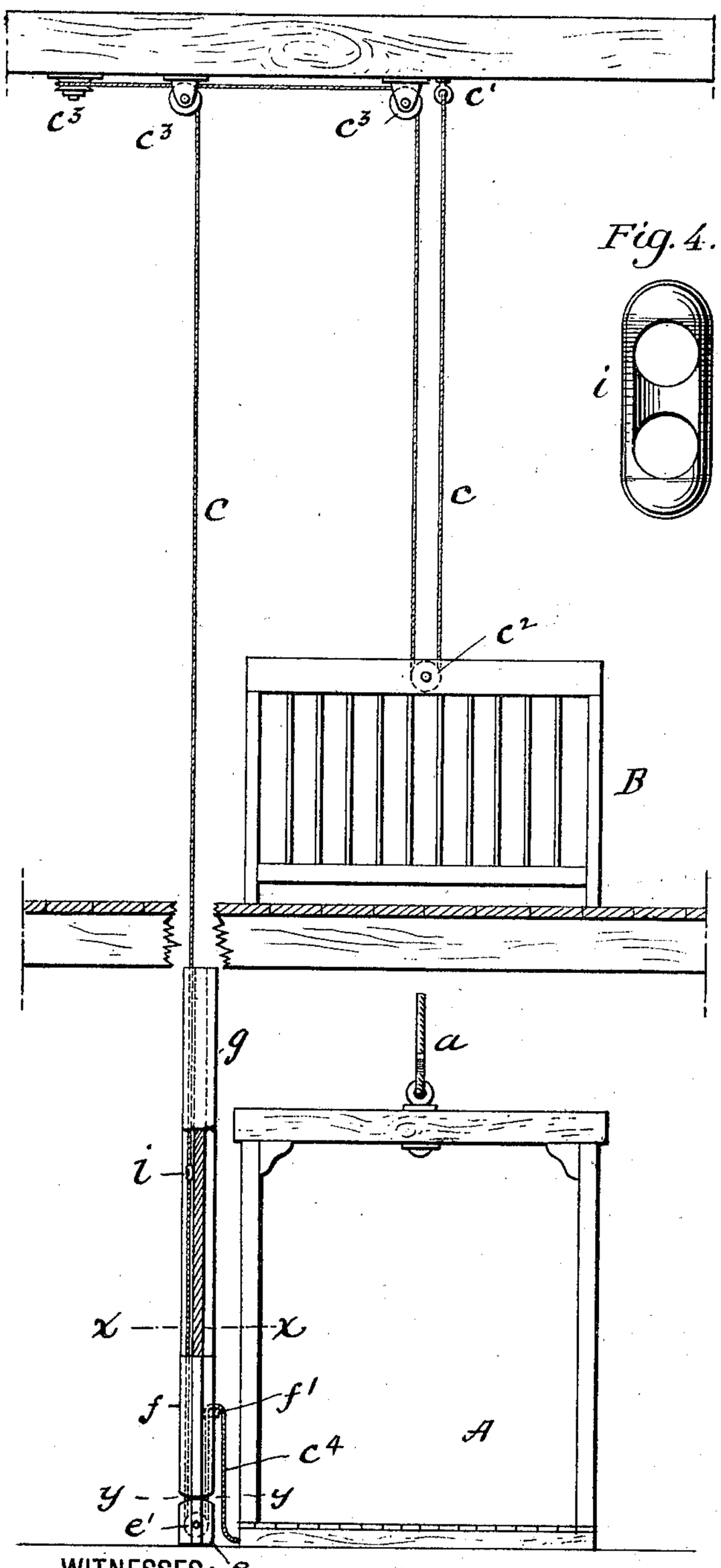

Fig. 1.

Fig. 4.

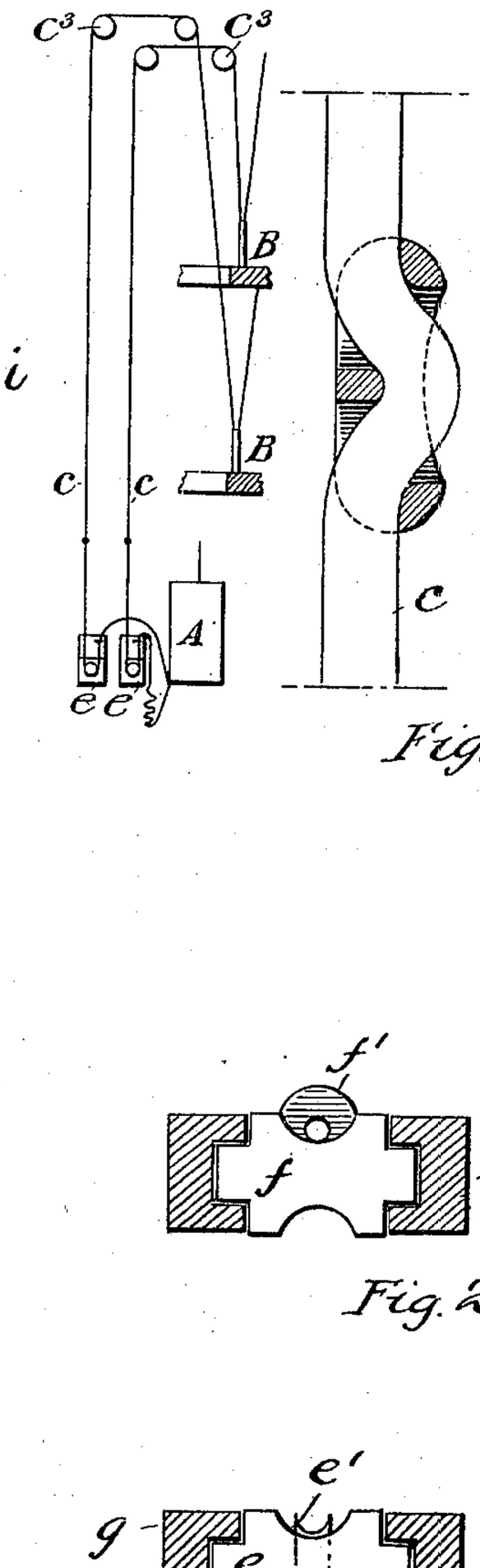

Fig. 5.

Fig. 2.

Fig. 3.

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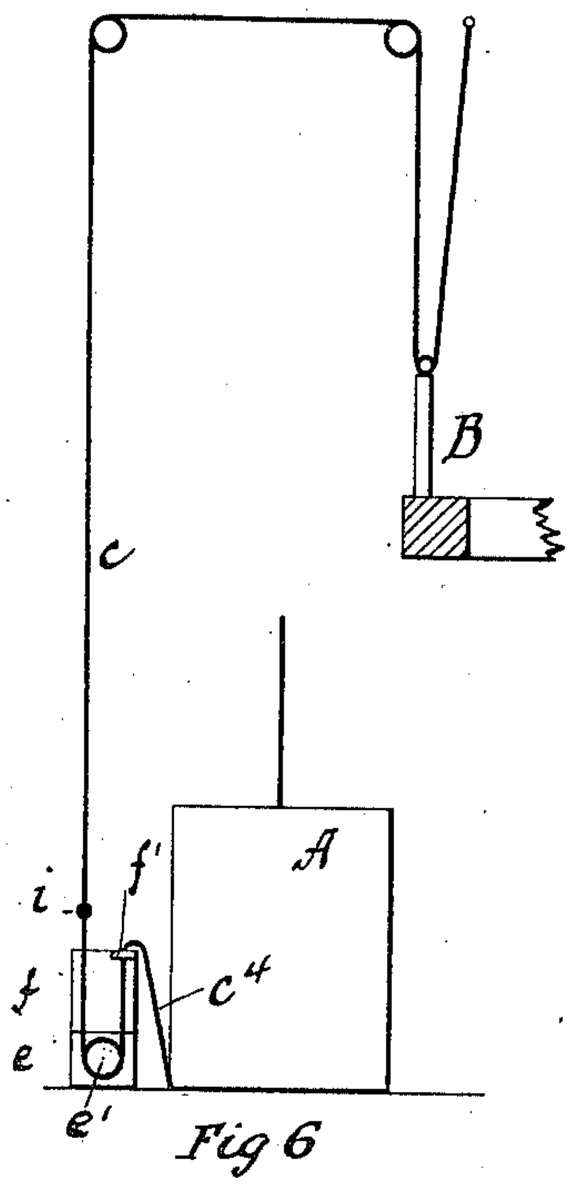

Fig 6

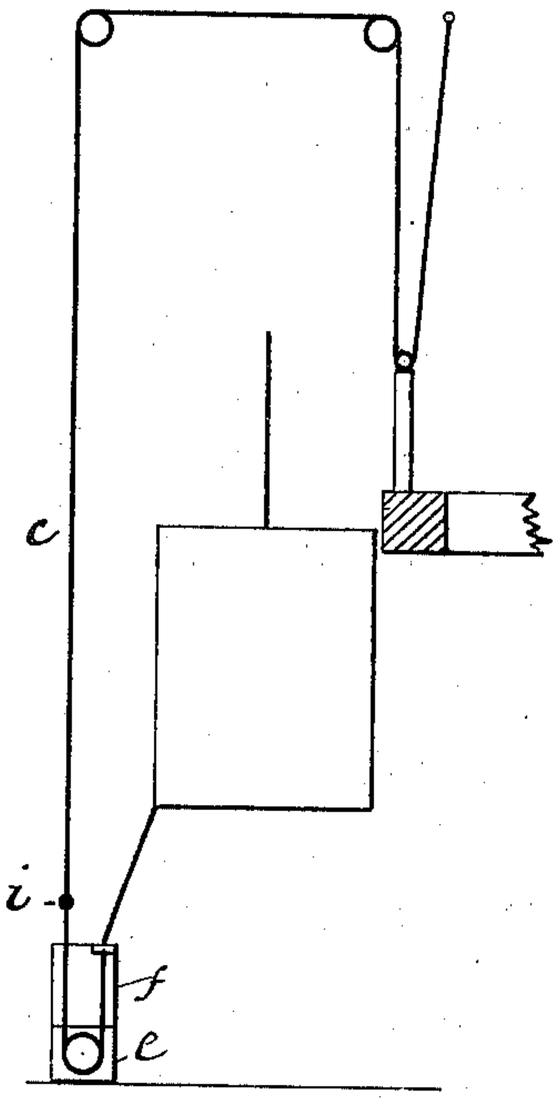

Fig. 7

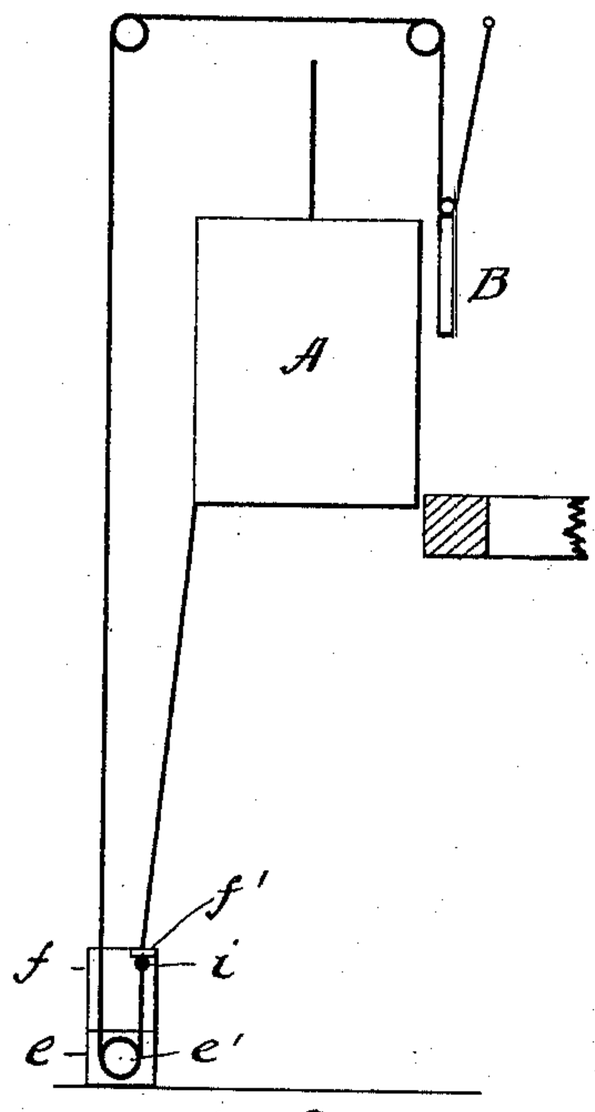

Fig. 8.

Fig. 9

Fig. 10.

Fig. 11.

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UNITED STATES PATENT OFFICE.

FREDRICK WILLIAM DAEUBLE, OF LOUISVILLE, KENTUCKY.

ELEVATOR-GATE.

SPECIFICATION forming part of Letters Patent No. 628,925, dated July 18, 1899.

Application filed March 10, 1899. Serial No. 708,548. (No model.)

To all whom it may concern:

Be it known that I, FREDRICK WILLIAM DAEUBLE, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Elevator-Gates, of which the following is a full, clear, and exact description.

This invention relates to automatic elevator-gates, the object being to provide a simple contrivance and one which will not be easily thrown out of working condition for automatically opening and closing the gates which protect elevator-shafts. This gate is intended especially for freight or factory elevators; but, as will be obvious from the description which follows, it may be applied, where desired, to passenger-elevators.

In my improved apparatus the gate is lifted by the same power that moves the elevator, the lifting-cord being attached to the car, and it is lowered by gravity; but a system of weights is used to cause the gate to lift and lower at the proper time. This will be fully described with reference to the accompanying drawings, in which—

Figure 1 is an elevation, with parts broken away, of an elevator, gate, and mechanism for operating the latter. Fig. 2 is a section of the weight-guide, taken at line $x\,x$ of Fig. 1. Fig. 3 is a section of the weight-guide, taken at line $y\,y$ of Fig. 1. Fig. 4 is a side view, and Fig. 5 a sectional view, of the "knot" on the operating-cord. Figs. 6 to 11 are conventional views of the mechanism, illustrating the operation of the gate. Fig. 12 is a diagrammatic view of the rigging when more than one gate is used.

Referring to the drawings by letter, A represents the elevator-car, which is raised and lowered through the medium of the usual cable a.

B represents an elevator-gate normally barring entrance to the shaft at one of the floors of the building in which the elevator is located. This gate is adapted to rise when the elevator approaches the floor which it protects, to remain stationary in its elevated position while the car is at the landing, and to lower to its normal closed position when the car ascends or descends from the landing.

c represents the gate-operating cord. It is preferably attached to a support above the gate at c', then leads over a sheave c^2 on the gate, then returns to a point near c' and is led over a number of sheaves c^3, thence vertically down the side of the elevator-shaft, around a pulley e' in a movable weight e, thence upward through an eye in a lug f', attached to another movable weight f, arranged above and resting upon the weight e, and thence to the bottom of the elevator-car, where it is fixed. The weights e and f run in vertical guides $g\,g$ and on each side are provided with grooves to accommodate the cord. The combined weight of e and f is greater than the weight of the gate, while the weight of e alone is less than that of the gate. At a proper point on the cord c a bead, ball, or other enlargement i is secured, which for facility of description I will hereinafter term a "knot," and, indeed, a knot in the rope might serve the same purpose. As constructed, however, this knot is an elongated rounded body, having two lateral openings through which the cord passes successively to form a kink therein, and while effectually preventing the slipping of the knot when tension is on the cord at the same time permits of easy adjustment to any position by slacking the cord and slipping the knot to the desired location thereon.

When the car is at the lower floor, the gate at the floor above is closed and the weights e and f rest upon the lower floor, as shown in Figs. 1 and 6, beside the car. In this position the slack c^4 in the cord c must be taken up before any pull can be exerted upon the cord by the car. Accordingly, when the car rises it first straightens out this slack, the cord becoming taut at about the time when the roof of the car reaches the floor above, as shown in Fig. 7. In the continued ascent of the car the cord is pulled, and by reason of the fact that the weights e and f are both resting on the cord at the turn of the loop the pull upon the cord will be communicated directly to the gate and the same will be lifted to the position shown in Fig. 8, at which time the floor of the car is on a level with the landing. In the meantime the knot i has been carried down around the sheave in weight e and has just reached the under side of the lug f' on

weight *f*. If the car then moves upward, weight *f* will be lifted by reason of the engagement of the lug by the knot and the gate will be correspondingly relieved of the weight of *f*, whereupon the gate, being heavier than weight *e* alone, will lower and close the shaft-opening, weight *e* meanwhile rising, as indicated in Fig. 9. Further upward movement of the car will simply carry the weights higher without affecting the gate. If the car descends from the position shown in Fig. 9, the weights will be lowered, but *f* will travel twice as fast as *e* and will overtake it and rest upon it very soon. The combined weights then being at the bottom of the loop will be sufficient to lift the gate and will have it fully elevated at the moment the car reaches the landing, at which moment also the weights will come to rest upon the floor. The knot has meanwhile remained at the under side of the lug *f'*, but without supporting it, this condition being shown in Fig. 10. If now the car continues downward, the slacking cord will permit the gate to fall, the knot being carried around sheave *e'* to its starting position. When the gate is fully down, the movement of the cord ceases and the slack c^4 is accumulated by the further travel of the car, as shown in Fig. 11. In case the car descended after stopping at the first landing instead of ascending, as described, the slack on the cord would thus permit the gate to descend by its own weight, the two weights *e* and *f* meanwhile resting upon the floor.

In case the elevator-shaft extends through a number of floors there will be provided a separate system of weights and cords for the gate at each floor, the only difference in the arrangement being that the slack portion c^4 of the cord for each successive gate will be longer by the distance between the floors, the weights for all the gates being located at the foot of the shaft, as indicated in Fig. 12.

It will be observed that owing to the simplicity of the apparatus it will be very durable and will easily stand the rough usage to which it is likely to be subjected in a shop or factory, particular attention being called to the fact that in case the gate is held down or obstructed in its movement no injury to the apparatus can take place, since the weights, being free to move at all times, will be raised or lowered by the car to compensate for any inaction on the part of the gate.

Fig. 1 illustrates the preferred arrangement of the rigging, wherein it will be seen that one-half of the weight of the gate is supported by the beam above, thus making it possible to use lighter weights and entail less work upon the motive power of the elevator; but this arrangement causes the gate to move at one-half the speed of the car, and consequently the slack c^4 would have to be taken up by the car in time to have the gate wide open when the car reaches the landing.

Having described my invention, I claim—

1. The combination of an elevator-car, an elevator-gate a cord connecting the two together, a weight acting through the cord to oppose the weight of the gate, and means for shifting the weight to the car to relieve the gate, substantially as described.

2. The combination of an elevator-car, an elevator-gate, a cord connecting the two together whereby the car may move the gate, said cord having a vertical loop formed in it between the car and gate, a weight normally supported by both sides of said loop and means for transferring it entirely to that side of the loop to which the car is connected to thereby relieve the gate and allow it to move by gravity.

3. The combination of an elevator-car, an elevator-gate, a cord connecting the two together whereby one is moved by the other, two weights applied to said cord, the combined weights overbalancing that of the gate, while the weight of the gate will overbalance one of the weights alone, and means whereby one of the weights may be shifted from the gate entirely upon the car, substantially as described.

4. The combination of an elevator-car, an elevator-gate, a cord connecting the two together whereby the gate is moved by the car, said cord having a vertical loop, two weights normally supported at the turn of the loop by both sides thereof, and means whereby one of the weights may be shifted to one side of the loop to thereby relieve the other side, for the purpose set forth.

5. The combination of an elevator-car, an elevator-gate, a cord connecting the two together, a movable pulley around which the cord is led to form a vertical loop, a weight normally supported by both sides of said loop, said cord and weight provided with interlocking devices whereby the traverse of the cord around the pulley will carry the interlocking devices into engagement and shift the entire weight to one side of the loop, for the purpose set forth.

6. The combination of an elevator-car, an elevator-gate, a cord connecting the two together whereby one is moved by the other, two weights, one normally resting upon the other, their combined weight overbalancing that of the gate, while the weight of one of them underbalances that of the gate, a guiding-sheave for the cord in the lower weight, a knot in the cord and a lug on the upper weight adapted to engage with each other to lift the upper weight from the lower, for the purpose set forth.

In witness whereof I subscribe my signature in presence of two witnesses.

FREDRICK WILLIAM DAEUBLE.

Witnesses:
HENRY SCHANZENBACHER,
L. H. BRUSSELBACH.