(No Model.)

C. F. DE ARDEN.

DEVICE FOR OPERATING ELEVATOR GATES.

No. 512,813. Patented Jan. 16, 1894.

Fig. 1.

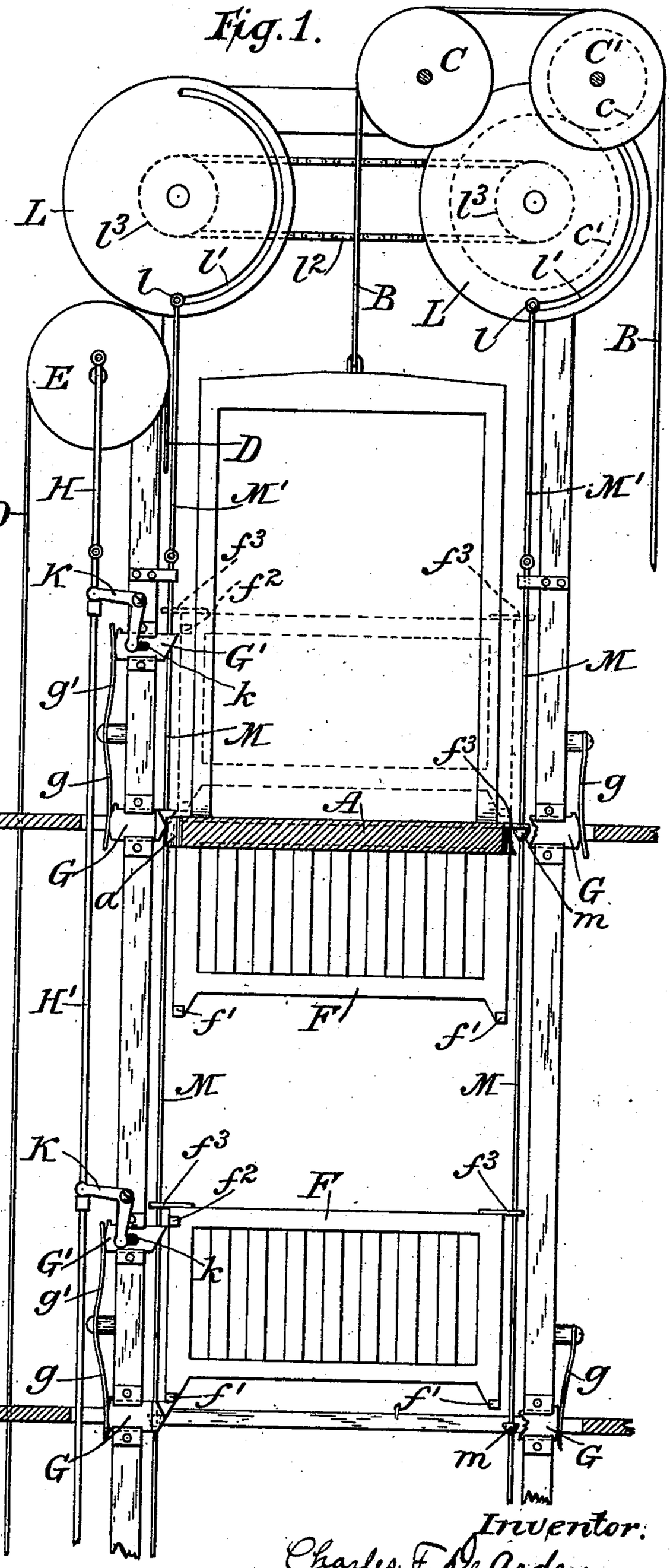
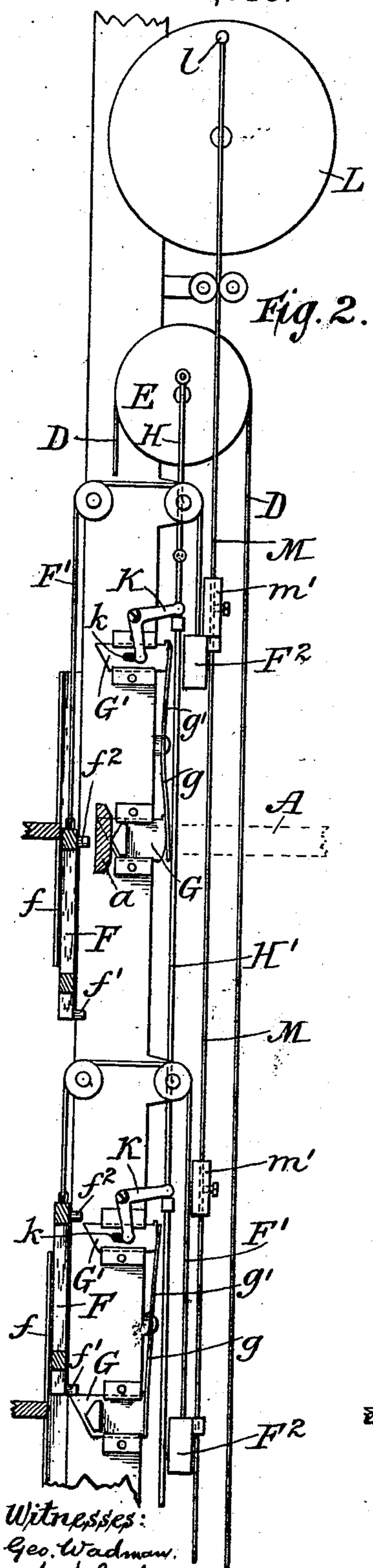


Fig. 2.



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DEVICE FOR OPERATING ELEVATOR-GATES.

SPECIFICATION forming part of Letters Patent No. 512,813, dated January 16, 1894.

Application filed May 10, 1893. Serial No. 473,641. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. DE ARDEN, of the city, county, and State of New York, have invented a new and useful Improvement in Devices for Operating Gates to Elevator-Wells; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

In Letters Patent of the United States No. 494,126, which were granted to me March 28, 1893, and in an application for Letters Patent, Serial No. 463,062, filed February 20, 1893, I have shown and described certain devices for operating gates to elevator wells whereby the gate may always be in position to close the approach to the well, except when the elevator-car is at the level of the floor, at which time the gate will move automatically out of the way. The devices shown in said patent and application were primarily intended for use with elevators of the class known as basement elevators, and when so used they are practical and efficient; moreover such devices, particularly those shown in said application, are applicable to elevators which travel through two or more floors, but the objection to these devices when so employed is that every gate is opened when the elevator-car reaches its floor whether the car stops or not unless the conductor withdraws the gate-actuating devices.

The object of my present invention is therefore to overcome this objection and to produce means for operating the gates whereby each gate shall automatically move out of the way only when the car stops at its floor. I accomplish this object by the construction hereinafter described, the several features of my invention being pointed out in the claims.

In the drawings: Figure 1 is an elevation of an elevator-well equipped with my improvements, looking from within outwardly toward the front of the well, portions of two floors and the platform of the elevator-car being shown in section. Fig. 2 is a view of one side of an elevator-well equipped with a modified form of my improvements, the gates and a cam which is carried by the cars being shown in section, while the platform of the car is indicated in part by dotted lines.

The car A may be of any desired construction and, as shown, is adapted to be raised and lowered through the medium of a cable B which passes over guide-pulleys C, C′, at the head of the well. The movement of the car is controlled in the usual manner by a check-rope D which also passes over a suitable guide-pulley E at the top of the well and, as usual, is passed through the car so that it may be grasped by the conductor. Any other form of controlling mechanism which is similar in general principles to that shown might be used and the operation of the controlling mechanism of whatever form is in no way affected by the use therewith of my improvements, although the movement of controlling mechanism in stopping the car is taken advantage of to produce the proper action of a portion of the mechanism which directly embodies my improvements.

As represented in the drawings, each gate F is adapted to move out of the way by dropping below the level of the floor. It travels in suitable guides which are shown at *f* in Fig. 2 and is provided with suitable projections f', f^2, for engagement with the latches which hold it in its normal position. It may also be provided with projections f^3, as shown in Fig. 1, for direct engagement with the means which act to move the gate into position in opposition to its own weight.

For each gate there are two latches, or two sets of latches, which normally hold the gate in position. As shown in the drawings, these latches are spring-pressed sliding bolts G, G′, which are adapted to engage respectively with the projections f', f^2, on the gate F and are disposed one above another, but it will be evident that they might be placed side by side and adapted to engage the same lugs or projections on the gate, it being only necessary that the two latches shall be so arranged that the gate shall be held in position at all times unless both latches are withdrawn together.

The latch G is adapted to be withdrawn against the pressure of its spring *g* by a cam or incline *a* which is fixed to the car in such a position that, when the platform of the car is on a level with any floor the latch G at that

floor shall be withdrawn. Each latch G′ is arranged to be withdrawn against the pressure of its spring *g′* only when the car is stopped by the conductor at the corresponding floor, and I have taken advantage of the movement of the controlling mechanism, which is represented by the check-rope D and pulley E, to effect the withdrawal of the latches G′. For this purpose the rotation of the wheel E, as the check-rope D is moved to stop the car, is caused to withdraw all of the latches G′ through the intermediary of suitable connecting devices such as the link H, rod or connector H′, and bell-cranks K. As represented, each bell-crank K engages with the corresponding latch G′ through a slot *k* to permit the proper degree of independent movement of the one with respect to the other, and the cranks are not connected directly to the rod H′ but are actuated by a stop fixed to the rod. Inasmuch as the part H, H′, has to perform its function only during its upward movement it is obvious that a cord or other flexible connection might be used instead thereof.

The movement of each gate in one direction is effected by gravity while the action of the hoisting mechanism is caused to effect its movement in the opposite direction. A convenient arrangement for this purpose is that represented in the drawings, in which one of the guide-pulleys C′ at the top of the well is shown as adapted to drive through intermediate gears *c*, *c′*, a crank-disk L. To the eccentric pin *l* of the crank-disk is connected a lifter M which passes freely through perforations in the projections f^3 of each gate and has fixed in proper position beneath each projection f^3 a stop or lug *m* which is adapted to engage the projection during the upward movement of the lifter. The stops *m* are so placed and the eccentricity of the pin *l* is such that at each rotation of the crank-disk L any gate F which may have been dropped out of the way shall be raised again into position to close the approach to the well and to be engaged by the latches G, G′. It is obvious that the gates which are already in their elevated positions will not be affected by the movements of the lifters. In order that the lifters may be brought to their lowest positions whenever the car is stopped, the crank disks L are provided with slots *l′* in which the eccentric pins *l* are adapted to slide freely. The raising of the lifter is effected through the contact of the eccentric pin with the rear end of the slot *l′*. The two eccentric cranks L, L′ may be driven in unison by any suitable means such as a chain l^2 and gears l^3, it being desirable, especially when the gate is moved vertically, to have the moving force applied at each end of the gate. I have represented the lifter as composed of a rod M and a link M′, but a cord or chain might be used instead thereof.

From the foregoing description it will be clear that no gate will move out of the way unless both latches G, G′, or both sets of latches, if latches are used at both sides, are withdrawn at the same time and that as the two latches or sets of latches are operated by independent means, such means must act simultaneously in order to permit the gate to move. The independent means are respectively the controlling mechanism of the car and the car itself. Therefore, although one latch is withdrawn whenever the car is at the level of the floor, whether moving or stationary, the gate will still be held by the other latch unless it is withdrawn by the action of the controlling mechanism. Furthermore, although all the latches G′ of the several gates are withdrawn whenever the car is stopped, no gate will move except that one opposite which the car has been stopped.

In the construction shown in Fig. 2 each gate is connected by a cord F′ to a counterweight F^2 which is nearly but not quite sufficient to raise the gate. The lifter M, instead of acting upwardly directly upon the gate itself, has fixed to it in the proper relative positions supplementary weights *m′* which are adapted, at such rotation of the crank-disk L, to bear upon such of the weights F^2 as may happen at the time to be in their elevated positions and, by means of the additional weight so applied, overbalance the gate F and cause it to move into position to close the approach to the well. The means for operating the latches in this construction may be the same as in the construction represented in Fig. 1.

Though I have described and shown certain particular forms and arrangements, it will be understood that these may be varied to suit the different requirements of the place of use or of the style of elevator with which my devices are employed.

I claim as my invention—

1. The combination with a movable gate adapted to close the approach to an elevator well, of independent latches to retain said gate in its normal position, an elevator-car, means operated by the car to withdraw one of said latches, and independent means adapted to be set in operation by the conductor to withdraw the other of said latches, substantially as shown and described.

2. The combination with a movable gate adapted to close the approach to an elevator well, of independent latches to retain said gate in its normal position, an elevator car, controlling devices for starting and stopping the car, means operated by the car to withdraw one of said latches and means operated by said controlling devices to withdraw the other of said latches, substantially as shown and described.

3. The combination with a movable gate adapted to close the approach to an elevator well, of independent latches to retain said gate in its normal position, an elevator-car, a check-rope for controlling the movement of said car, devices operated by the movement of said check-rope to withdraw one of said latches, and a cam carried by the car to with-

draw the other of said latches, substantially as shown and described.

4. The combination with a movable gate adapted to close the approach to an elevator well, of a car, hoisting mechanism for said car, a crank-disk driven by said hoisting mechanism and a lifter operated by said crank-disk and adapted to engage said gate, substantially as shown and described.

5. The combination with a movable gate adapted to close the approach to an elevator well, of a car, hoisting mechanism for said car, a crank disk driven by said hoisting mechanism, and provided with a slot, an eccentric pin sliding freely in said slot, and a lifter connected to said pin and adapted to engage said gate, substantially as shown and described.

6. The combination with a movable gate adapted to close the approach to an elevator well, of a car, hoisting mechanism for said car, means actuated by said hoisting mechanism to move said gate, controlling devices for starting and stopping the car and a latch adapted to retain said gate in position and operated by the movement of said controlling devices, substantially as shown and described.

7. The combination with a movable gate adapted to close the approach to an elevator well, of a car, hoisting mechanism for said car, a crank disk driven by said hoisting mechanism, a lifter operated by said crank disk and adapted to engage said gate, and a latch adapted to retain said gate in position and to be withdrawn by the movement of the car, substantially as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES F. DE ARDEN.

Witnesses:
A. N. JESBERA,
A. WIDDER.