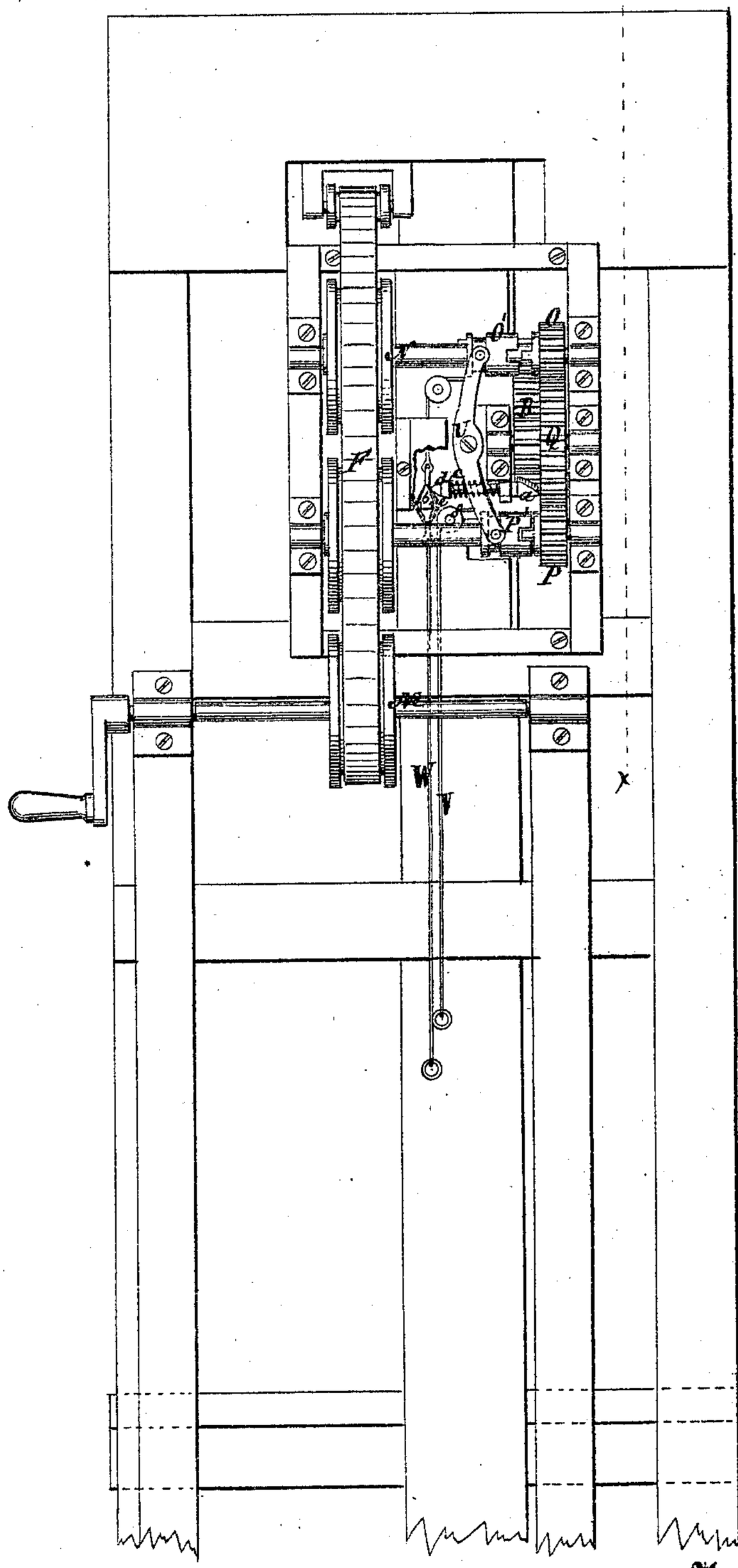
(79.)

2 Sheets--Sheet 1.

W. LIVINGSTONE & W. F. HOLSKE.

Improvement in Elevators.

No. 122,839. *Fig. 1.* Patented Jan. 16, 1872.



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(79.) 2 Sheets--Sheet 2

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Improvement in Elevators.

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Fig. 2.

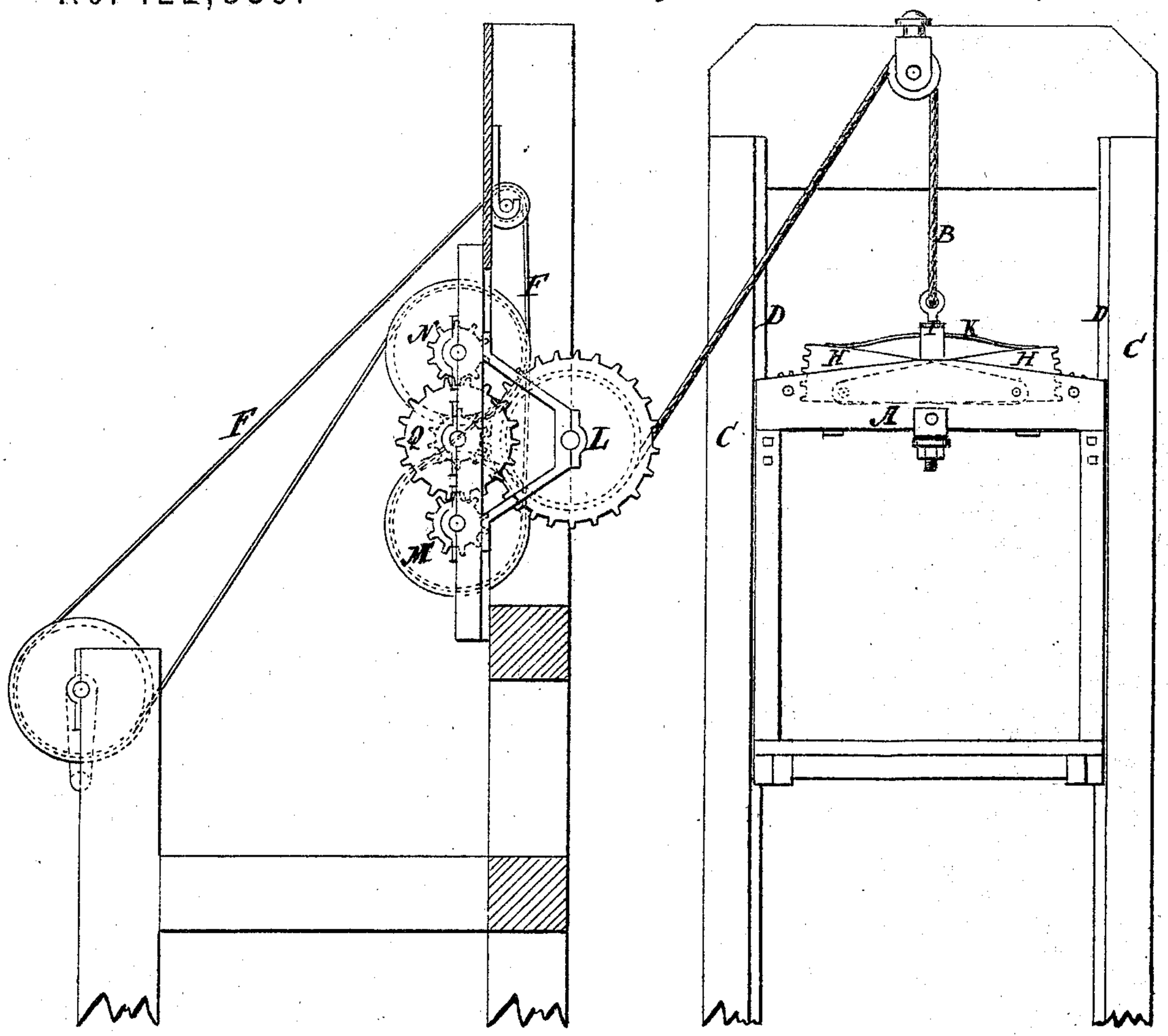
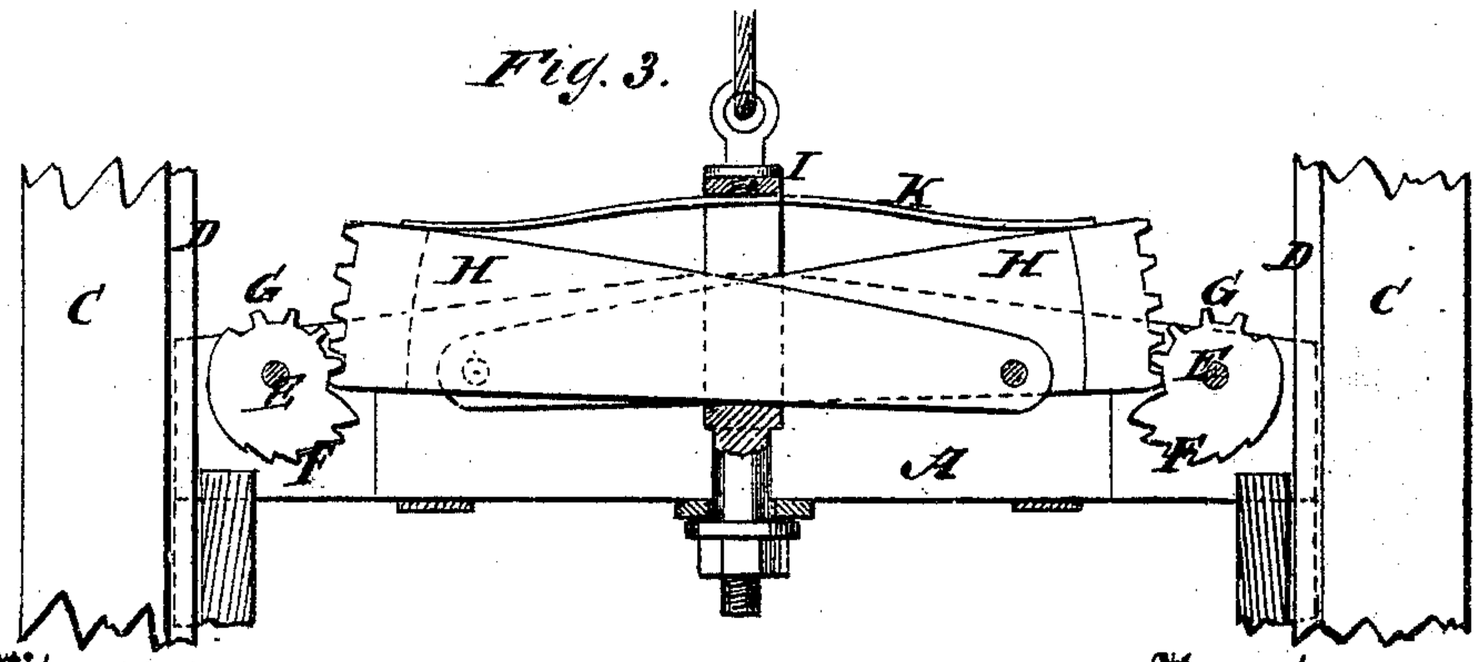


Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM LIVINGSTONE AND WILLIAM F. HOLSKE, OF BROOKLYN, ASSIGNORS TO WILLIAM F. HOLSKE AND WILLIAM H. SILBERHORN, OF NEW YORK CITY, N. Y.

IMPROVEMENT IN ELEVATORS.

Specification forming part of Letters Patent No. 122,839, dated January 16, 1872.

Specification describing a new and Improved Elevator, invented by WILLIAM LIVINGSTONE and WILLIAM F. HOLSKE, of Brooklyn, in the county of Kings and State of New York.

The first part of our invention consists of a combination of toothed eccentric wheels or pawls and weighted levers gearing with them, with the carriage, its actuating-rope, and wood or other elastic guides, in such manner that the said toothed eccentric wheels will be caused to engage or bind against the wood guides by the gravity of the levers, or by the same and a spring to lock the carriages and prevent falling in case of accident. The essential object of this invention is to avoid the expensive toothed or notched iron bars and the iron pawls now used, which, besides being expensive, are also objectionable on account of their liability to break for want of elasticity by the sudden shock when catching the car. The second part of this invention consists of a system of intermediate driving and reversing gearing between the driving-belt, by which the carriage is actuated, and the drum of the hoisting-rope, whereby the carriage is operated at will in either direction by the said driving-belt constantly moving in one direction, the shifting being readily effected by suspended cords, such as commonly used in elevators for actuating the reversing-gear. This part of the invention also comprises a novel friction-brake device, which, being also worked by the reversing-cords, comes into action at that moment when in the reversing of the clutches the drum is entirely disconnected from the driving-belt, and retains the drum until, by the continuation of the action of the shifting-gear after the clutch has been released, the drum becomes completely disengaged and the connecting one fully engaged, thus positively holding the carriage during the time of changing the connection and while both clutches are disconnected to allow the carriage to rest. The essential object of the second part of the invention is to provide a simple and efficient system of connecting reversing-gear, whereby elevators may be worked from shafting of factories, &c., continuously moving in one direction, and thus save the necessity of employing special engines for reversing the carriage by reversing the valves.

Figure 1 is a front elevation of the driving and reversing gear. Fig. 2 is a sectional elevation of Fig. 1 on the line *x x*, and side elevation of the carriage, the locking devices therefor, and the guides for the carriage; and Fig. 3 is a sectional elevation of part of the carriage.

Similar letters of reference indicate corresponding parts.

A is the upper cross-beam of the carriage; B, the hoisting-rope; C, the vertical guide-posts; and D, the ribs thereon for guiding the carriage. These ribs we make of wood or other like elastic substance, and plain, instead of the notched iron bars commonly used, and we use toothed wheels E on the carriage, with an eccentric toothed face, F, to bind on the guides, and a concentric part, G, by which they are geared with the weighted end of a lever, H, having corresponding teeth on one end matching with said part G, the other end being pivoted to the beam A; and the two bars—one for each wheel—pass through the yoke I, by which the rope B is connected to the carriage, and is so adjusted relatively thereto that when the carriage is suspended on the rope and the yoke is raised to its uppermost position relatively to the beam said levers will be raised, as shown in Fig. 3, and the face F of wheels E will be turned away from the guides D, and when the rope breaks the weighted end of the levers will fall, together with the yoke I, and throw the said toothed eccentric faces F of the wheels back against the guides, with which they will bind, and instantly lock the carriage securely against falling. K is a spring that may be used to act in conjunction with the gravity of the weighted levers, if necessary, to accelerate their action. In this case the spring is represented as being introduced between the upper end of the slot in the yoke and the upper edge of the levers, but it may be arranged in any approved way. It is believed that, besides a considerable economy in the first cost, this plan will be found preferable to the notched bars and levers or pawls on the score of safety; also to lessen shocks in stopping the carriage. L is the drum for the rope B, and M and N driving-wheels for working it, gearing with it by means of pinions O P, an oiler, Q, pinion R, and wheel S, said wheels M and N being con-

stantlyturned in opposite directions by any competent means, say a belt, T, and the connection being shifted from one to the other, as required, by clutches O′ P′, the oscillating lever U, and the cords V W, the said pinions being loose on their shafts, and the arrangement being such that when one clutch is thrown out the other is thrown in. It is also such that, the lever U being stopped intermediately between the extremes of its movements, both clutches will be disconnected to allow the carriage to rest. But, as the carriage would fall at this time unless otherwise supported, we have provided friction brake-bar *a* for engaging idler-wheel Q by a groove in one side, and arranged a double cone-shaped piece, *b*, in one of the shifting-cords between two sections of it, to be pulled against one end of said bar *a* and force it into said groove at the same time the cords are pulled to actuate the shifting-lever U. This piece is so arranged relatively to the brake-bar that, at the time both clutches are disconnected, both portions of it corresponding to the bases of the cones will be against the pointed end *d* of said bar, holding the other end firmly in the groove of wheel Q; and this part of said piece *b* is provided with a slight annular groove, *e*, into which the said end *d* of said bar *a* falls, and is retained as long as the carriage is to be held at rest. Then, by pulling said piece beyond the end *d* either way, one of the clutches will be engaged, the brake will be withdrawn by its spring S, and the carriage is set in motion. Thus we are enabled to drive the carriage in either direction by a power constantly moving in one direction, and to hold said carriage while shifting from one connection to the other, so as to insure the entire disconnection ot one clutch and the cessation of the motion of the drum and carriage before the other reversing connection is formed, so that there is no clashing of any counter forces; also to allow the carriage to stop as required by apparatus set in motion by the same act by which the reversing is effected.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. The toothed eccentric wheels, the weighted levers gearing with them, the carriage with its actuating-rope, and the elastic guides, all combined, constructed, and arranged in an elevator, as and for the purpose described.

2. The combination of the drivers M N and the connecting-gear and shifting devices with the elevator-drum L, substantially as specified.

3. The combination of the friction-brake *a* and double conical piece *b* with the train connecting the drivers and the drum, the shifting devices, and actuating-cords, substantially as specified.

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