No. 651,236. Patented June 5, 1900.

D. CORCORAN.

ELEVATOR.

(Application filed Jan. 2, 1900.)

(No Model.) 3 Sheets—Sheet 1.

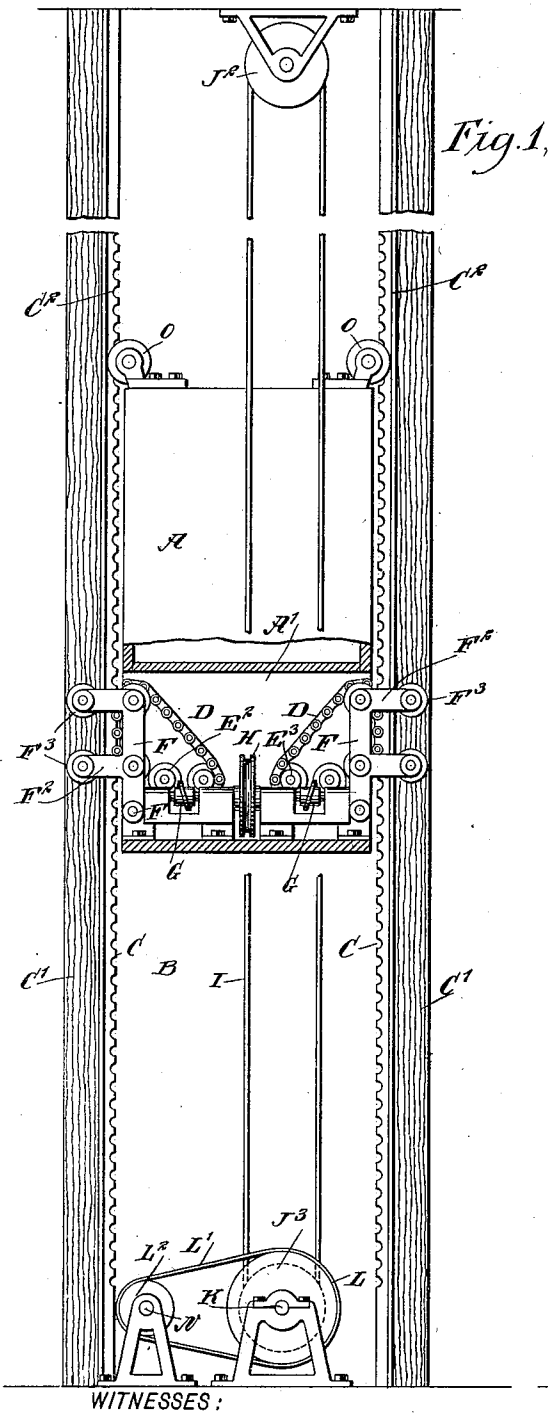

Fig. 1.

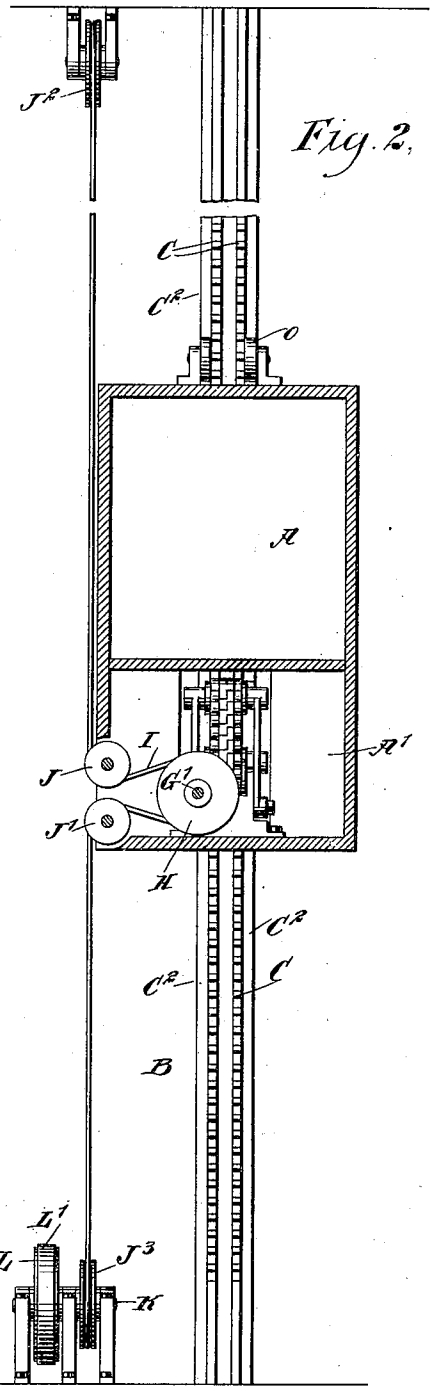

Fig. 2.

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Fig. 3,

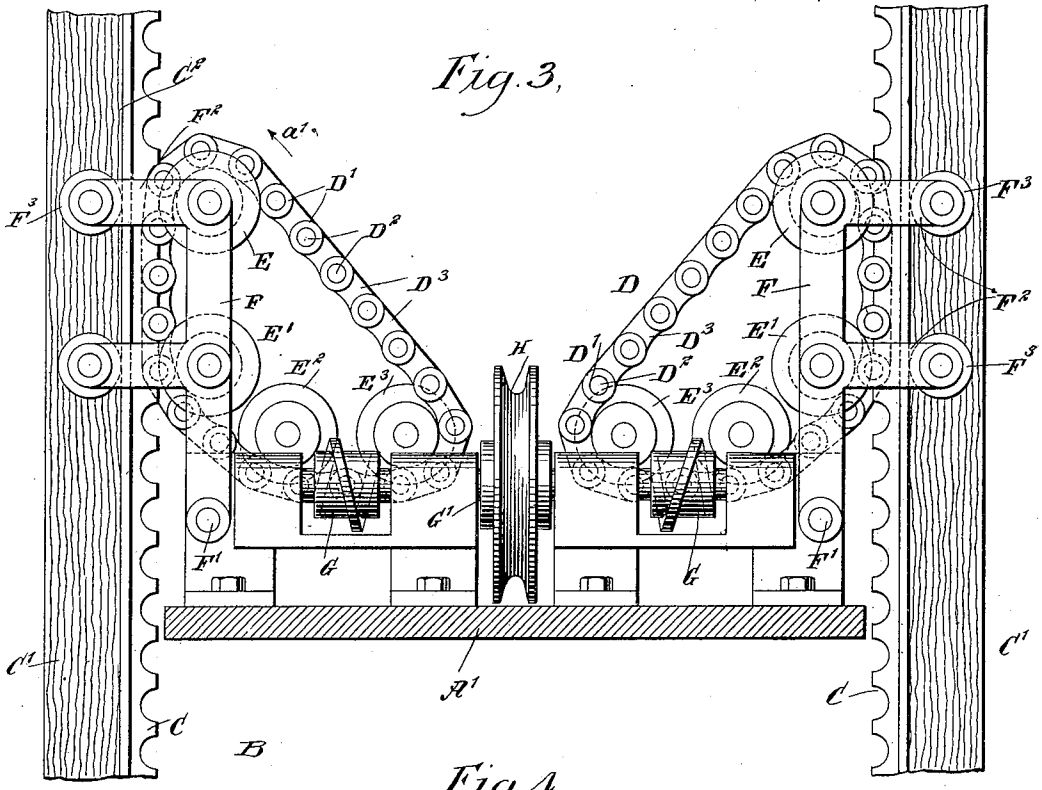

Fig. 4,

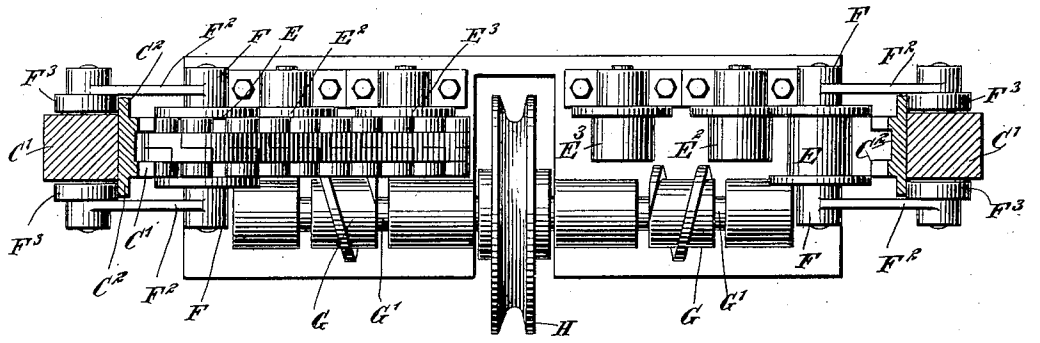

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Fig. 5.

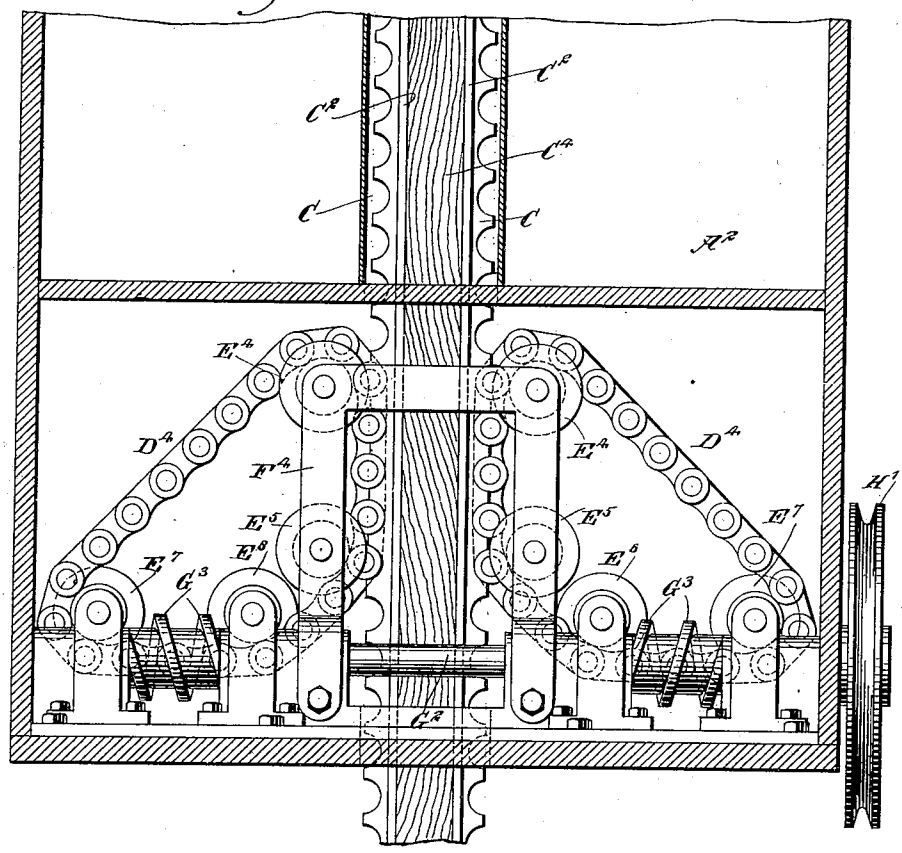
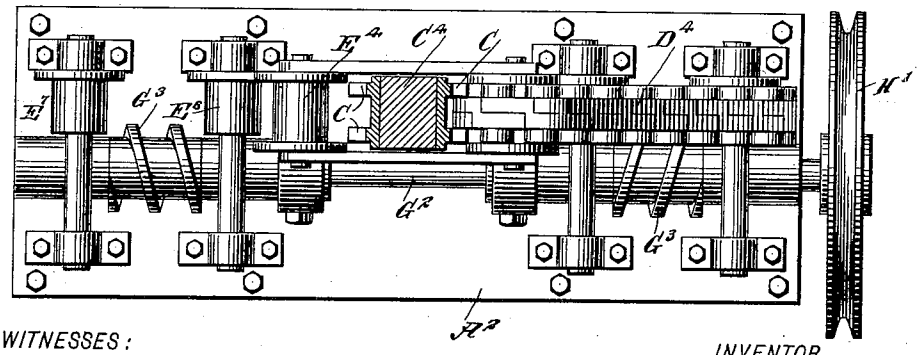


Fig. 6.



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DANIEL CORCORAN, OF YONKERS, NEW YORK.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 651,236, dated June 5, 1900.

Application filed January 2, 1900. Serial No. 118. (No model.)

To all whom it may concern:

Be it known that I, DANIEL CORCORAN, a citizen of the United States, and a resident of Yonkers, in the county of Westchester and State of New York, have invented a new and Improved Elevator, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved elevator which is perfectly safe when in use and positive in its ascending and descending movement by being always in gear and yet free to travel in the well or shaft.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the improvement with part in section. Fig. 2 is a transverse section of the same. Fig. 3 is an enlarged side elevation of the operating mechanism. Fig. 4 is a plan view of the same with the racks in section and one of the chains omitted. Fig. 5 is a side elevation of a modified form of the improvement; and Fig. 6 is a sectional plan view of the same, one of the chains being omitted.

The cage A is arranged to travel in a shaft or well B, between racks C, secured to posts C', extending from the bottom to the top of the well, as is plainly indicated in Figs. 1 and 2. The racks C are adapted to be engaged by a driving-gear located in the subcompartment A' of the cage A and consisting, essentially, of link chains D, each having rollers D' at its pivot-pins D^2, on which the links D^3 are pivoted, said rollers being adapted to mesh with the teeth of the racks C, as will be readily understood by reference to the drawings. As shown, a plurality of rollers D' are at a time in mesh with a corresponding number of teeth of the racks C, and in order to hold said number of rollers in mesh it is necessary for each of the chains D to pass over sheaves E E', located one above the over adjacent to the corresponding rack C, said sheaves being journaled in a frame F, pivoted at its lower end at F' to the framework of the compartment A'. Arms F^2 extend from the frame F and carry at their outer ends friction-rollers F^3, mounted to travel on the backs of flanges C^2, extending laterally from the racks C, so that the sheaves E E' are always held in proper position to bring a number of friction-rollers D' simultaneously in mesh with a corresponding number of teeth on the corresponding rack. Each chain D also passes under sheaves E^2 E^3, arranged one alongside the other and journaled in suitable bearings carried by the compartment A', and one or a plurality of the rollers between the said sheaves E^2 E^3 are adapted to be engaged by a worm G, secured on a shaft G', journaled in the compartment A' and carrying a grooved pulley H, over which passes a driving-belt I, also extending around idlers J J' to then pass over a pulley J^2 on the top of the well B and under a pulley J^3, secured on a shaft K, journaled on the bottom of said well. On the shaft K is secured a pulley L, connected by a belt L' with a pulley L^2 on a driving-shaft N, connected with suitable machinery for imparting a rotary motion to said shaft and causing the pulley L to rotate to impart a traveling motion to the belt I to rotate the pulley H. When the pulley H is rotated, a rotary motion is given to the shaft G' and the worms G, so that the latter successively engage the friction-rollers D' to impart a traveling motion to the chain D in a direction corresponding to the direction in which the shaft N is driven. Thus when the chains D are driven in the direction of the arrow *a'* the cage A is caused to ascend in the well, and when the chains are driven in the inverse direction of the said arrow *a'* the cage descends.

As illustrated in Figs. 5 and 6, a cage A^2 is mounted to travel on a single post C^4, extending through the middle of the cage, racks C being on opposite sides of the post and engaged by endless roller-chains D^4, the same in construction as those above described with reference to the chains D. The said chains D^4 pass over sheaves E^4 and E^5, journaled on a frame F^4 and serving to bring a plurality of friction-rollers at a time in engagement with a corresponding number of teeth on the rack C. Sheaves E^6 and E^7 are placed a sufficient distance apart to allow worms G^3 to

engage a plurality of friction-rollers to impart a traveling motion to the chains in either a forward or backward direction, according to the direction in which the shaft G^2, carrying the worms, is turned. On the shaft G^2 is secured a grooved pulley H', arranged at one side of the cage and engaged by a driving-belt I, as above explained with reference to Figs. 1 and 2.

As shown in the drawings, the racks are preferably made in double form, with friction-rollers at the outer end of each pin for engaging the double racks; but this construction is not essential.

In order to steady the up-and-down movement of the cage, rollers O are journaled on the top of the cage and travel on the inner faces of the flanges C^2.

The stopping and starting mechanism for the driving-gear is not illustrated and may be of any approved construction and under the control of an attendant of the cage.

It is evident that as soon as the shaft G' or G^2 ceases to rotate the chains D or D^4 cease to travel and are held from movement by their engagement with the worms G or G^3, so that there is no danger of the cage automatically descending unless the driving-gear is set in motion for the purpose. There is no danger of a sudden stop at the floor and a consequent smashing of the gearing, or even when descending rapidly, as the inertia of the pulley H or H' will prevent a sudden stopping of the shaft G' or G^2 and that of the worms G or G^3.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In an elevator, the combination of a fixed rack in the shaft or well, and an endless link chain mounted to travel in the cage, a portion of the chain being in mesh with said rack, to cause the cage to ascend or descend upon imparting a traveling motion to said chain in a forward or backward direction, substantially as shown and described.

2. In an elevator, the combination of a fixed rack in the shaft or well, an endless link chain mounted to travel in the cage, a portion of the chain being in mesh with said rack, to cause the cage to ascend or descend upon imparting a traveling motion to said chain in a forward or backward direction, and means carried by the cage for imparting a traveling motion to said link chain, as set forth.

3. In an elevator, the combination of a fixed rack, and a driven endless chain having rollers on its pivot-pins for engaging teeth on said rack, and driving means also engaging the rollers, for imparting a traveling motion to the chain, substantially as shown and described.

4. In an elevator, the combination of a fixed rack, a driven endless chain having rollers on its pivot-pins for engaging teeth on said rack, and driving means also engaging the rollers, for imparting a traveling motion to the chain, and means for holding a plurality of said rollers in simultaneous engagement with a corresponding number of teeth on the rack, substantially as shown and described.

5. An elevator, comprising a rack in the well, a driven endless link chain having rollers on its pivot-pins for engaging the teeth on said rack, sheaves over which passes said chain, a pair of said sheaves serving to engage a plurality of rollers with a corresponding number of teeth on the rack, and a driven worm-shaft having a worm in mesh with rollers between the other pair of sheaves, substantially as shown and described.

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

DANIEL CORCORAN.

Witnesses:
E. J. CROFT,
JAMES CARTER.