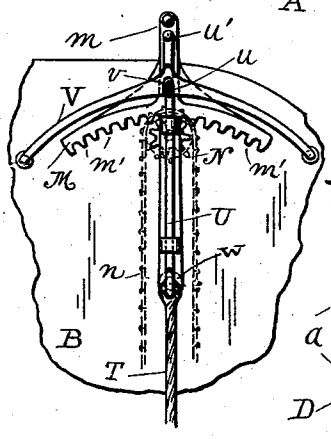
(No Model.) 2 Sheets—Sheet 1.

J. W. GENTRY.

ELEVATOR.

No. 548,752. Patented Oct. 29, 1895.

Fig. 4.



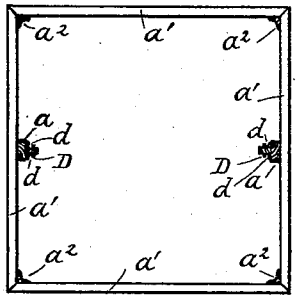


Fig. 2.

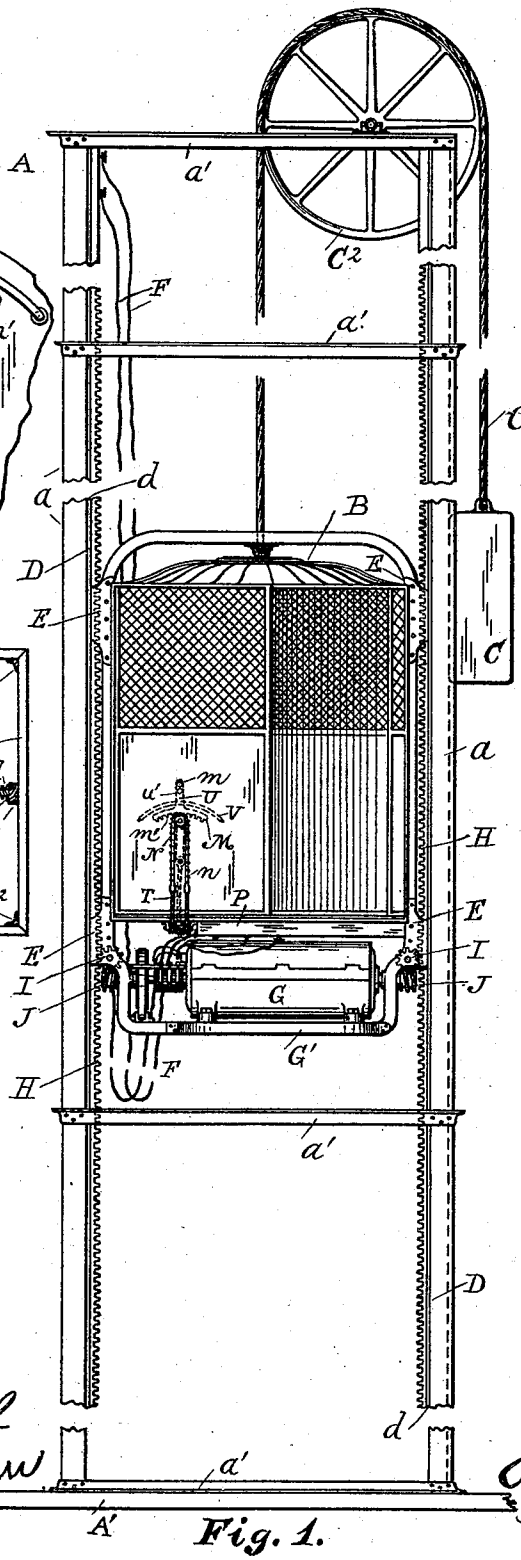


Fig. 1.

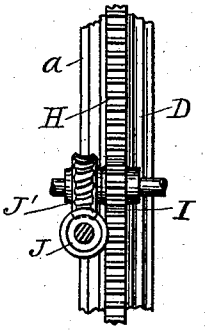


Fig. 3.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 6.

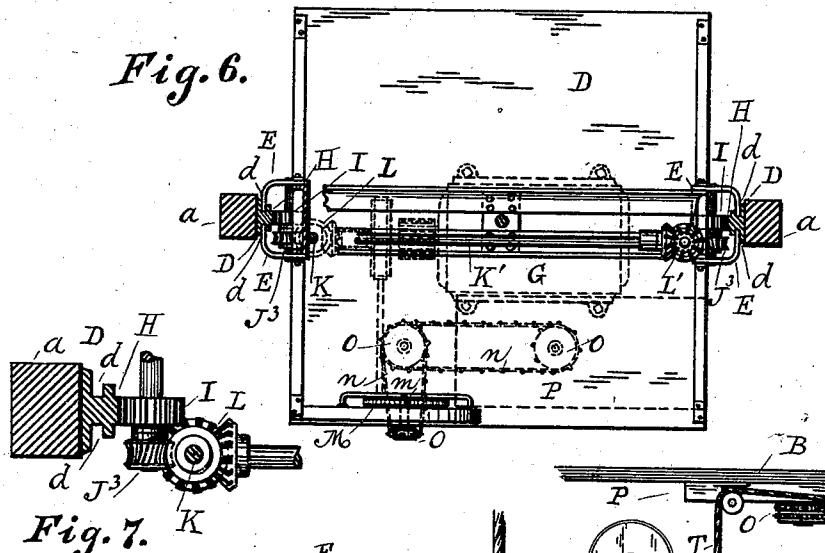


Fig. 7.

Fig. 8.

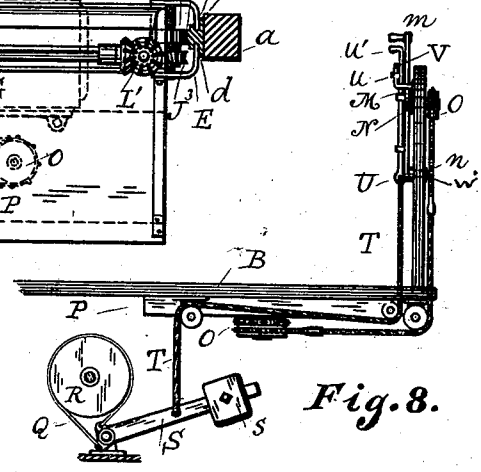
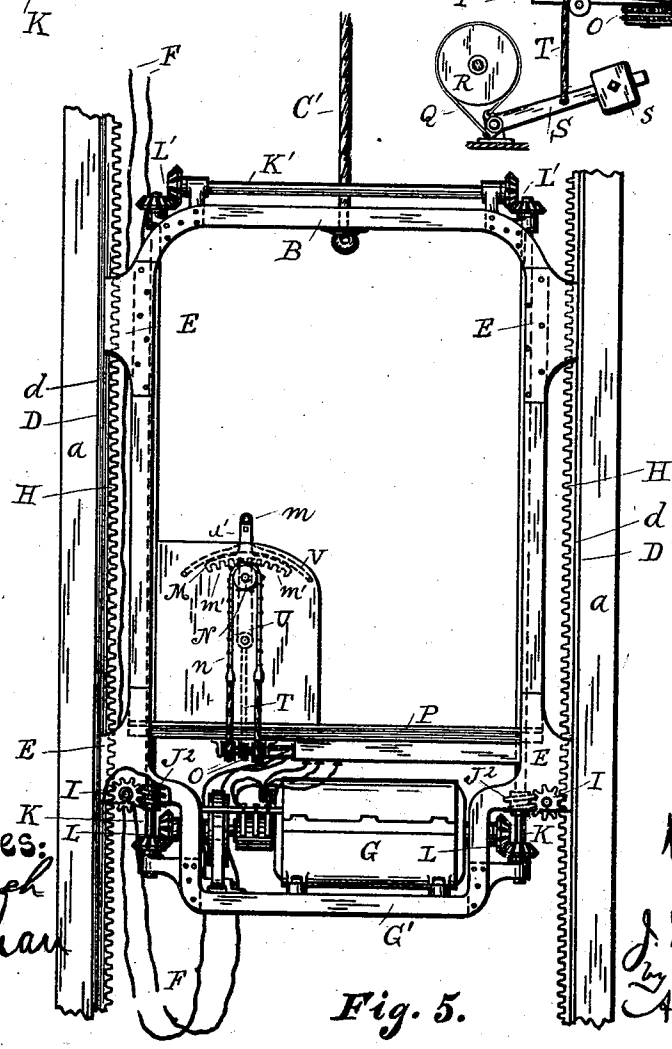


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN W. GENTRY, OF OAKLAND, ASSIGNOR OF ONE-HALF TO JEFFREY JACOB, OF FRUITVALE, CALIFORNIA.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 548,752, dated October 29, 1895.

Application filed January 21, 1895. Serial No. 535,722. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. GENTRY, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented certain new and useful Improvements in Elevators, of which the following is a specification.

My invention relates to improvements in apparatus employed for raising or lowering persons or freight from different levels or floors, and chiefly used in office buildings, hotels, warehouses, and the more important stores.

The object of my said improvements is to provide a simpler, cheaper, safer, better-controlled, more efficient, and durable elevator than has heretofore been devised and offered to the public.

Referring to the accompanying drawings, in two sheets, which form part of this specification, Figure 1 is a front elevation of a form of elevator built according to the principles of my invention and particularly adapted for passenger service. Fig. 2 is a sectional plan taken from the lower part of Fig. 1 and showing the improved shaft-frame, side timbers, and guides. Fig. 3 is a broken side elevation, on an enlarged scale, representing in detail part of the operating mechanism. Fig. 4 is another detailed view illustrating part of the working and stopping devices. Fig. 5 is a broken front elevation representing my improved elevator in a modified form, better adapted for carrying freight, and provided with safety-gearing. Fig. 6 is a plan of the construction shown at Fig. 5. Fig. 7 is an enlarged view of the guide and gearing seen on the left side of Fig. 6. Fig. 8 is a side elevation representing a corner of the elevator where the starting and stopping devices are located.

The letter A represents the outer frame, which is composed of side timbers a, surrounded by transverse pieces a', that are united and stayed at the corners by angle-iron plates a^2, the whole constituting a quadrangular skeleton shaft, within which the elevator car or cage is to travel. This frame is adapted to rest upon a foundation A', of stone, concrete, or brick, and is made so as to be wholly independent of the building where the elevator is to be set up, in order to avoid the jar so common in other constructions where fast-running elevators are used. Besides, having the shaft independent of its surroundings insures the smooth running of the cage at all times, even if the building should settle with age or from other causes.

B is the cage or car, which is inclosed, as usual, if used for carrying passengers and left open if merely intended to carry freight, both constructions being shown in the drawings. (See Figs. 1 and 5.) It is partly balanced by a weight C, suspended from the end of a rope C', fastened to its top and passing over a sheave C^2, located at the upper part of the skeleton shaft. It is maintained in position within the shaft by guides D, set upon the inner faces of the timbers a and provided with lateral grooves d, into which are fitted the ends of gripper-plates E, that project outwardly from the sides of the car or cage, the ends of said plates being suitably bent inwardly to enter the grooves and freely slide therein.

By preference the power employed for moving the elevator is electricity, which is obtained from an outside circuit and brought in by flexible wires F, properly insulated and connected with a motor G, placed under the elevator-platform and carried by a frame G', which keeps it suspended from the bottom of the car or cage, so that it may travel therewith. Any desirable form of electric motor may be used, that shown in the drawings being employed merely for purposes of illustration. It is deemed best to attach the upper ends of the wires F to the central part of the elevator-shaft, though for the sake of convenience they have been represented in Fig. 1 as being attached to the upper part of the shaft.

The hoisting mechanism consists of toothed racks H, located one on each side of the car or cage upon the guides D, pinions I, carried by the motor-frame and engaging said racks, and gears connecting said pinions with the armature-shaft of the motor. For passenger-elevators, where a fair running speed is one of the objects to be attained, it is deemed advisable to simplify the gearing as far as is practical, and consequently the gears used

consist merely of worms or endless screws J, formed upon the ends of the armature-shaft, and worm-gears J′, which are engaged with these worms and rigidly secured to the spindles that carry the pinions. The motion is thus transmitted directly and is more or less rapid, according to the intensity of the electric current supplied. In the case of freight-elevators, where solidity or fitness to carry heavy loads is more to be considered than speed, the gearing illustrated at Fig. 5 is believed to be preferable. Worms J^2 and worm-gears J^3 are used in this form of gearing also for actuating the pinions and causing the car or cage to climb up or down the racks; but the worms J^2 are carried by separate shafts K, that are set up vertically by the sides of the elevator and rotated by bevel-gears L from the ends of the motor-shaft. These shafts K are supplemented by a secondary shaft K′, laid transversely of the elevator, across the top of the car or cage, and driven from the upper ends of said shafts K by bevel-gears L′. The supplemental shaft K is provided to insure the safe running of the elevator in the event that one of the gears operated by the armature-shaft should fail to work properly. Both worms would then be actuated from the same end of the motor.

The starting apparatus or controller consists of a segmental rack M, provided with an upwardly-projecting handle *m* and having teeth *m′* on the under side, that mesh into and ride upon the teeth of a pinion N, adapted by means of suitably-guided chains *n* and interconnected spur-wheels O to operate a rheostat P, located above the motor, under the platform of the car or cage. The pinion N is journaled on the side of the car, and the controller is pivoted at its lower end to the side of the car, as shown at *w*. Pushing the handle to the right causes the elevator to ascend. Pushing it to the left causes the elevator to come down. Keeping it in a central vertical line stops the supply of the electric fluid, so that no current is used except when the elevator is in operation. By preference a double rheostat is used.

With the controller is connected a brake mechanism consisting of a friction-band Q, passed over a disk R on the motor-shaft and tightened by a lever S, which is actuated through the medium of a rope T, fastened at one end to said lever and at the other to a lifter U, arranged to swing to and fro with the controller-handle and rack under a stationary arc, guide, or stop V, secured to one side of the cage or car. A notch *v* in the under side of this guide or stop, adapted to receive a projection *u* on the lifter, allows the latter to be raised to work the brake only when the controller is centered and the electric current is shut off. A handle *u′* furnishes the means for raising the lifter into the notch *v*. A weight *s* on the lever S slackens the band Q and releases the motor-shaft upon the lifter being allowed to drop down.

Among other advantages possessed by my improved elevator may be cited its simplicity of construction, the comparatively low cost at which it can be built, the positive movement insured for it at all times by its own structure and that of the shaft in which it is fitted, the ease with which it can be controlled while in motion, the economy in power effected by it, and the absolute safety which it affords.

Having now described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. The combination of a car or cage, a motor carried thereby and moving the same, a friction brake acting on the shaft of said motor, a controller connected with the motor to determine the direction of rotation of the motor shaft, a lifter carried by said controller and connected with the brake, and a guide or stop bearing on said lifter and having a central notch, substantially as and for the purposes set forth.

2. The combination of a car or cage, a motor carried thereby and moving the same, and a controlling device for said motor consisting of a pinion mounted on the side of the car, intermediate gearing connecting said pinion with the motor, and a segmental rack pivoted on the side of the car and meshing with said pinion.

3. The combination of a car or cage, a prime mover carried thereby, upright shafts also carried by said car or cage and geared at one end with said prime mover, vertical racks, worms on said shafts geared with said racks, and a supplementary transverse shaft geared with the opposite end of said upright shafts, substantially as set forth.

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

J. W. GENTRY.

Witnesses:
JEFFREY JACOB,
A. H. STE. MARIE.