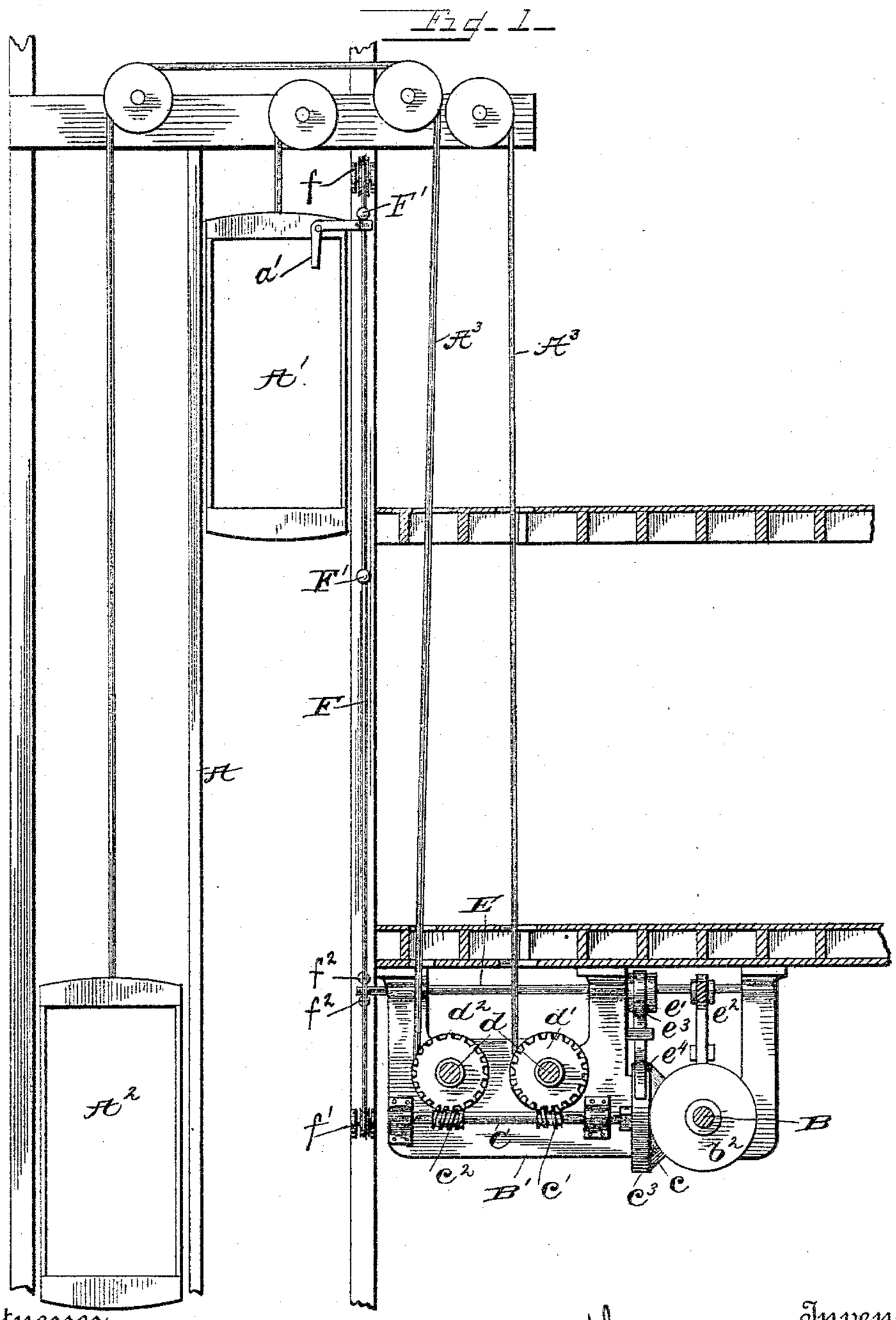
(No Model.) 3 Sheets—Sheet 1.

W. W. DINGEE.

ELEVATOR.

No. 414,380. Patented Nov. 5, 1889.

Fig. 1.



Witnesses

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By his Attorneys

Whitaker & Prout

(No Model.) 3 Sheets—Sheet 2.

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Fig. 2.

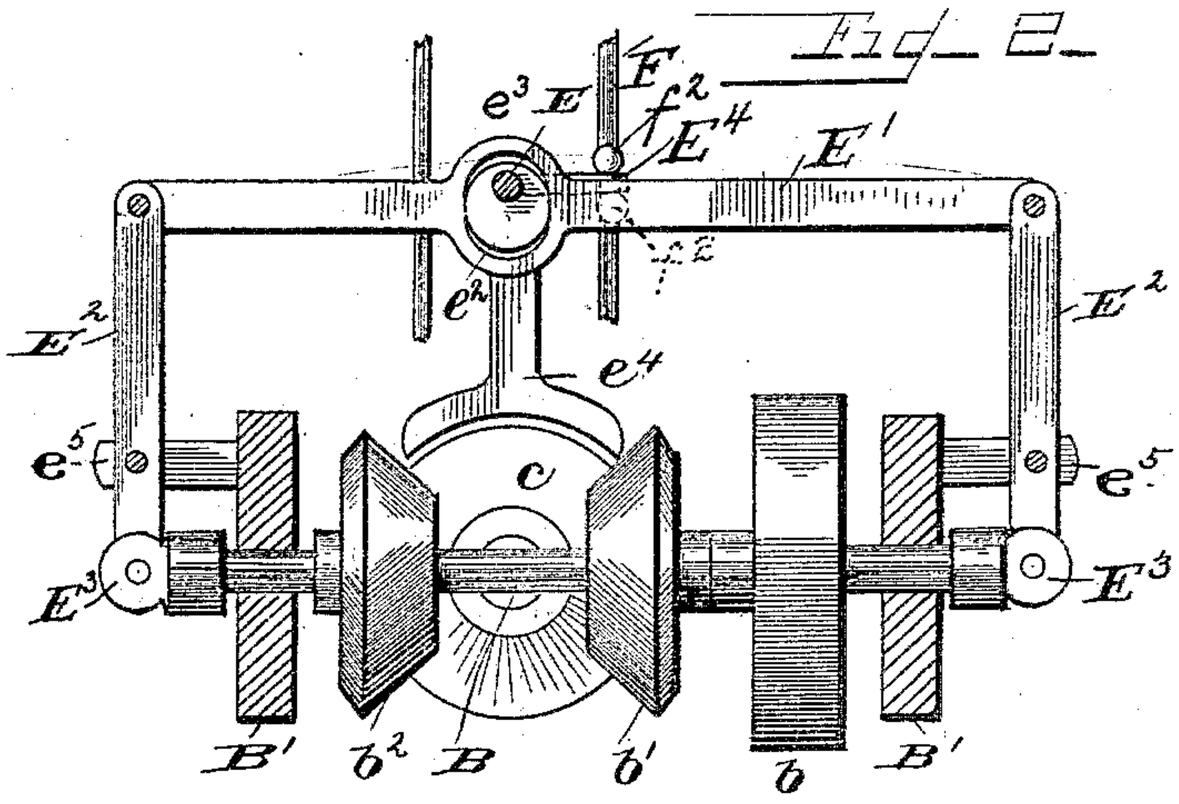
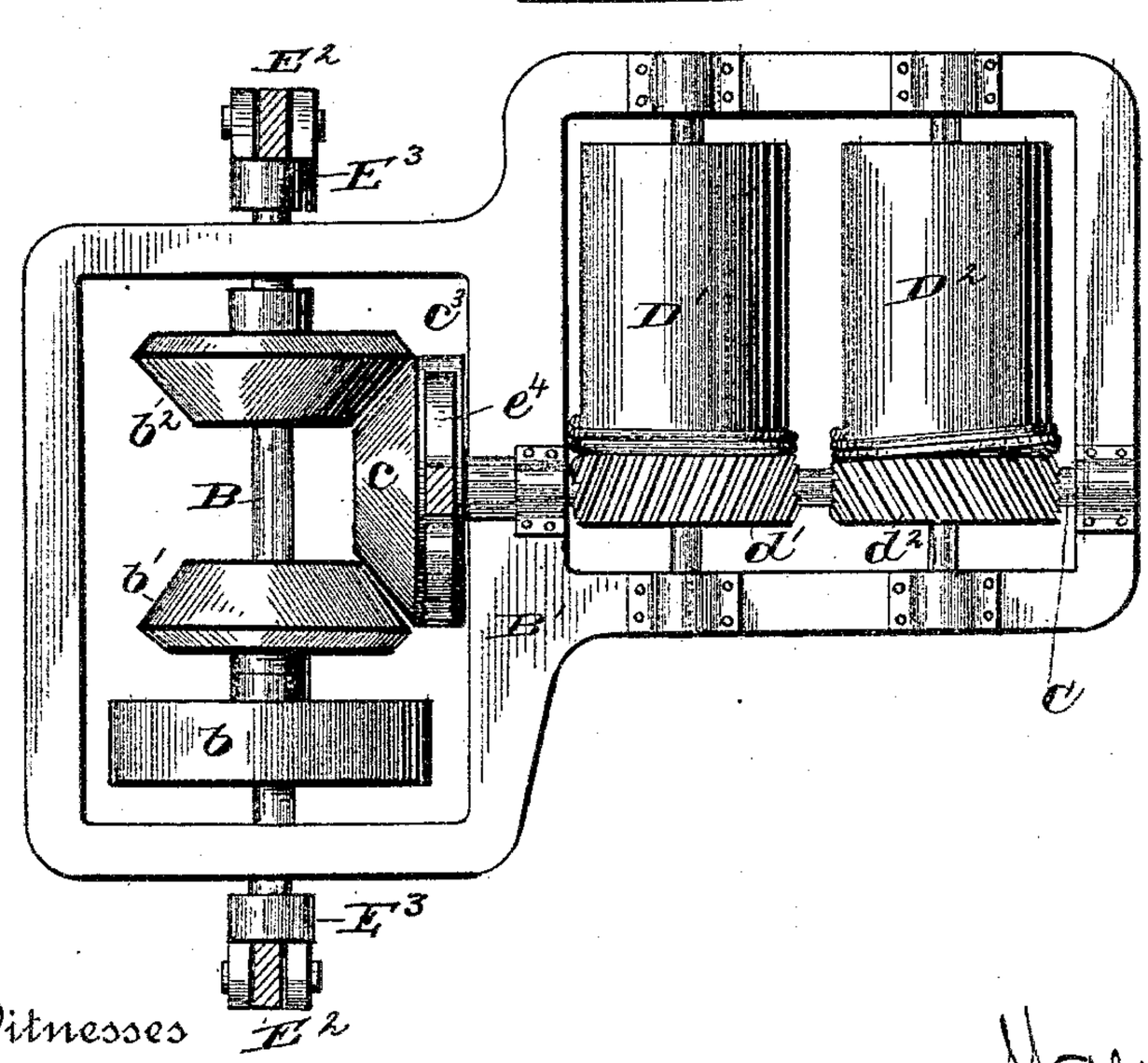


Fig. 3.



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(No Model.) 3 Sheets—Sheet 3.

W. W. DINGEE.

ELEVATOR.

No. 414,380. Patented Nov. 5, 1889.

Fig. 4.

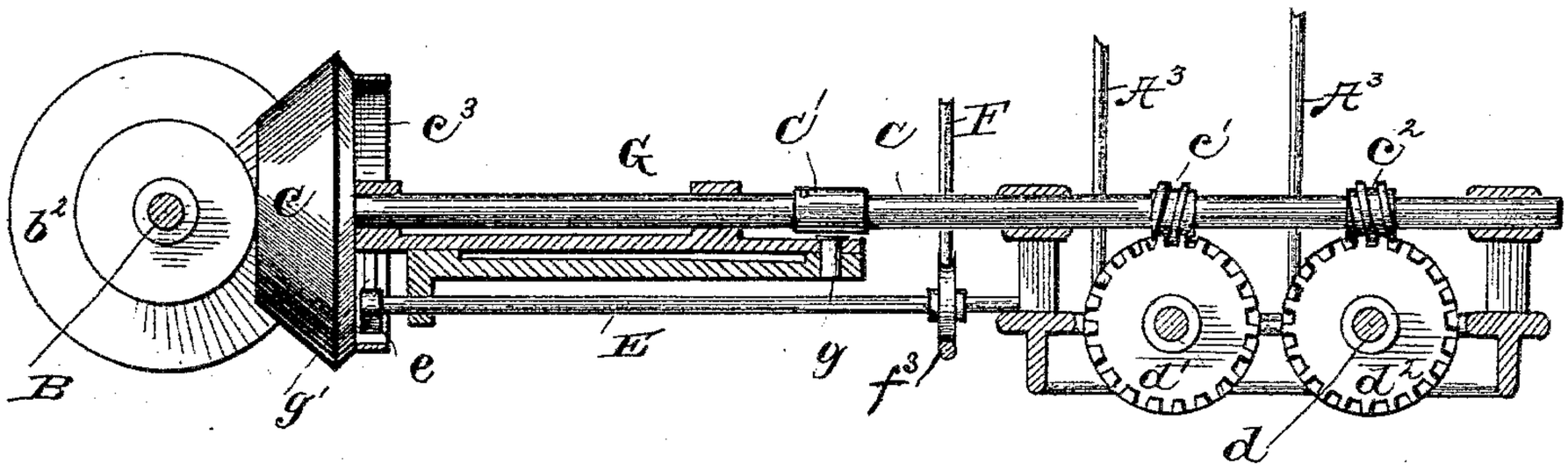


Fig. 5.

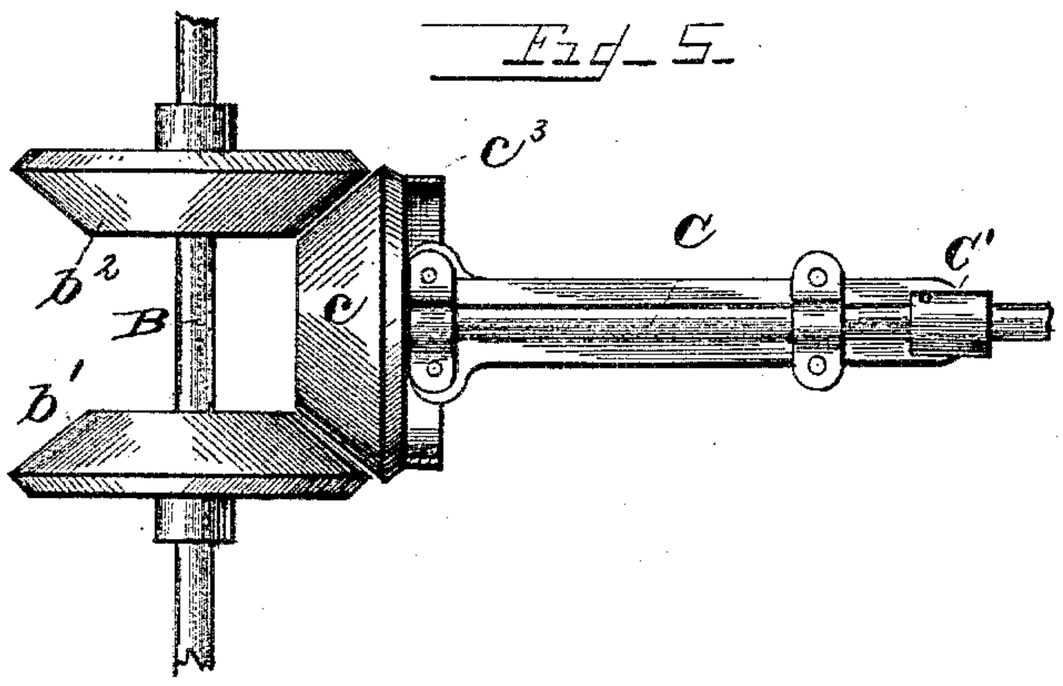


Fig. 6.

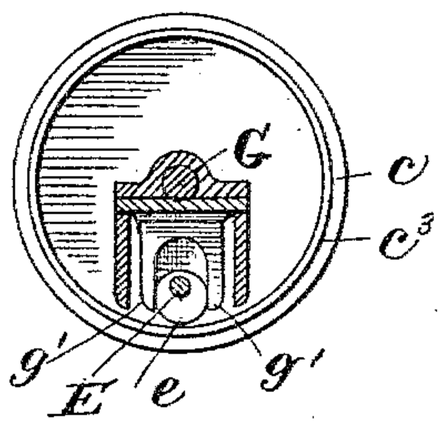
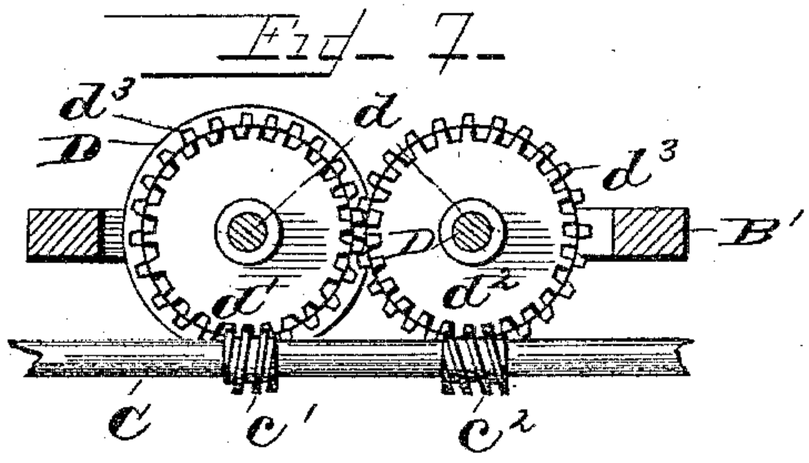


Fig. 7.



Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM W. DINGEE, OF RACINE, WISCONSIN.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 414,380, dated November 5, 1889.

Application filed June 21, 1889. Serial No. 315,108. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. DINGEE, a citizen of the United States, residing at Racine, in the county of Racine and State of Wisconsin, have invented certain new and useful Improvements in Elevators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to elevators; and it consists in certain novel features of construction and combination of parts, whereby the entire elevating machinery is disconnected from the power mechanism and rendered inoperative when the elevator is stationary and other desirable results in the operation of the apparatus secured.

I have illustrated my invention in the accompanying drawings, and have fully disclosed the same in the following specification and claims.

Referring to the said drawings, Figure 1 represents an elevator-well passing through two or more floors, showing a duplex elevator system and the machinery for operating the same. Fig. 2 is a view of a part of the apparatus, showing the construction for reversing the direction of the machinery and the brake for stopping the same. Fig. 3 is a plan view of the elevating mechanism with the shipping device removed. Fig. 4 represents a slightly-modified construction. Figs. 5 and 6 are detail views of parts of the same. Fig. 7 is a modification of the construction for operating the winding-drum.

In Fig. 1 I have represented an elevator shaft or well provided with a dual system of elevator-cars; but it is obvious that the devices herein described may be used as well in single systems by employing counterbalance-weights.

In the drawings, A' A^2 are the elevator-cars, which are suitably constructed to move vertically in the double elevator shaft or well A. The machinery for raising and lowering the cars is preferably located beneath one floor of the building, and it is convenient to operate it from line-shafting located beneath said floor. This arrangement is especially advantageous in factories and mills. In ordinary buildings the driving-shaft will be connected with a suitable motive power for imparting motion to the same.

The driving-shaft B is journaled in bearings in a frame B′, which preferably is of such size and shape as to support all the parts of the mechanism, and said shaft B is arranged to have a slight movement longitudinally of the same. Upon the driving-shaft are rigidly secured a band-pulley b and two oppositely-beveled friction-wheels b' b^2 at a suitable distance apart. A counter-shaft C is suitably journaled perpendicular to the driving-shaft and is provided at one end with a beveled friction-pulley c, which is adapted to receive motion from either of the pulleys b' b^2, as the one or the other is forced into engagement therewith by moving the shaft B in its bearings. The shaft C is also provided with two oppositely-pitched worms c' c^2, which engage with worm-wheels d' d^2 and impart motion to shafts d d, on which are secured the winding-drums D′ D^2. To these drums are attached the wire or other ropes A^3, which are connected with the elevator-cars A' A^2 in such a manner that one of the drums will be rotated to wind up its rope and raise one car, while the other will unwind its rope and lower the other car or the counter-balance employed in lieu thereof. By employing two worms of opposite pitch the strain on the shaft C is reduced to the minimum, and when the elevator is at rest the weight of the two cars, acting through the drums on said worms, will not tend either to rotate the shaft C or to strain the same by throwing it endwise, as would be the case were only one worm employed.

In Fig. 7 I have shown a construction which I may employ and which is especially advantageous where a single car is used. In this case one of the drums is dispensed with and the shafts d d provided with intermeshing pinions or gears d^3 d^3. A single drum D is mounted upon one of the shafts d, and the motion of the screws c' c^2 will be imparted to the drum D equally by the gears d^3 d^3.

The frame or casing B′ for the machinery is secured below one floor of the building by

means of hangers B^2, which are bolted or otherwise secured to said floor. It is obvious, however, that the frame or casing might be supported upon the floor or in any other suitable manner, if desired.

A shaft E is supported in bearings above or below the main frame, (here shown above,) and is provided with two eccentrics e' e^2. One of these eccentrics is provided with a strap e^3, to which is attached a brake-shoe e^4, which is adapted to engage the outer face of an annular flange or rim c^3 on the rear face of the friction-pulley c. The brake-shoe may, if preferred, however, be located in such manner as to engage the inner face of the flange or rim. By rotating the shaft E and eccentric e' the brake-shoe e^4 may be thrown into and out of operation.

The eccentric e^2 engages a recess formed in the center of an arm E′ and operates to move the shaft B longitudinally and stop or reverse the motion of the machinery. To this end levers E^2 are suitably pivoted in projections E^5 from the main frame, and one end of each of said levers is pivoted to the arm E′. The free ends of levers E^2 are pivotally connected to cup-boxes E^3, which engage the ends of the shaft B. The parts are shown so arranged that when the eccentric is in the position shown in the drawings, Fig. 2, the wheels b' b^2 will be out of engagement with the friction-wheel c. A movement of said eccentric in one direction will bring the wheel b' into engagement with wheel c, and a movement in the opposite direction will bring wheel b^2 into engagement with wheel c, while at any point the returning of the eccentric to the position shown in the drawings will release the wheel c from both of the wheels b' b^2.

The shaft E and the brake and shipping mechanism are operated by means of an endless rope F, of wire or other suitable material, which passes over the pulleys f and f', located adjacent to the top and adjacent to the bottom of the shaft A. One part of this rope is connected to the shaft E, preferably by means of an actuating-lever E^4, through which said rope extends, the rope being provided above and below the said lever with an enlarged portion, as a ball f^2, secured thereto for actuating the said lever. I may, however, locate a pulley f^3 on the shaft E and pass the rope F over it in such a manner as to actuate said shaft. One of the vertical portions of said rope F passes up the shaft A adjacent to the elevator-car A, or, if desired, it may pass through apertures in the same and be accessible from the interior of the car. I have shown the rope F as extending vertically outside of the car, and in such cases the machinery will ordinarily be controlled by an operator standing on one of the floors adjacent to the well.

In order to make the controlling of the actuating mechanism automatic, I may locate enlarged portions in the form of balls or blocks F′ upon the rope F at proper intervals and provide the car A′ with an arm a', having a slot in the same through which the rope F passes. Where it is desirable to stop the elevator-car at the top or bottom floors automatically, I locate balls F′ adjacent to such floors. When the machinery is started and the car is set in motion, it will be raised or lowered, as the case may be, until the arm a' strikes one of the balls F′, thereby actuating the rope F and by means of the eccentrics on shaft E throwing the driving-shaft out of gear with the friction-wheel c and applying the brake, thereby stopping the movement of the car. I prefer to attach the arm a' to the car in such a manner that it may be thrown out of engagement with the rope F when desired. In such case, where there are a large number of floors, I may provide the rope F with a ball F′ adjacent to each floor, and the arm a' may be thrown out of engagement with the rope and operated in the ordinary manner, or it may be thrown into engagement with said rope and stopped automatically at any desired floor.

In Figs. 4, 5, and 6 I have shown a slightly-modified form of brake and shipping device. In this instance the shaft B is not movable longitudinally and the counter-shaft C is provided with a joint at C′, which enables the pulley c and the portion of the shaft adjacent thereto to be moved laterally to bring said pulley into engagement with one or the other of the pulleys b' b^2. The movable portion of the shaft C is mounted in bearings secured to a plate G, which is pivoted at g to the supporting-plate H, and said plate G extends within the transverse plane of the rim or flange c^3. The plate G is provided with two depending lugs g' g', which engage an eccentric e on a shaft E, which is actuated by means of the rope F, passing around a wheel f^2 on said shaft. By means of the eccentric e and lugs g' the plate G may be moved laterally to effect the stopping or reversing of the motion of the car.

I may provide a brake-shoe adapted to bear upon the inner face of the flange c^3 and arranged to be operated by the eccentric e, if desired, as shown in Figs. 4 and 6, or I may construct the parts in such manner that the face of the eccentric e may be brought to bear upon said rim, and thus form a brake.

What I claim, and desire to secure by Letters Patent, is—

1. In an actuating mechanism for elevators, the combination, with the driving-shaft provided with two opposite friction-gears, of a counter-shaft provided with a friction-gear adapted to engage with either of said driving-gears, worms on said counter-shaft, winding-drums adapted to be rotated by said worms, and means for moving one of said shafts to throw one or the other of the driving-gears into engagement with the gear on the counter-shaft, substantially as described.

2. In an actuating mechanism for elevators,

the combination, with the driving-shaft provided with two oppositely-beveled friction-gears, of a counter-shaft provided with a beveled friction-gear, worms on said counter-shaft, winding-drums adapted to be rotated by said worms, and means for moving the driving-shaft longitudinally to throw one or the other of its gears into engagement with the gear on the counter-shaft, substantially as described.

3. In an actuating mechanism for elevators, the combination, with a driving-shaft provided with two oppositely-beveled friction-gears, of a counter-shaft provided with a friction-gear adapted to be engaged by either of said driving-gears, worms of opposite pitch on said counter-shaft, a winding drum or drums, worm-wheels engaging said worms, and means for moving the driving-shaft longitudinally, substantially as described.

4. In an actuating mechanism for elevators, the combination, with the driving-shaft adapted to slide in its bearings and provided with two oppositely-beveled friction-gears, of a worm-shaft provided with two worms of opposite pitch and having a beveled friction-gear adjacent to said driving-gears, winding-drums provided with worm-wheels engaged by said worms, an eccentric, and connections between said eccentric and the driving-shaft, whereby the driving-shaft may be moved longitudinally, substantially as described.

5. In an actuating mechanism for elevators, the combination, with the driving-shaft adapted to slide in its bearings on the main frame and provided with two friction-gears, a counter-shaft provided with a gear adapted to engage either of said friction-gears, worms on said counter-shaft, a drum or drums, and worm-wheels engaged by said worms, of the shipping mechanism for the driving-gears, consisting of an eccentric, a rod adapted to be moved by said eccentric, and levers pivoted to the main frame, each having one end connected to the said rod and the other provided with a cup-bearing engaging the end of the driving-shaft, substantially as described.

6. In an actuating mechanism for elevators, the combination, with the driving-shaft having two gears thereon, of a counter-shaft having a gear adapted to be engaged by either of said driving-gears, worms on said counter-shaft for operating the winding-drums, a shipping device for controlling the movement of the counter-shaft, an eccentric mounted on a supplemental shaft for operating said shipping device, a brake, and another eccentric on said supplemental shaft for operating said brake, and a rope or wire for actuating said supplemental shaft, substantially as described.

7. In an actuating mechanism for elevators, the combination, with the driving-shaft sliding in its bearings and having two gears thereon, of a counter-shaft provided with a gear adapted to be engaged by either of said driving-gears, a winding drum or drums, worm-wheels engaged by worms on the counter-shaft, a shipping device for moving said driving-shaft, and a brake for said counter-shaft, a supplemental shaft for controlling the shipping device and brake, a shipping-rope connected to said supplemental shaft having enlarged portions thereon, and an elevator-car provided with an arm adapted to engage the said enlarged portion, whereby the said brake and shipping device are automatically controlled, substantially as described.

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

WILLIAM W. DINGEE.

Witnesses:

CHARLES H. LEE,

JNO. H. MINER.