(No Model.) 2 Sheets—Sheet 1.

C. W. BALDWIN.

ELEVATOR.

No. 456,106. Patented July 14, 1891.

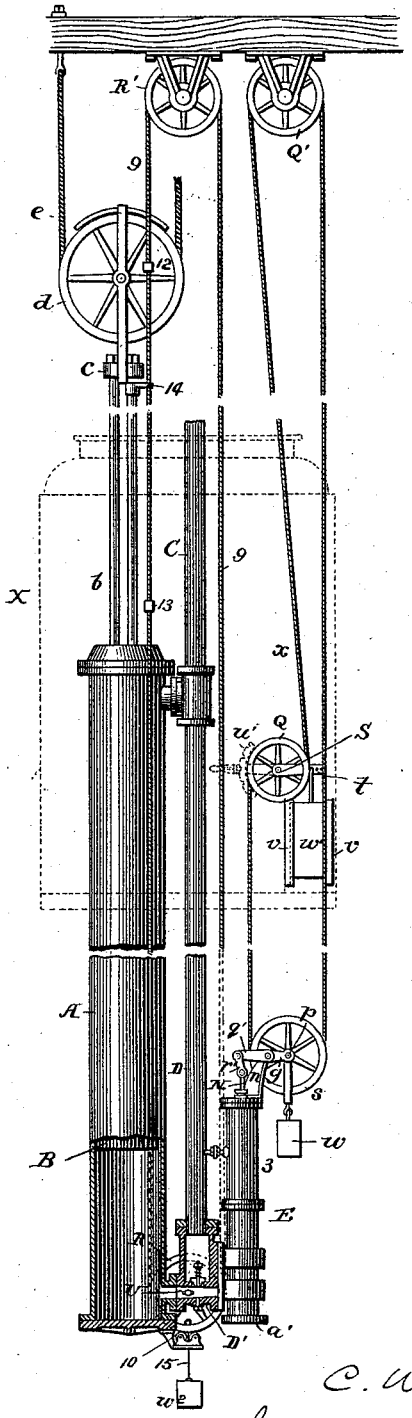

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

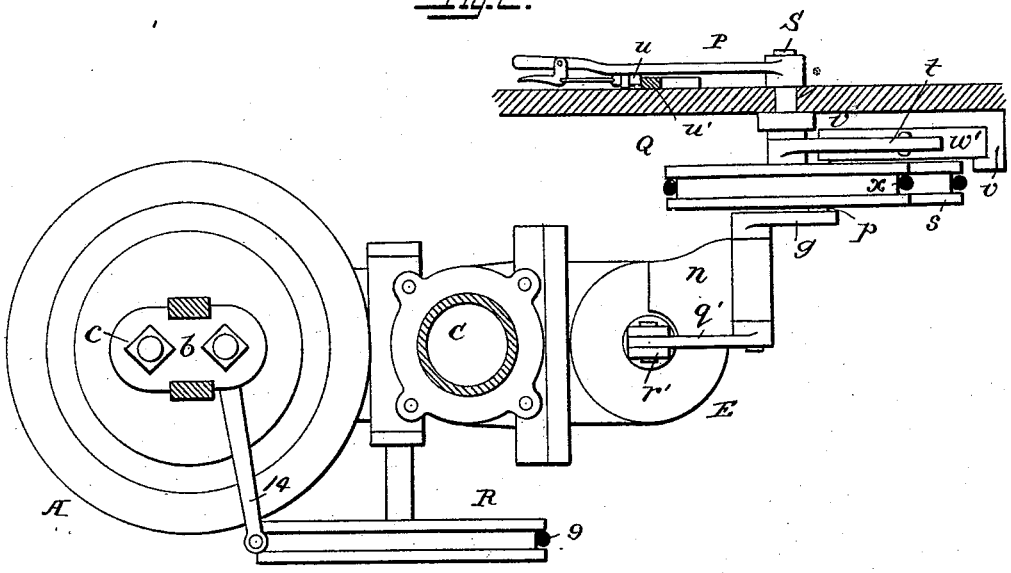


Fig. 3.

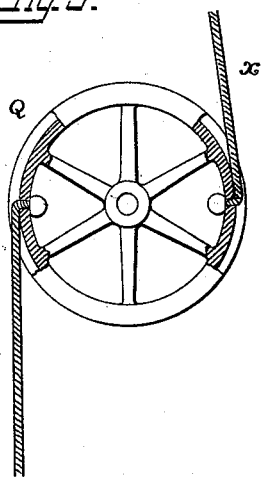
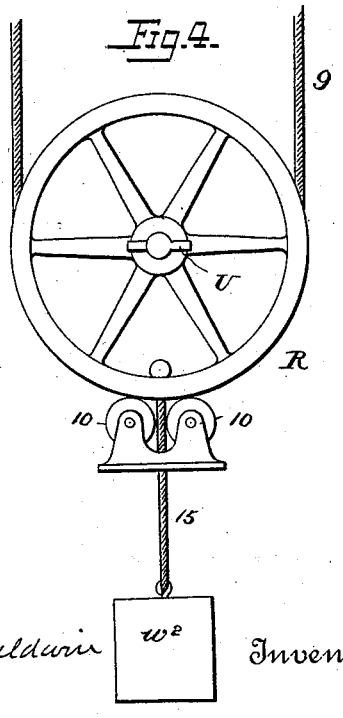


Fig. 4.



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UNITED STATES PATENT OFFICE.

CYRUS W. BALDWIN, OF YONKERS, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE NATIONAL COMPANY, OF ILLINOIS.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 456,106, dated July 14, 1891.

Application filed April 17, 1885. Serial No. 162,593. (No model.)

To all whom it may concern:

Be it known that I, CYRUS W. BALDWIN, a citizen of the United States, residing at Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Hydraulic Elevators, of which the following is a specification.

My invention has for its object to facilitate the manipulation of the controlling devices of elevating-engines; and it consists in certain connections between the valve-stem of the main valve of the operating-engine and the cage, whereby the desired result may be effected, the connections also being such that any variation in the length of the operating-rope will not result in any improper adjustment of the controlling-valve of that class of engine in which traveling cables are desired.

My invention further consists in a construction of devices, set forth hereinafter, for automatically retarding the flow of water as the cage approaches the limit of its movement in either direction.

In the drawings, Figure 1 is an elevation in part section of a hydraulic elevator illustrating my improvements. Fig. 2 is an enlarged plan, in part section, of Fig. 1. Fig. 3 is a detached sectional view of the cable-operating wheel upon the car. Fig. 4 is a detached view of the device for actuating one of the valves.

A is the cylinder of a hydraulic elevating-engine, which cylinder is provided with a piston B, one or more piston-rods *b*, and cross-head *c*, carrying the sheave *d*, around which passes the cable or flexible suspensory *e*, one end of which is fixed, while the other will in practice be attached to the cage X (shown in dotted lines) in any usual manner.

C represents the inlet-pipe by which water under pressure is conducted from any suitable reservoir to the cylinder.

D D′ are the circulating-pipes, through which the water may circulate from the upper to the lower end of the cylinder, passing through a valve-casing E, which is provided with a valve of any suitable construction and with a discharge-port at *a*.

The operation of the valve is the same as in usual devices of this character, the valve device illustrated in external elevation in Fig. 1 preferably being similar to that set forth in Letters Patent No. 352,797, issued to me November 16, 1886.

It will not be necessary to specify more particularly the construction of the parts above referred to, as they are well known and have been represented only for the purpose of illustrating my invention, which has for its object to facilitate the movement of the controlling-valve, and which invention can be employed not only with elevating-engines of the construction above described, but with others in which the movements of the power-piston are regulated by the adjustment of a large valve.

Upon the head of the valve-casing E is mounted an arm *n*, in which turns a shaft *p*, carrying two arms *g g′*, the latter being connected by a link *r′* to the upper end of the stem N of the auxiliary valve, and the arm *g* carries a grooved pulley *s* and a pendent weight *w*.

In a bearing upon the side of the cage turns a shaft S, extending through the cage and provided at the inner end with a lever or handle P, and carrying a lever or pulley Q, fixed to the outer end, and also an arm *t*, from which hangs a weight *w′*, moving vertically between guides *v* upon the cage. A rope or cable *x* is fastened to the periphery of the pulley Q at one end, passes over a guide-pulley Q′ at the top of the well, and down around the pulley *s*, and is secured at the opposite end to the rim of the pulley Q, as shown in Fig. 2. The lever P is provided with a hand-bolt *u*, Fig. 2, which engages with a notched segment-plate *u′*, carried by the cage, whereby the lever may be held in any position to which it is set and readily unlocked from the segment when it is seized, in order to reset it. As the cage travels upward the rope *x*, connected with the cage by its attachment at the ends to the opposite sides of the pulley Q, travels around the pulleys Q′ *s* without affecting the position of the valve devices; but the valve-stem N may be raised or lowered at any point of the travel of the cage by moving the hand-lever P up and down, so as to wind the rope upon or unwind it from the pulley Q, the former action shortening the loops of rope and raising the pulley *s* and throwing downward

the stem N, while the depressing of the hand-lever slacks the rope, so that the weight *w* will carry the pulley *s* down and cause the stem N to be elevated. The weight *w'* serves to counterbalance the weight *w* and reduce the labor of the attendant in raising the weight *w* to depress the valve, while when the weight *w* is raised the weight *w'* acts forcibly to lift the valve.

It will be seen that the connection between the cage and valve device above described will not be permanently affected by the stretching of the rope, inasmuch as a slight adjustment of the hand-lever will always suffice to compensate for any lengthening, while the rope is at all times retained taut. It, by the weight *w*, should be understood, however, that the parts are so proportioned that the weight *w'* cannot itself lift the pulley *s*, but simply counterbalances the latter.

In case the rope *x* or the handle or other part of the valve-operating device should break or become inoperative, I provide means whereby the discharge or circulation of water is prevented when the cage approaches the limit of its movement in either direction, thereby gradually but positively arresting such movement. To effect this I place a safety-valve U in some portion of the circulating channel—for instance, in the pipe D'—and with this valve I combine stops or tappets arranged to be struck by a traveling projection—as, for instance, a projection upon the piston-rod—and connections whereby the movements thus imparted to the tappets may be transmitted to the valve to close the passage. Different connections may be used for this purpose. Those shown consist of the pulleys R R', the former secured to the stem of the valve U (see Figs. 1 and 4) and the latter supported by a bracket at the top of the well, and an endless cord 9, passing around both pulleys, is provided with stops 12 and 13, arranged in position to be struck by an arm 14 upon the piston-rod *b* as the cage approaches the limit of its movement in different directions.

The pulley R is weighted so as to normally occupy a position to keep the valve U parallel with the passage in the pipe D', one means of thus weighting the pulley being to connect a cord 15 to the periphery and extend the cord between two rollers 10 10 and attach a weihgt w^2 to the lower end. When the arm 14 strikes either the stop 12 or the stop 13, the cord 9 will be carried with the said arm, and the pulley R will be turned so as to gradually turn the valve U in the passage and as gradually retard the flow of the water and the movement of the cage.

Any of the various well-known means may be employed for operating the valve U from the cage. For instance, the rope 9 may pass through the cage like the ordinary hand-rope.

I do not here claim, broadly, the use of means for adjusting the valve U as the cage approaches the limit of its movement in either direction, as the same forms the subject of Letters Patent No. 390,052, September 25, 1888.

I do not in this application claim, broadly, the combination of the car, traveling cable, guide-pulleys, hand device upon the car for contracting and lengthening the cable, and valve and connections with the cable, nor a weight for moving one of the guide-pulleys of the operating-cable in one direction, as these are the subjects of another application for Letters Patent Serial No. 179,543, filed October 10, 1885.

Without limiting myself to the precise construction and arrangement of parts shown and described, I claim—

1. In an elevator, a cage, a rope secured at its ends to a pulley to travel with the cage and extending over a pulley at the top and around a pulley at the bottom of the well, and connections for operating the valve, substantially as set forth.

2. In an elevator, a stopping and starting device, a cage carrying a pulley, and a traveling cable for shifting the stopping and starting device connected with said pulley at opposite sides of the center thereof, substantially as set forth.

3. In an elevator-cage, a pulley on the outside of the cage, a stopping and starting device, and a cable connected with said device and also with said pulley, and means for turning the pulley from within the cage, substantially as set forth.

4. The combination, with the valve and cage of an elevator, of a pulley *s*, turning in vertically-movable bearings connected with the valve-stem, a guide-pulley Q' at the top of the well, a pulley Q, carried by and arranged outside of the cage to be turned from within the latter, and a rope passing to opposite sides of the pulley Q and connected therewith and passing around the pulley Q' and pulley *s*, substantially as described.

5. The combination, with the valve-operating pulley *s*, the pulley Q, carried by and arranged to be operated from within the cage, and with the rope supported within the well and connected to the pulley Q, of a weight connected with the pulley Q to turn the latter and maintain the rope taut, substantially as set forth.

6. The combination of the cage, the stopping and starting device, and cable connected with the said device, operating means on the cage connecting with the said cable, a weight connected to move said device in one direction, and a counter-weight connected with the operating means on the cage, substantially as described.

7. The combination, with the cage, stopping and starting device, and traveling cable, of a lever upon the cage connected with the cable, and means for securing said lever in different positions, substantially as set forth.

8. The combination of the valve U, weighted pulley connected to the stem of the safety-

valve, guide-pulley at the top of the well, an endless rope passing round both pulleys and provided with stops, and the traveling arm arranged to make contact with one of the stops as the cage approaches the limit of its movement in either direction, substantially as described.

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

CYRUS W. BALDWIN.

Witnesses:
M. S. KEYES,
E. R. KEYES.