(No Model.)

H. A. BEIDLER.

DEVICE FOR CONTROLLING ELEVATORS.

No. 420,760. Patented Feb. 4, 1890.

Fig. 5.

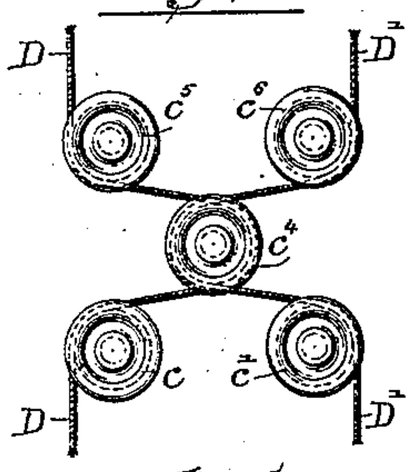


Fig. 6.

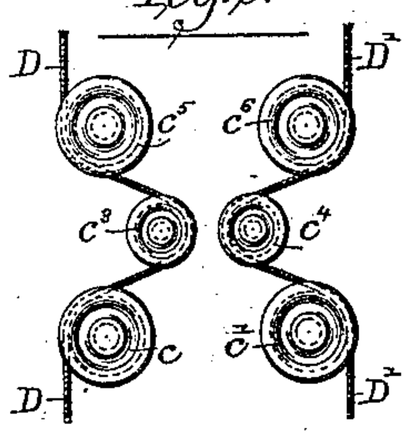


Fig. 1.

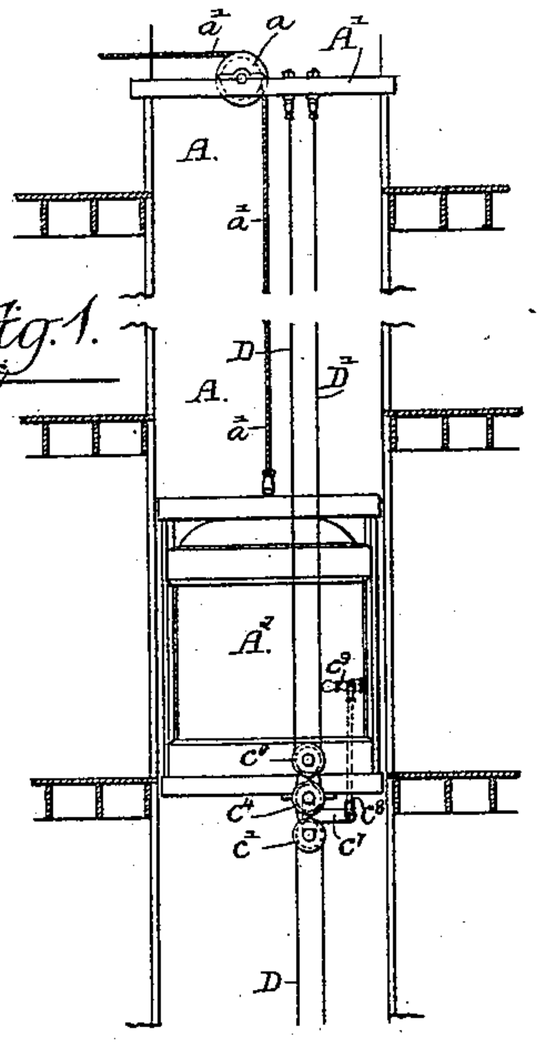


Fig. 4.

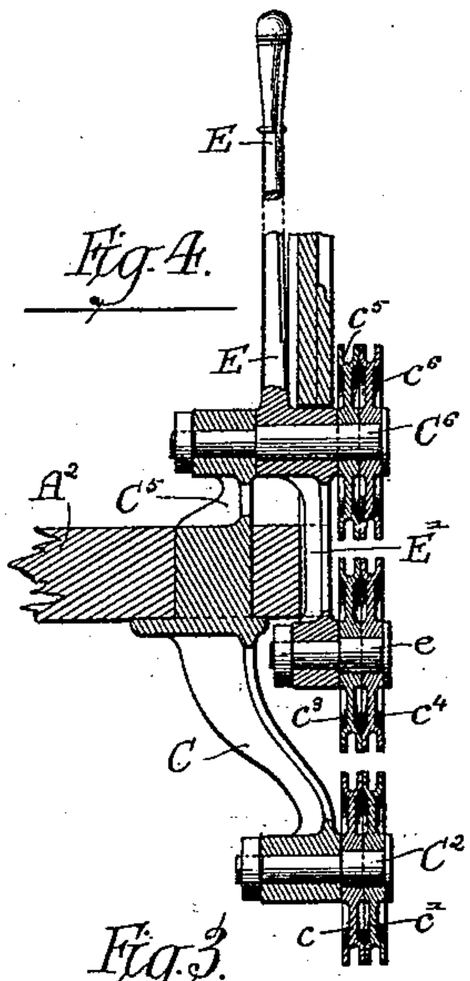


Fig. 3.

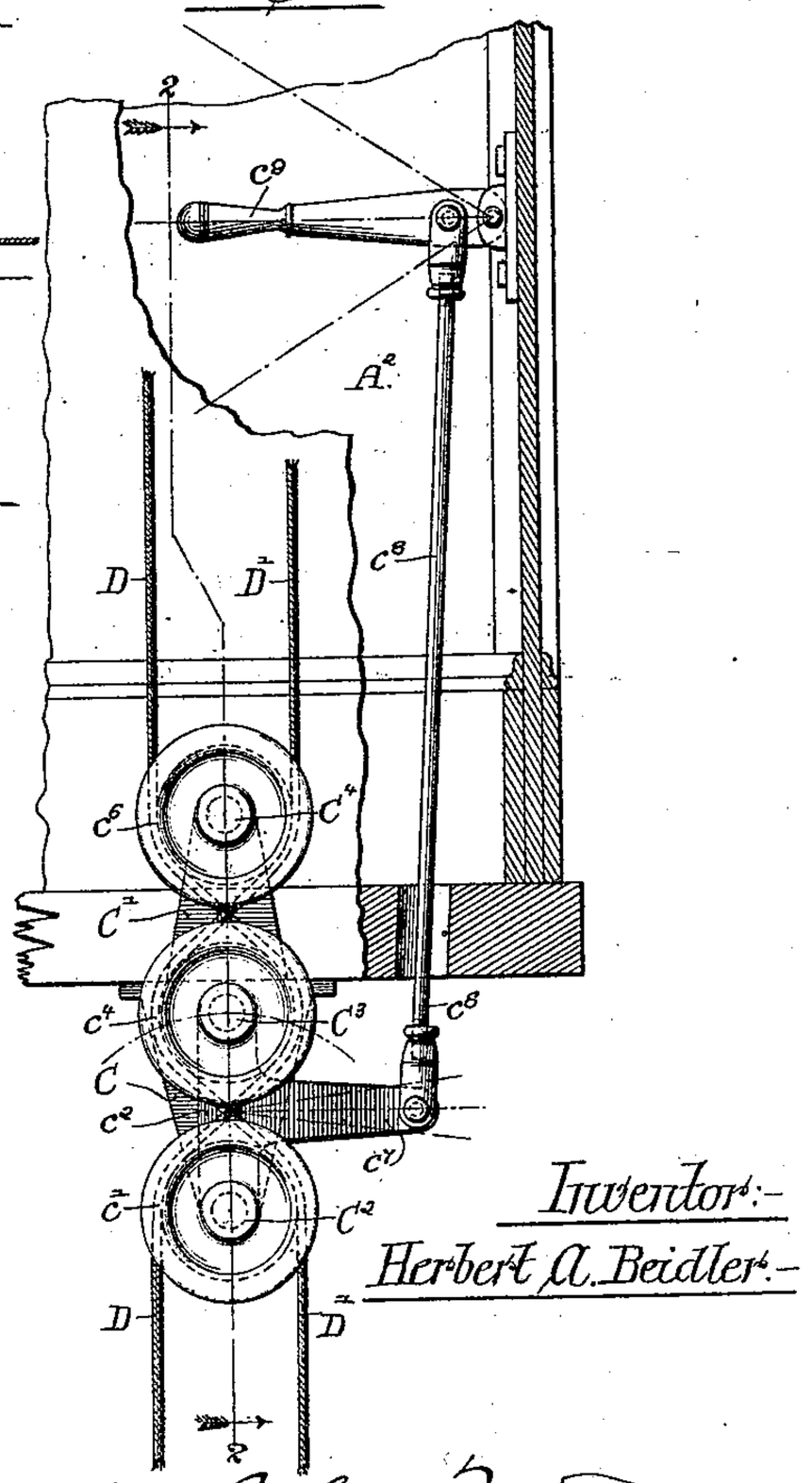
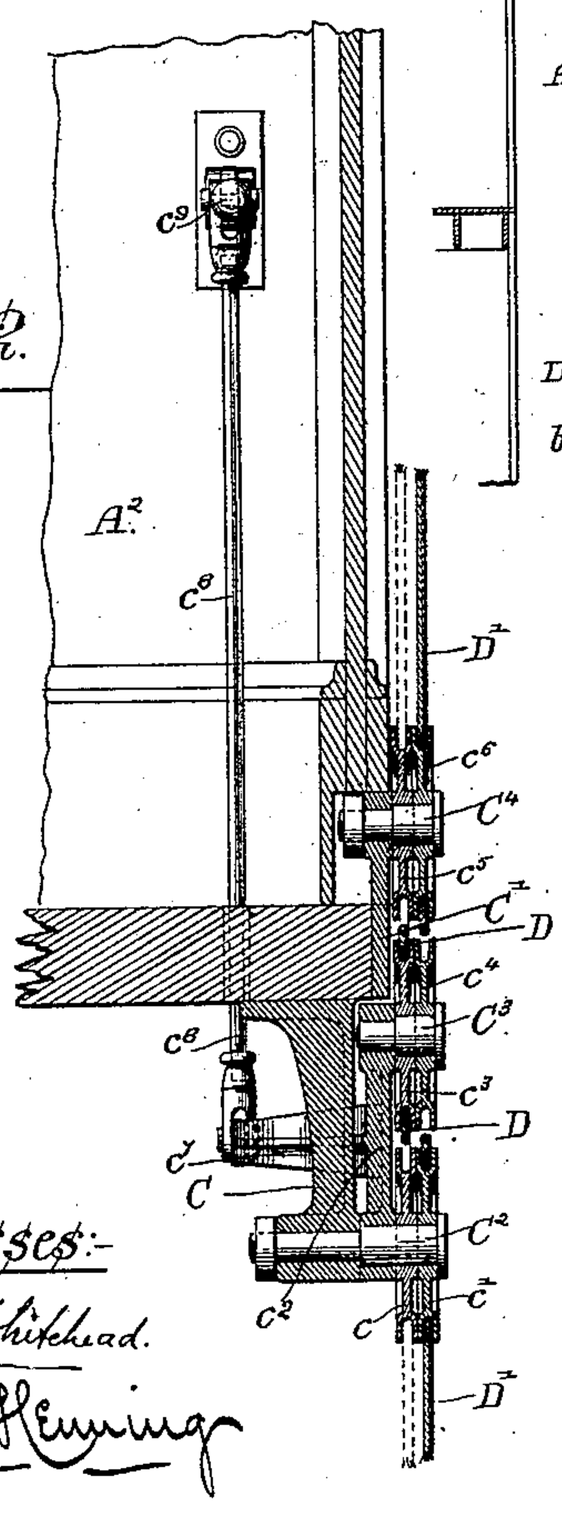


Fig. 2.



Witnesses:-

Louis W. Y. Whitehead.

Wm. F. Fleming

Inventor:-

Herbert A. Beidler.-

by: Dayton, Bolen & Brown

Attorneys.-

UNITED STATES PATENT OFFICE.

HERBERT A. BEIDLER, OF CHICAGO, ILLINOIS.

DEVICE FOR CONTROLLING ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 420,760, dated February 4, 1890.

Application filed June 17, 1889. Serial No. 314,573. (No model.)

To all whom it may concern:

Be it known that I, HERBERT A. BEIDLER, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Devices for Controlling Elevator-Valves; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in devices which govern the movement of the valve employed in connection with hydraulic elevators, wherein said valve controls the admission and discharge of a fluid to and from the cylinder to actuate a piston, whereby a car supported from a suitable cable and connected to said piston may be operated.

The invention consists in the features of construction herein shown, described, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a view in central vertical section of an elevator-shaft and a car which is provided with devices constructed in accordance with my invention. Fig. 2 is a detail view of the portion of the elevator-car with my improved devices applied thereto, the same being shown in vertical transverse section on the line 2 2 of Fig. 3. Fig. 3 is a detail view of the portion of the elevator-car showing the said device in front elevation. Fig. 4 is a vertical transverse sectional view of a modified form of construction embodying my invention. Figs. 5 and 6 illustrate different forms of arrangement of the sheaves and the controlling-cables trained over the same, embodying my invention.

In said drawings, A indicates the elevator-shaft provided near the top with a cross-piece A′, upon which is mounted a pulley *a*, and over which the supporting-cable *a′* of the car A^2 is adapted to run.

B indicates a lever located, preferably, near the bottom of the elevator-shaft and fulcrumed midway the ends thereof to the end *b* of the valve-stem of the engine, whereby, by the oscillation of said lever B, the engine is operated.

C indicates a depending arm secured to the under side of the floor of the car, near one side thereof.

C′ is a plate which is secured to the side of the floor of the car adjacent to the depending arm C, and which, if preferred, can be formed integrally therewith, although in the construction shown said plate C′ is made of a separate piece located as described.

C^2 is a shaft supported in the bearings formed near the lower end of the depending arm C. The said shaft C^2 extends outwardly to a point beyond the sides of the car, and is provided with a pair of sheaves *c c′*, arranged side by side and adapted to freely revolve on the shaft C^2. Upon the shaft C^2, at a point between the sheaves *c* and the arm C, I arrange an oscillatory lever c^2, loosely mounted at its lower end upon said shaft. Said lever c^2 extends upwardly to a point near the floor of the elevator-car, and is provided with an outwardly-projecting stud C^3, upon which are loosely mounted a pair of sheaves c^3 and c^4.

C^4 indicates a stud or trunnion located upon the plate C′ and at a point immediately over the shaft C^2 of the depending arm C. Said trunnion C^4 is also provided with a pair of sheaves c^5 and c^6. The pairs of sheaves *c c′*, c^3 c^4, and c^5 c^6 are arranged in a vertical plane, and are shown as arranged immediately above each other, so that a vertical line drawn through one sheave would pass through one of each of said pairs. The lever c^2 is provided with a laterally-projecting arm c^7, which is connected by means of a rod c^8 with an operating-handle c^9, pivoted within the car and in reach of the attendant.

D D′ indicate valve-controlling cables arranged side by side within the shaft A and attached at their upper ends to the cross-bar A′ at the top of the elevator-shaft. The cable D′ is secured at its lower end to one arm *b′* of the valve-controlling lever B, and the cable D is secured to the other arm b^4 of said lever. The cable D in the construction shown is passed near its lower end around pulleys b^2 and b^3 and secured to the said arm b^4 of the lever B. I have shown the valve-controlling lever B as located so that the end of its arm

b' is directly under the cable D'; but said lever being longer than the distance between the cables, it is necessary to train the cable D around the pulleys b^2 and b^3, so that it will exert a vertical strain upon the arm b^4 of said lever. It will be understood that this arrangement of the lever B and the manner in which the cables D D' are connected therewith is not of the essence of my invention, as various other methods could be employed, it being necessary only to connect the cables with the opposite arms of the lever, as first described. The said cables are arranged upon the sheaves on the car in the following manner, which will be readily understood by reference to Fig. 3: The cable D is trained over the inner sheave of each pair and the cable D' over the outer sheaves. The said cable D is first passed to one side of the sheave c^5, then under the same and half-way around the sheave c^3, whereupon it is passed to the opposite side of the sheave c, from whence it is led downwardly in a vertical direction. The cable D' is trained over the outer sheaves in a reverse manner from which the cable D is trained over the inner sheaves, said cable D' being first passed over the sheave c^6 on the opposite side to that of the companion sheave c^5, over which the cable D passes, and so on over all of said sheaves, as will be readily understood.

It is obvious from the foregoing that when the sheaves c^3 c^4 on the lever C are swung to either side they will have the effect of drawing in one cable and at the same time paying out the other, which movement will be communicated to the valve-controlling lever to operate the same and thus start the elevator. As the elevator moves up or down the said cables will readily travel over the said revoluble sheaves.

The parts of my invention being constructed and arranged as described, the operation is as follows: Upon reference to the drawings, it will be noted that when the handle c^9 is swung in either direction—for instance, upwardly—it will have the effect, by means of the connecting-rod c^8, of elevating the arm c^7 of the lever c^2, and thereby throwing the sheaves c^3 c^4 thereon to the left. This movement of the sheaves will tighten the cable D', and at the same time loosen the cable D. The tightening of the cable D' will elevate the arm b' of the lever B, to which it is attached, and the loosening of the cable D will permit the opposite end of said lever B to descend. The oscillation of said lever B operates the valve of the elevator and permits the elevator to rise, and the cables will travel around the sheaves upon the elevator-car, as will be readily perceived. When the handle c^9 is returned to a horizontal position, the operation of the lever c^2 and sheaves thereon is just the reverse from that formerly described, and said lever is brought to a vertical position, which obviously brings the valve-controlling lever B to a horizontal position, and thus stops the elevator-car. It will be manifest that when the handle c^9 is thrown downwardly the cable D will be drawn inwardly and the cable D' paid out, which movement will cause the valve-controlling lever B to move in an opposite direction from that first described, and allow the elevator to descend.

An obvious advantage gained by the construction herein described is that, owing to the arrangement of the gearing, the ends of the arms of the lever B move twice the distance that the oscillating sheaves move during the same period of time, so that it does not require such a movement of the operating-handle within the car as is usual.

In Fig. 4 I have illustrated a modified form of construction embodying my invention, in which the operating-handle within the car is connected directly with the lever c^2 or is a continuation thereof. In said Fig. 4 the depending arm C is provided with an upwardly-extending portion C^5, which is shown as projecting through the floor of the car, although the said portion C^5 may be a separate piece from the said arm C, and screwed or otherwise secured to the car-floor. The depending arm C is offset or bent outwardly and provided with the shaft C^2, upon which only the pair of stationary sheaves c c' is arranged. The upwardly-projecting arm C^5 is provided with an outwardly-extending shaft C^6. The said shaft C^6 is provided on its outer end with the pair of revoluble sheaves c^5 c^6.

E indicates an actuating-lever extending upwardly within the car within reach of the attendant and fulcrumed upon the shaft C^6, between the sheaves c^5 c^6 and the arm C^5. The said actuating-lever is provided with a downwardly-extending portion or arm E', which is provided with a stud e, upon which the oscillatory sheaves c^3 c^4 are mounted. The cables D and D' are trained over the said pairs of sheaves, as before described. The operation of oscillating the sheaves c^3 c^4 to tighten and loosen the cables by means of the handle E is entirely obvious.

In Figs. 5 and 6 I have shown different forms of arranging the sheaves. In Fig. 5 the pairs of sheaves c c' and c^5 c^6 are not arranged side by side to revolve upon the same shaft, as shown in the preceding figures, but are separated and located upon either side of the oscillating sheaves c^3 c^4, which are arranged as usual. In Fig. 6 the preceding arrangement of the stationary sheaves is observed, while at the same time the oscillating sheaves c^3 c^4 are placed upon separate studs or shafts after the manner of the said stationary sheaves. The cables are trained over the pairs of sheaves after the same manner in which they are trained as first described.

It will be understood that I do not intend to restrict myself to the precise details of construction herein shown and described, but re-

serve the right to make all changes and to employ all mechanical expedients that come within the scope of the appended claims.

I claim as my invention—

1. The combination, with an elevator-car, of valve-controlling cables attached at their upper ends near the top of the elevator-shaft and at their lower ends to a valve-controlling lever, two sets of stationary sheaves arranged upon said elevator-car, over which said controlling-cables are trained, an oscillating sheave or sheaves located between said stationary sheaves and in contact with both of the controlling-cables, and means located within the car adapted to operate said oscillating sheave or sheaves to tighten one of said controlling-cables and to loosen the other, substantially as described.

2. The combination, with an elevator-car and its controlling-valve, of valve-controlling cables attached at their upper ends near the top of the elevator-shaft and at their lower ends to a valve-controlling lever, two pairs of stationary revoluble sheaves arranged upon said car, and a pair of oscillating sheaves located between said stationary sheaves and adapted to oscillate by a lever mounted upon the car, each of said controlling-cables being passed around one of said stationary sheaves, around the other side of the oscillating sheave that registers therewith, and then around the remaining stationary sheave, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

HERBERT A. BEIDLER.

Witnesses:

TAYLOR E. BROWN,

HARRY COBB KENNEDY.