

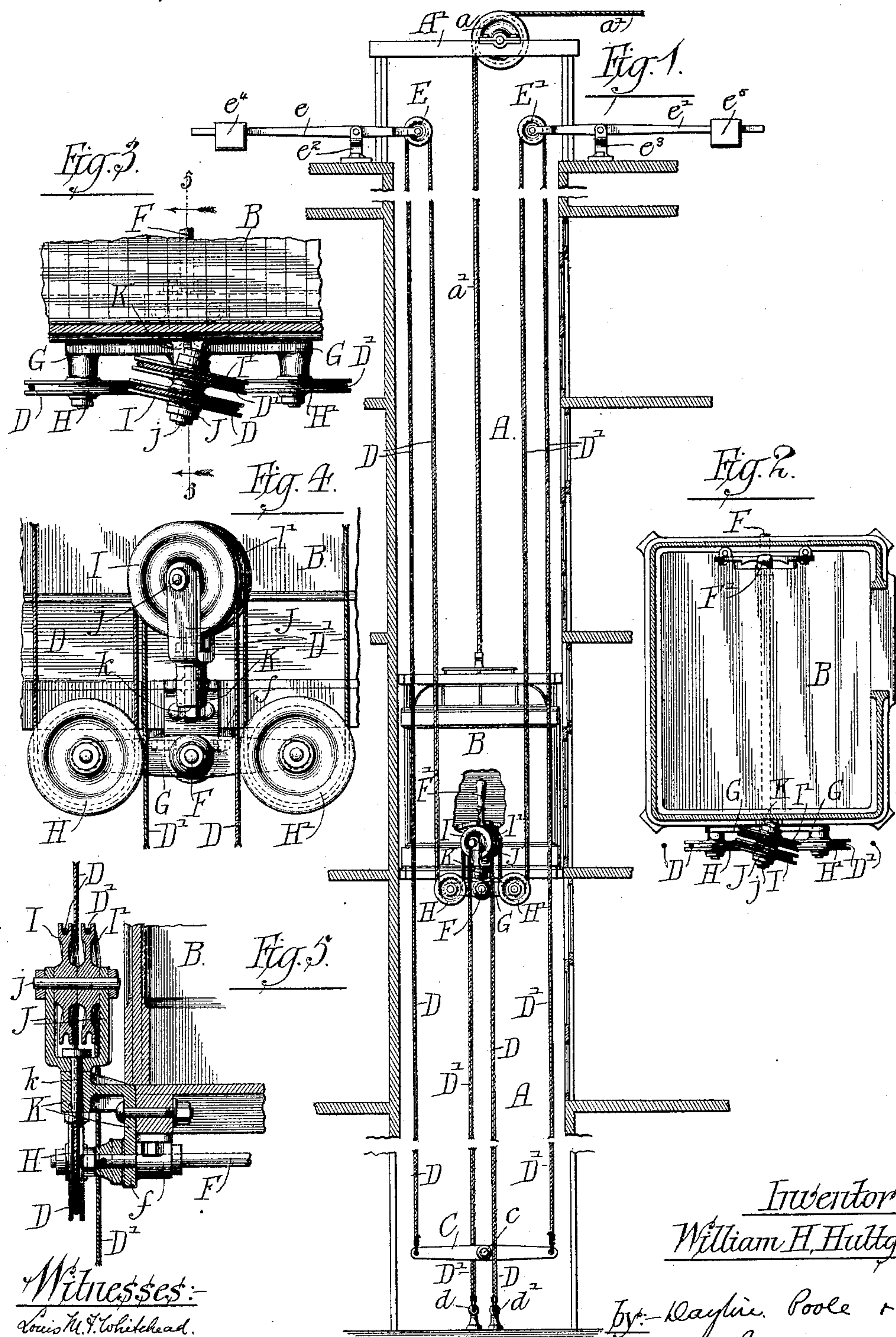
(No Model.)

W. H. HULTGREN.

VALVE OPERATING DEVICE FOR ELEVATORS.

No. 468,044.

Patented Feb. 2, 1892.



Witnesses:-

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UNITED STATES PATENT OFFICE.

WILLIAM H. HULTGREN, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO
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VALVE-OPERATING DEVICE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 468,044, dated February 2, 1892.

Application filed March 31, 1891. Serial No. 387,136. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. HULTGREN, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Valve-Actuating Devices for Elevators; 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 employed in connection with hydraulic or steam elevators to govern the movements of the valve which controls the admission and discharge of a fluid to and from the hydraulic or steam cylinder which contains the movable piston, through the medium of which power is applied to the car for moving the same.

The invention consists in the matters hereinafter described, and pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a view in central vertical section of an elevator-shaft and a car therein, illustrating valve-actuating devices constructed in accordance with my invention. Fig. 2 is a plan section of the car with my improved valve-actuating devices attached thereto. Fig. 3 is an enlarged plan view of the rope sheaves or pulleys shown in Fig. 2. Fig. 4 is an enlarged detail side elevation of the said sheaves or pulleys. Fig. 5 is a detail section taken upon line 5 5 of Fig. 3.

As illustrated in said drawings, A indicates the elevator-shaft, and A' a cross-piece at the top of the same, upon which cross-piece is mounted a pulley *a*, over which passes the supporting-cable *a'* of the elevator car or cab B.

C indicates a lever located, preferably, near the bottom of the elevator-shaft and mounted midway of its ends upon a rock-shaft *c*, through the medium of which the controlling-valve of the engine or hydraulic cylinder is actuated.

D D' indicate valve-controlling cables located within the shaft A. Said cables D D' are each attached at one end to the valve-operating lever C at the bottom of the shaft, ex-

tend upward through the shaft, and pass over pulleys E E' at the top of the same, and from said pulleys pass downwardly over or around sheaves upon the car B, which will hereinafter be described, and are immovably secured or anchored at their opposite ends to the bottom of the shaft.

d d' indicate stationary eyes or rings, to which the lower ends of the ropes D D' are secured.

The pulleys E E' at the top of the shaft are made vertically movable to take up slack in the valve-controlling cables, and are preferably provided with means acting constantly thereon to maintain the cables taut. Such means may consist of springs, weights, or other equivalent devices tending to move the pulleys in a direction to keep taut the said operating-ropes, and the pulleys may be mounted in any suitable way to secure freedom of vertical movement therein. As a simple and convenient construction for the purposes last referred to, said pulleys are mounted on horizontally-arranged levers *e e'*, which levers are fulcrumed between the ends upon stationary supports *e² e³* and are provided with counterbalance-weights *e⁴ e⁵*, acting to lift the ends of the levers in which the pulleys are mounted.

F indicates a rock-shaft mounted horizontally upon the cap B and preferably arranged beneath the bottom or floor of the cab. Attached to one end of said rock-shaft is a hand-lever F', which extends upwardly into the interior of the cab in position convenient for the hand of the operator. Rigidly secured to said shaft, at one side of the cab, is a horizontally-arranged lever G, which is secured at its center to the shaft and carries at its opposite ends two grooved pulleys or rope-sheaves H H'.

I I' are two grooved pulleys or rope-sheaves mounted on the car adjacent to the pulleys H H' and at one side of a straight line passing through the pivotal axes of said pulleys. Said pulleys I I' are mounted to rotate freely and independently of each other upon a suitable shaft or bearing, and are so located with relation to said pulleys H H' that the valve-operating ropes D D' may each pass around one of the pulleys H H' and then around one

of the pulleys I I' and thence downwardly or upwardly in the shaft. The general result obtained by this construction is that when one of the movable pulleys H or H' is raised or lowered the rope passing around said pulley is either taken up or paid out, and inasmuch as both pulleys H H' are moved equally and in opposite directions one rope will be taken up and the other paid out by the shifting of the hand-lever F' and the valve-controlling lever C thereby moved as desired.

I have hereinbefore described the rope-pulleys I I' as being mounted at one side of a line passing through the axes of rotation of the movable sheaves H H', it being obvious that the same result will be obtained by placing the said sheaves I I' either above or below the said pulleys. As herein illustrated, the said sheaves I I' are mounted on the frame of the car above the pulleys H H', and devices are provided for supporting said pulleys as follows: J is a yoke or frame, in the upper part of which is rigidly secured a short shaft or pivot-pin j, on which the pulleys I I' are mounted and freely turn.

K is a rigid arm or bracket secured to the frame of the car and extending outwardly therefrom and which affords pivotal support for the frame or yoke J, which is pivoted thereto in such manner that it may swing freely on a vertical axis. In the particular construction illustrated a pivot-pin k is inserted through the lower part of the frame or yoke J and through the bracket K to afford such pivotal connection; but any other construction adapted to form such pivotal connection may be used when desired.

The purpose of the pivotal connection described between the frame J and the bracket K is to enable the sheaves or pulleys I I' to adjust themselves at a proper angle or position relatively to the sheaves H H', so that the ropes D D' will run freely over the said sheaves. In the particular construction shown said sheaves H H' are arranged in the same plane with each other, so that the sheaves I I' necessarily assume an inclined or oblique position to enable the ropes to pass in a straight line from and to said sheaves, as clearly seen in Fig. 3. This construction is not essential, however, inasmuch as the sheaves H H' may be arranged in different planes, in which case

the sheaves I I' might be less inclined or located in planes parallel with the sheaves H H'. In any case, however, I prefer to pivotally support the sheaves I I', in order that they may accurately adjust themselves to the position of the valve-actuating ropes. As a convenient and desirable construction in the parts the bracket K is herein shown as cast integral with the bearing f, in which the adjacent end of the shaft F is supported.

While I have shown the valve-actuating ropes D' as extending from the valve-actuating lever C to the top of the shaft and then back again to the bottom of the same, yet this particular arrangement of the ropes is not essential, and said ropes may be otherwise arranged without departing from the spirit of my invention.

I claim as my invention—

1. The combination, with an elevator-car, of valve-controlling cables located within the shaft and attached at their ends to a valve-controlling lever of a suitable motor, a horizontally-arranged oscillating lever mounted on the car, a sheave mounted upon each end of said lever, two sheaves pivotally located upon the car and constructed to freely rotate independently of each other, said sheaves being positioned at one side of a line passing through the sheaves on the oscillating lever, and means connected with the said oscillating lever for actuating said movable sheaves to take up one of said controlling-cables and to pay out the other, substantially as described.

2. The combination, with the valve-controlling cables of an elevator-car, of a horizontally-arranged oscillatory lever mounted upon the car and having a sheave at each end, two independently-rotatable sheaves located above said lever, and a pivoted or swiveled yoke or frame upon which said independently-rotatable sheaves are mounted, substantially as described.

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

WILLIAM H. HULTGREN.

Witnesses:

C. CLARENCE POOLE,
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