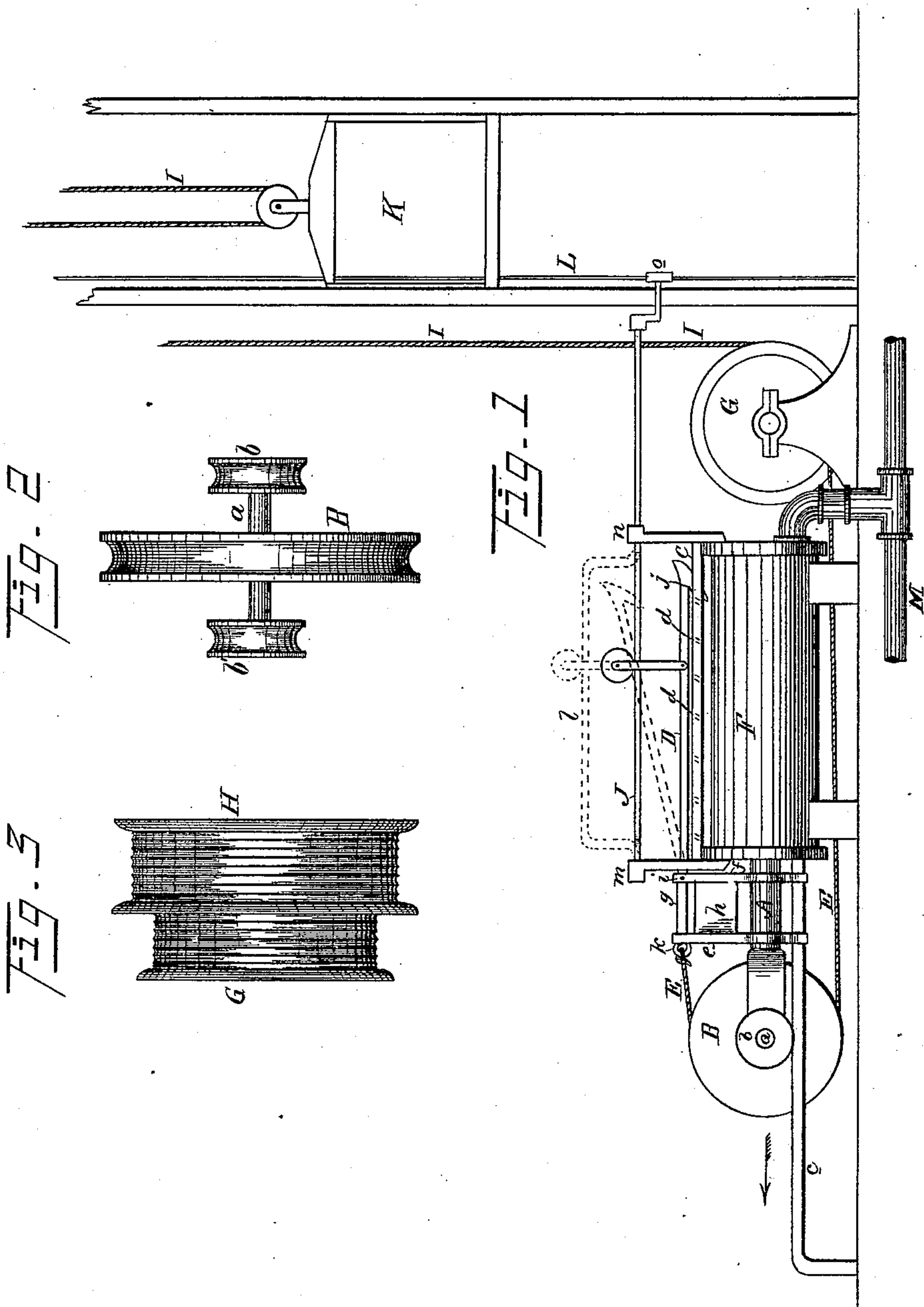


(No Model.)

G. W. JONES.  
HYDRAULIC ELEVATOR.

No. 470,936.

Patented Mar. 15, 1892.



Witnesses  
O. A. Biddle  
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# UNITED STATES PATENT OFFICE.

GEORGE W. JONES, OF CLEVELAND, OHIO.

## HYDRAULIC ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 470,936, dated March 15, 1892.

Application filed July 12, 1890. Serial No. 358,587. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE W. JONES, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new Improvements in Hydraulic Elevators; and I do hereby declare the following to be a full, clear, and complete description thereof.

My invention relates to a hydraulic elevator so arranged that a less amount of water is necessary to carry a light load or the empty car the same distance than is necessary to carry a heavy load. Said elevator is so constructed that with a light load the piston only travels a portion of the length of the cylinder, while with a heavy load it travels the whole distance, necessitating more water to force it the extra distance.

That the invention may be seen and fully understood, reference may be had to the following specification and accompanying drawings, in which—

Figure 1 is a side elevation of the said elevator. Figs. 2 and 3 are detached sections hereinafter fully explained.

The outer end of the piston-rod A, Fig. 1, is bifurcated. A shaft *a*, passing through the terminals of the bifurcated portion, has the wheels *b b'*, Figs. 1 and 2, on the ends thereof, and the sheave B on the same shaft between the two arms formed by the bifurcation of the piston-rod A. The wheels *b b'* are mounted on the track *c* and travel thereon, operating conjointly with the piston-rod A. Rigidly attached to the top of the cylinder and extending longitudinally thereon is a rack C, having a series of cross-pieces *d* arranged thereon corresponding with the number of floors in the building in which the elevator is used. A movable frame is arranged at the rear end of the cylinder, consisting of the uprights *e* and *f*, Fig. 1, connected at the top by the rod *g* and the plate *h*, said uprights having holes therein through which the piston A passes, and having arms extending out on each side over the track *c* for the purpose of keeping said frame in an upright position. Attached to said frame by a pivotal joint *i* is an arm D, which extends along the top of the cylinder and has an acute-angled hook *j* at the terminal thereof for engagement and disengagement with the cross-pieces *d* in the manner hereinafter de-

scribed. At the opposite side of the frame, at a point *k*, is attached a cable E, which passes around the sheave B and under the cylinder F to a drum arranged at the front end of the cylinder. Said drum may be a duplex drum, substantially of the form shown in Fig. 3, the part G, on which the cable E winds, being of less diameter than the part H, on which the hoisting-cable winds, or it may be a common drum. The arm D is supported on a pivotal frame J, substantially of the shape shown by dotted lines *l*, Fig. 1, pivoted in the uprights *m* and *n*, which are attached to the cylinder F. Said frame J can be raised or lowered at the will of the operator on the car K by means of a rod L, running from the cellar to the top floor through the shaft, said rod being connected with the pivotal frame J by a swivel-joint *o*.

Having described the arrangement of the parts of my invention, I will now explain the operation thereof.

Suppose that the car K is in the basement loaded for the top floor and the hook *j* is disengaged from the rack C. Water is turned on through the pipe M, forcing the piston in the direction of the arrow. The hook *j* being disengaged permits the frame to which the cable E is attached to travel with the piston, necessitating the forcing of the piston the entire length of the cylinder to cause the drum G to revolve, by means of the cable E, a sufficient number of times to raise the car K to the top floor by means of the winding up of the cable E. Now, suppose that the car K is in the basement and it is desired to ascend to the top floor light. In this case the hook *j* is dropped over one of the cross-pieces *d* in the rack C, thereby locking the frame and securing the end of the cable E, resultant from its attachment to said frame at *k*. The water is then turned on through the pipe M and the piston forced in the direction of arrow; but owing to the end of the cable E being secured at the point *k* the sheave B will revolve, thereby causing the drum G to revolve a greater number of times in the same distance traveled by the piston-rod than it would if the hook *j* were disengaged and the frame, with the cable E attached thereto, were allowed to travel with the sheave B.

If it is desired to carry a load to an inter-



mediate floor between the basement and top floor, leaving the load at said intermediate floor and proceeding to the top floor light, the hook *j* is disengaged until said floor is reached.

5 Then, by means of the rod *L*, the hook *j* is caused to drop into the rack *C*, engaging with the cross-piece *d*, corresponding to the intermediate floor. The elevator-car will then proceed the remainder of the distance with a less  
10 amount of water for the reason hereinbefore stated. The hook *j* being an acute-angled hook makes it impossible to get out of the rack while the elevator is moving upward.

What I claim as of my invention, and desire  
15 to secure by Letters Patent, is—

1. In a hydraulic elevator, a frame of the form described, arranged at the rear end of the cylinder in movable connection with the piston-rod, the cable *E*, attached to said frame,  
20 operating conjointly with the traveling catch on top of cylinder, sheave *B*, piston *A*, and drum or sheave *G*, arranged substantially as and for the purpose set forth.

2. In a hydraulic elevator, a rack *C*, arranged longitudinally on the cylinder and having cross-pieces *d* arranged therein, in combination with the arm *D*, having a hook  
25 *j* at the end thereof, the opposite end attached to a frame arranged at the rear of the cylinder and movable on the piston-rod operating conjointly with said frame, sheave *B*, piston-rod *A*, and a pivotal frame *J* for engagement and disengagement of the hook *j* with the  
30 cross-piece *d*, whereby the piston-rod *A* is

caused to raise the car *K* a certain distance 35 by traveling the full length of the cylinder or a portion thereof, substantially as and for the purpose set forth.

3. In a hydraulic elevator, a frame arranged at the rear of the cylinder, in combination 40 with the cable attached to said frame and passing over a sheave *B*, arranged on the end of the piston-rod, an adjustable arm attached to said frame and having an angular hook at the end thereof for engagement and dis- 45 engagement with a longitudinal rack having cross-pieces therein, arranged substantially as and for the purpose specified.

4. In a hydraulic elevator, a pivotal frame arranged over the cylinder, connected with 50 and operated by a rod extending through the elevator-shaft, in combination with an arm attached to the movable frame, said arm having an angular hook at the end thereof for engagement and disengagement with a longi- 55 tudinal rack arranged on top of cylinder in conjoint operation with the piston and sheaves *B* and *G*, cable *E*, and the cylinder, whereby the load may be carried the entire length of shaft by a full piston-stroke or a partial stroke, 60 substantially in the manner as set forth.

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

GEORGE W. JONES.

Witnesses:

W. H. BURRIDGE,  
L. F. GRISWOLD.