(No Model.)

2 Sheets—Sheet 1.

# E. B. ELLINGTON.

## ELEVATOR.

No. 383,715. Patented May 29, 1888.

FIG. 3.

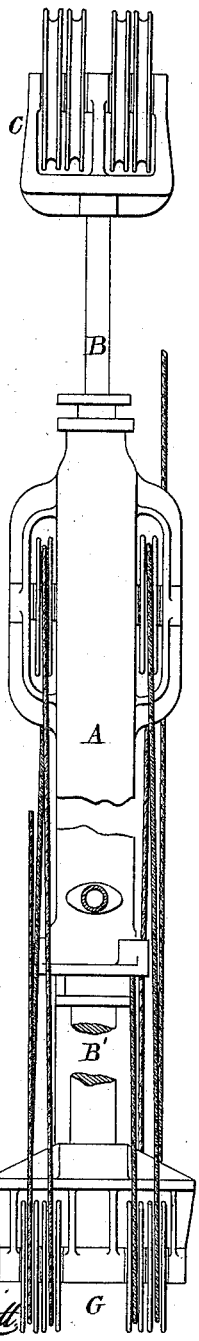



FIG. 2.

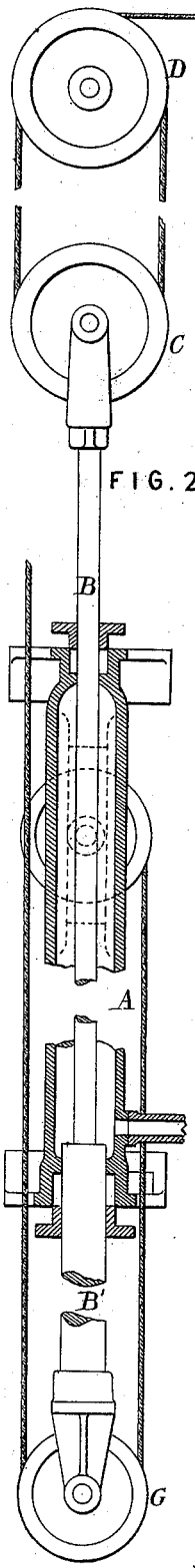
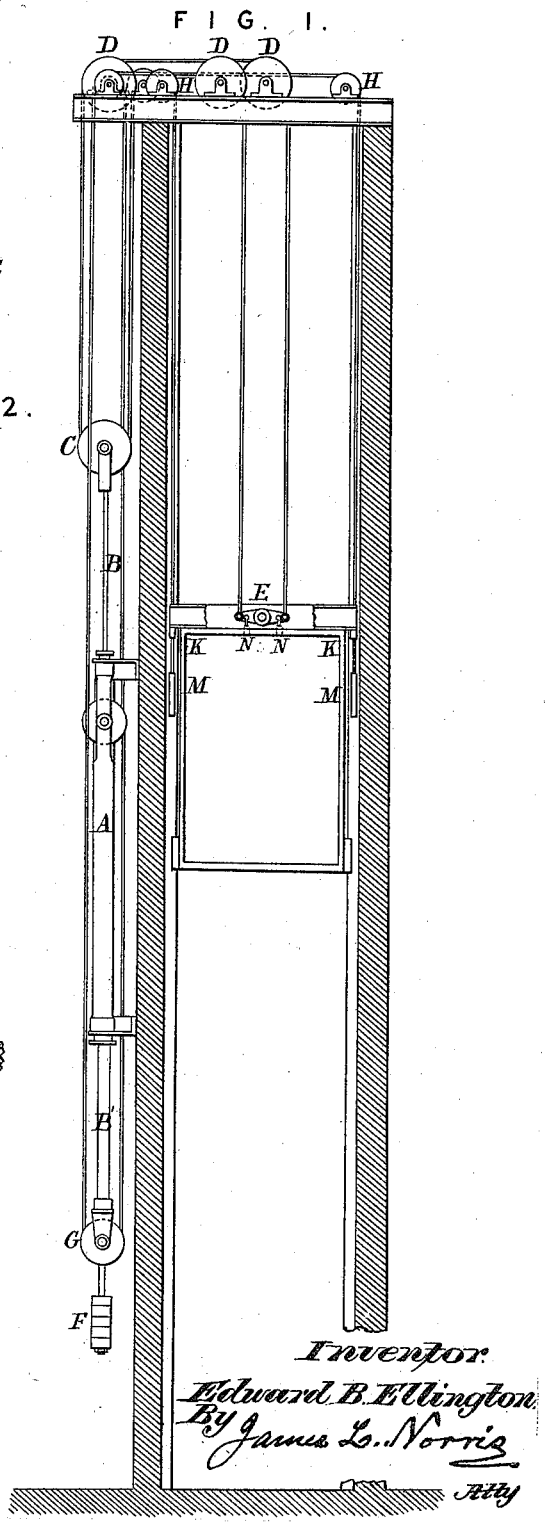



FIG. 1.




Witnesses.
J. A. Rutherford
Robert Everett

Inventor:
Edward B. Ellington
By James L. Norris
Atty

(No Model.)

2 Sheets—Sheet 2.

# E. B. ELLINGTON.

## ELEVATOR.

No. 383,715. Patented May 29, 1888.

FIG. 5.

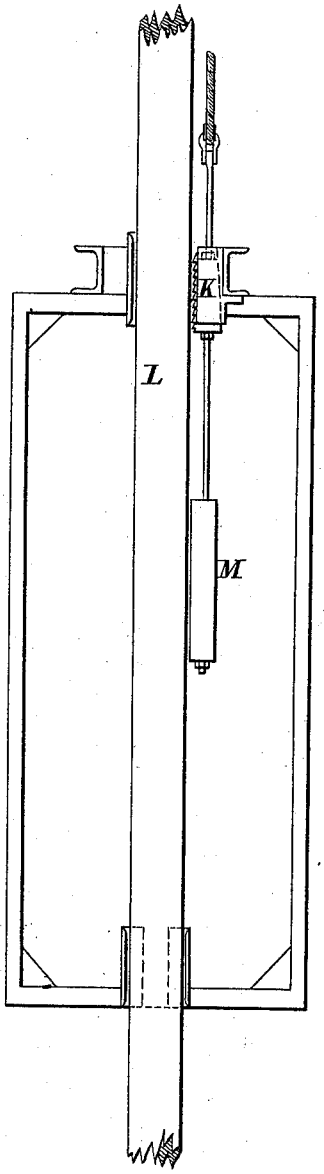



FIG. 4.

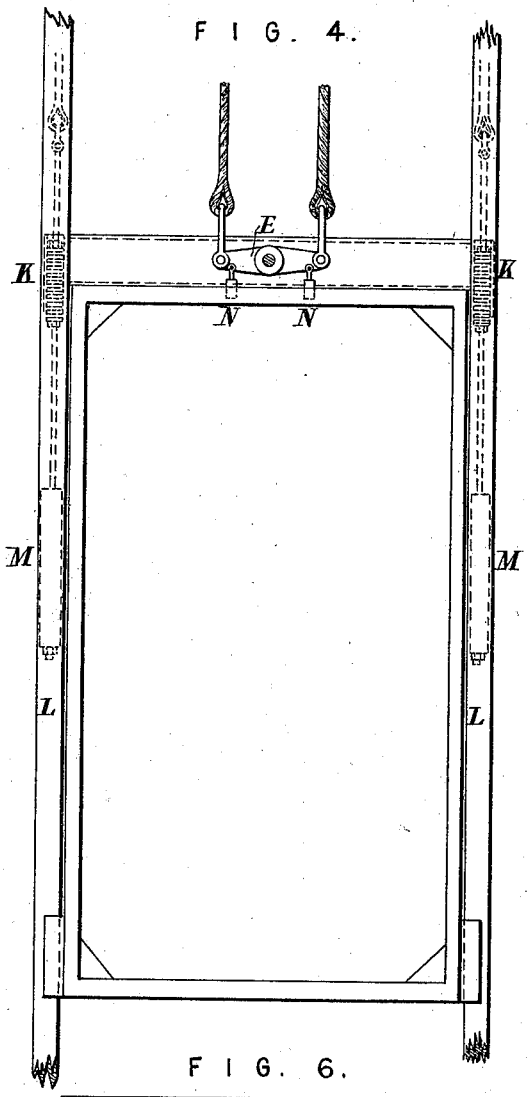
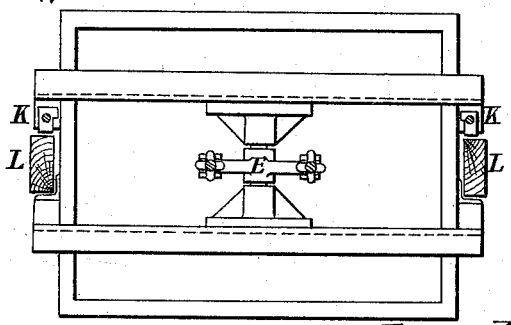



FIG. 6.




Witnesses.

J. A. Rutherford.

Robt. Everett.

Inventor.

Edward B. Ellington.

By James L. Norris

Atty.

# UNITED STATES PATENT OFFICE.

EDWARD B. ELLINGTON, OF WESTMINSTER, ENGLAND.

## ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 383,715, dated May 29, 1888.

Application filed November 2, 1887. Serial No. 254,109. (No model.) Patented in England January 27, 1887, No. 1,190; in France November 2, 1887, No. 186,721; in Belgium November 4, 1887, No. 79,412; in Victoria November 21, 1887, No. 5,455, and in New South Wales November 23, 1887, No. 354.

*To all whom it may concern:*

Be it known that I, EDWARD BAYZAND ELLINGTON, a citizen of England, residing at Palace Chambers, Westminster, in the county of Middlesex, England, have invented a new and useful Improvement in Hydraulic Lifts, (for which I have obtained patents in Great Britain January 27, 1887, No. 1,190; in France November 2, 1887, No. 186,721; in Belgium November 4, 1887, No. 79,412; in Victoria November 21, 1887, No. 5,455, and in New South Wales November 23, 1887, No. 354,) of which the following is a specification.

My invention relates to lifts such as are employed in buildings for communicating from floor to floor, these being worked, in the manner of hydraulic cranes, by ropes or chains passing over pulleys and attached to the piston or plunger of a hydraulic cylinder.

The chief objects of my invention are to arrange in a compact and convenient manner the hydraulic cylinder and its attachments, and to provide for safety in case of any of the connections from the plunger to the cage yielding or breaking, as I will describe, referring to the accompanying drawings.

Figure 1 is a vertical section of the lift-shaft, showing the general arrangement of the cage, the hydraulic cylinder, and their connections. Fig. 2 is a vertical section, and Fig. 3 is an elevation, of the hydraulic cylinder and its pulleys. Fig. 4 is a side view, Fig. 5 an end view, and Fig. 6 a plan, of the cage with means of arresting it in case of accident.

I place vertically in or at the side of the shaft the hydraulic cylinder A, making it as long as possible, so as to avoid as much as possible multiplication of the stroke by pulleys or otherwise, and I fit it with a plunger, B B′, passing through packings accessible externally at both ends of the cylinder A, the upper part, B, of the plunger being smaller than the lower part, B′, which affords an area on which the water-pressure acts to move the plunger down.

On the upper end of the plunger B, I mount, in the usual way, multiplying pulleys or gear C, from which the ropes or chains (of which there are preferably four) pass over guide-pulleys D at the upper part of the lift-shaft, and are attached to opposite ends of rocking cross-heads E, pivoted to the cage. To the lower end of the plunger B′, I attach counterweights F, and I also attach thereto multiplying pulleys or drums G, from which independent ropes pass up over guide-pulleys H at the top of the shaft, and down to sliding wedges K, arranged in the guides of the cage, as shown in Figs. 4, 5, and 6. The wedges K are usually kept down just clear of the guides L by weights M; but should the attachments of the cage to the plunger B give way the cage would begin to descend more rapidly than the wedges K, which are commanded by the independent rope worked from B′, and consequently the wedges would in that case move upward relatively to the cage and act as a brake, retarding or entirely stopping the cage. When the guides are of wood, as indicated in the drawings, the faces of the wedges may be serrated, as shown, so as to take a firm grip of the guides.

Obviously, whether the hydraulic cylinder is arranged vertically, as shown in the drawings, or in any other position, the brake-wedges K may be applied to the cage, as described, the ropes to which they are attached being connected to the working plunger, so as to move uniformly with the suspending ropes or chains.

To the pivoted cross-heads E, to which the main ropes or chains of the cage are attached, I apply indicators N, one or other of which, projecting through a hole in the roof of the cage, may show to the attendant in the cage if either of these cross-heads has rocked out of level, thereby warning him of danger by apprising him that one or other of the ropes or chains has yielded unduly or broken.

Having thus described the nature of my invention and the best means I know for carrying the same into practical effect, I claim—

1. In combination with the guides L L, wedges K K, and the rocking cross-head E, attached to an elevator-cage, an elongated hydraulic cylinder, A, the plunger B B′, carrying the multiplying drums or pulleys C G, and weights F, the guide-pulleys D H, and ropes or pulleys passing in duplicate over said multiplying-drums and guide-pulleys to the wedges and rocking cross-head, substantially as described.

2. The combination, with an elevator-cage having a rocking cross-head, E, for attachment of suspension ropes or chains, of the indicators N N, attached to said cross-head and depending into the cage, substantially as described.

3. In combination with an elevator-cage having a rocking cross-head, E, the long vertical hydraulic cylinder A, the plunger B B′, carrying a multiplying-gear, C, and weights F, the guide-pulleys D D, and ropes or chains passed in duplicate over said guide-pulleys from the multiplying-gear to the rocking cross-head, substantially as described.

4. In combination with an elevator-cage, its suspension ropes or chains, and an elongated vertical hydraulic cylinder having a plunger, B B′, carrying a multiplying-gear for attachment of said suspension ropes or chains, a multiplying-gear, G, carried by said plunger, weighted brake-wedges K K, arranged on the cage, guide-pulleys H H, and an independent set of ropes or chains passed from the gear G over the pulleys H to said brake-wedges and moved uniformly with the suspension ropes or chains, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 21st day of October, A. D. 1887.

E. B. ELLINGTON.

Witnesses:

OLIVER IMRAY,

*Patent Agent, 28 Southampton Buildings, London, W. C.*

WALTER J. SKERTEN,

17 *Gracechurch Street, London, E. C.*