

No. 143,013. Patented September 23, 1873.

FIG. 1. X

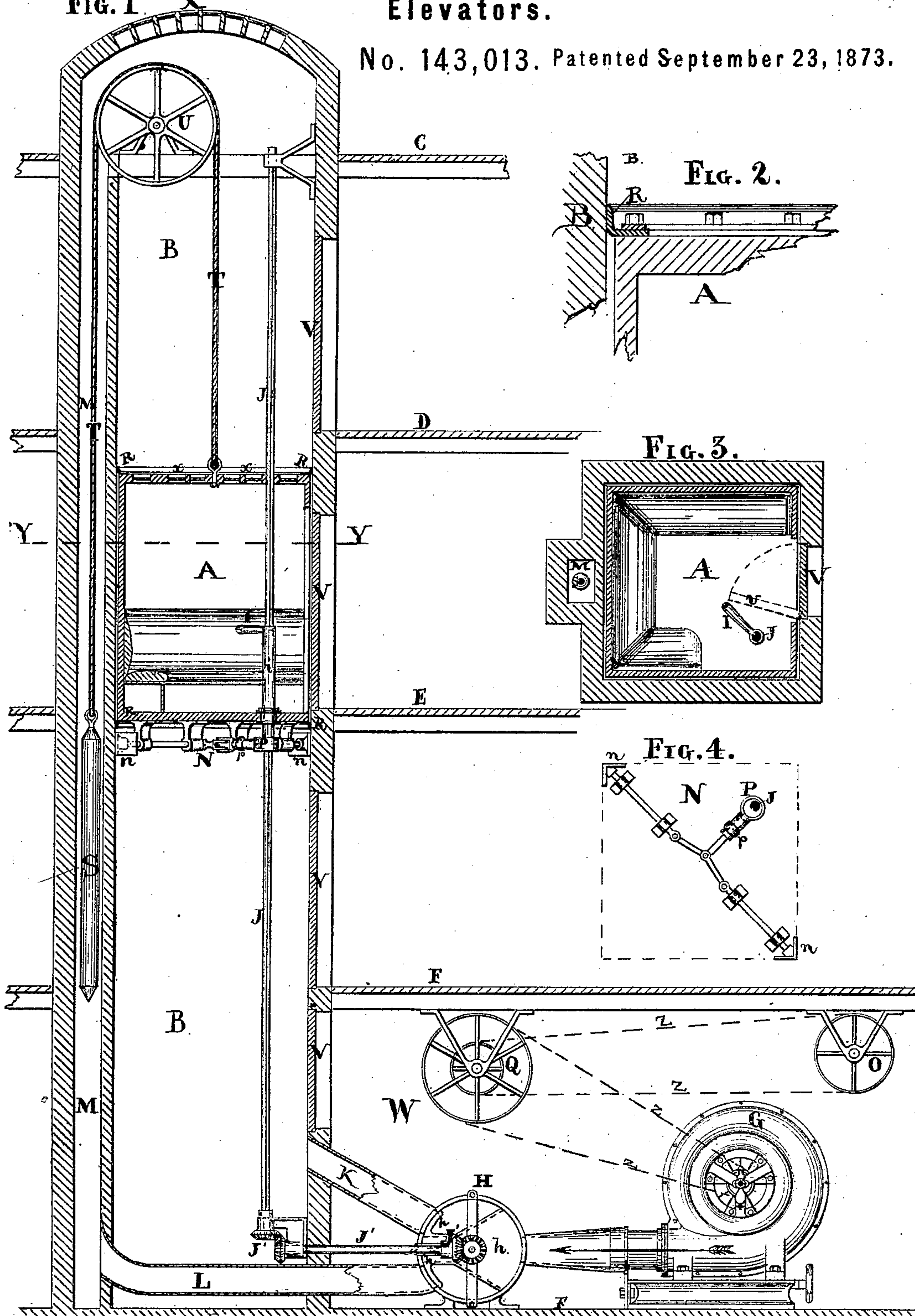


FIG. 2.

FIG. 3.

FIG. 4.

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IMPROVEMENT IN ELEVATORS.

Specification forming part of Letters Patent No. 143,013, dated September 23, 1873; application filed September 30, 1872.

To all whom it may concern:

Be it known that I, GEORGE W. HUBBARD, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain Improvements in Elevators, of which the following is a specification:

My invention relates to that class of elevators in which atmospheric air is used as the moving and retarding medium, the same being under pressure or partial vacuum, as circumstances may require, and as hereinafter described. The object of my invention is to produce an elevator, more particularly for passenger use, which shall combine a very great degree of safety from accident, from breakage of the machinery or other causes, with cheapness and simplicity of construction and use.

Figure 1 is a vertical section through the well and its car, showing also the brake and air-forcing machinery and their attachments in elevation. Fig. 2 is an enlarged section, showing packing of car. Fig. 3 is a horizontal section through Y Y. Fig. 4 is a view, looking upward toward bottom of car, showing arrangement of brake.

Like letters indicate corresponding parts in the several figures.

B B represent an air-tight well or hoist-way as constructed in a building, of which C D E F are the several floors. V V V V represent doors, at various heights in the walls of the well B B, for ingress or egress of passengers or load, the said doors shutting air-tight and flush with the interior of the well B B. A represents the car, which moves freely up and down in the well B B. R R R R represent leather or other suitable flexible packing, attached to the car A and held pressed in contact with the walls of the well B, thereby preventing the escape of air past the car A, and at the same time adapting itself to any irregularities in the walls or lining of the well B. S represents a counterbalance weight attached to the car A by the cord T passing over the wheel U, and exceeding the weight of the car by about one-half of its probable load. The weight S moves in the air-flue M, which is made sufficiently large for this and other purposes hereinafter described. G represents a fan-blower or other suitable machinery for

producing a blast of air under the necessary pressure in the direction indicated by the arrow on G. H represents a valve, which, at the option of the attendant in the car A, through the medium of the handle I, slotted shaft J, and shaft and gearing J' J' J', and rotating, hollow, funnel-shaped piece *h* of the valve H, shuts off or changes the directions of the air-currents, as hereinafter described.

Supposing the handle I moved into a position which, through the shafts and gearing J J' J' J' and rotating piece *h*, directs the air-blast through the tube K into that portion of the well B beneath the car A—thus forcing the car upward—it is evident from the drawing of valve H that, simultaneously, communication is opened through the valve H, tube L, and flue M, between the upper portion of the well B and the room W containing the blowing machinery, thus allowing the air to escape from that portion of the well B above the car A, and allowing the ascent of the car in the well, at the same time supplying from the upper portion of the well B the air required through the blower G and beneath the car A in the process of forcing the car upward. It is evident that a proper movement of the handle I will reverse the action above described, directing the air-blast through the tube L and flue M to that portion of the well B above the car A, thus forcing it downward, while simultaneously the lower portion of the well is opened to communication with the room W, allowing the car to descend in the well, and at the same time supplying from the lower portion of the well B the air required in the upper portion and through the blower G in the process of forcing the car downward. The room W, containing the blower G, being constructed air-tight or nearly so, a partial vacuum is produced in it by suction of the blower G, and this vacuum produces a similar one in that portion of the well B open at the time to the room W, thereby assisting in the movement of the car A.

As represented in the drawing, the handle I, and the rotating piece *h* which it controls, are in such positions as close all communications of both the upper and lower portions of the well B with either the blast from the blower or the air of the room W, thereby hold-

ing the car A in a stationary position, both by compression of the air in one and partial vacuum in the other portion of the well B. The brake N (Figs. 1 and 4) is so constructed and connected that the movement of the handle I into the position last described, through the connecting-sleeve *i* and attached eccentric P and arrangement of rods and joints as shown, simultaneously thrusts the shoes *n n* forcibly against the walls of the well B, thus assisting to maintain the car A in a stationary position. *p* represents a spring or elastic washer, which holds the shoes *n n* pressed against the sides of the well B during a slight opening of the valve H, admitting air-pressure into one part of the well B.

The doors V V V V when open, and at the same time properly opposite the car A, are swung into the interior of the car, as shown in dotted lines at *v*, Fig. 3, and thereby obstruct and prevent any movement of the car in either direction until the door is completely closed.

The construction of the car A and its packing are such that when opposite the doors of well, as above described, it shuts off air-pressure or vacuum from that particular portion of

the well, thus allowing the door of well to be freely opened and closed.

O represents a shaft, from which the counter-shaft Q and blower G are driven. X and *x* show the manner of admitting light to the interior of the well B and car A through airtight and sufficiently-strong "sky-lights."

I make no claim to the use of atmospheric air for elevators, for I am aware that it is not new; but

I claim as my invention—

1. The flues or tubes L, M, and K, communicating from the common chamber W to the two extremities of the well B B.

2. The valve H, constructed and operating substantially in the manner and for the purpose described.

3. The devices, substantially as described, by which the brake N and valve H are simultaneously operated in the manner and for the purpose described.

4. The doors V, swinging inwardly, in combination with the vertically-moving car A, as and for the purpose described.

Witnesses: GEO. W. HUBBARD.

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