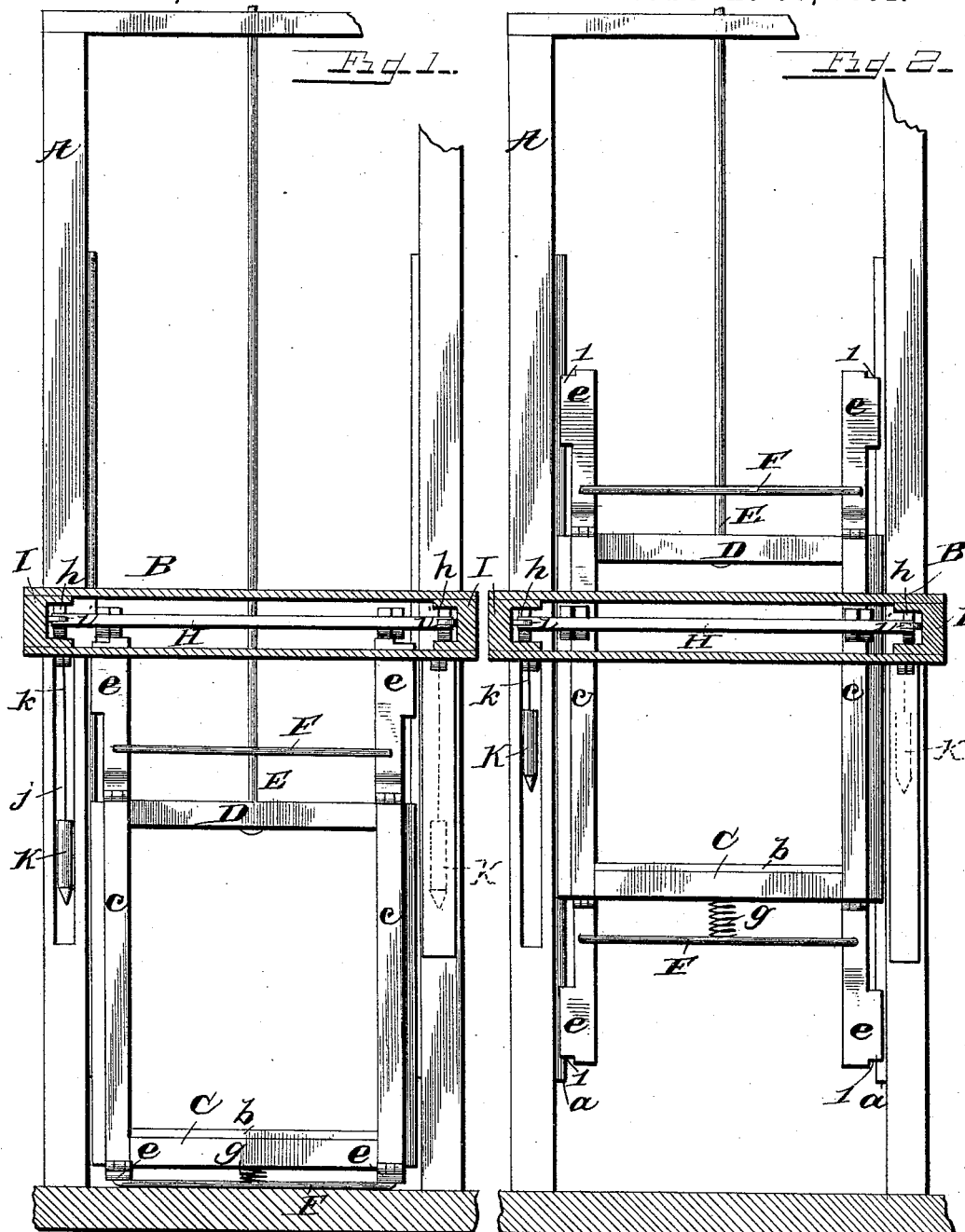


J. D. KELLEY & W. L. WOODS.  
ELEVATOR.

No. 454,945.

Patented June 30, 1891.



WITNESSES;

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*J. D. Kingberg*

INVENTORS

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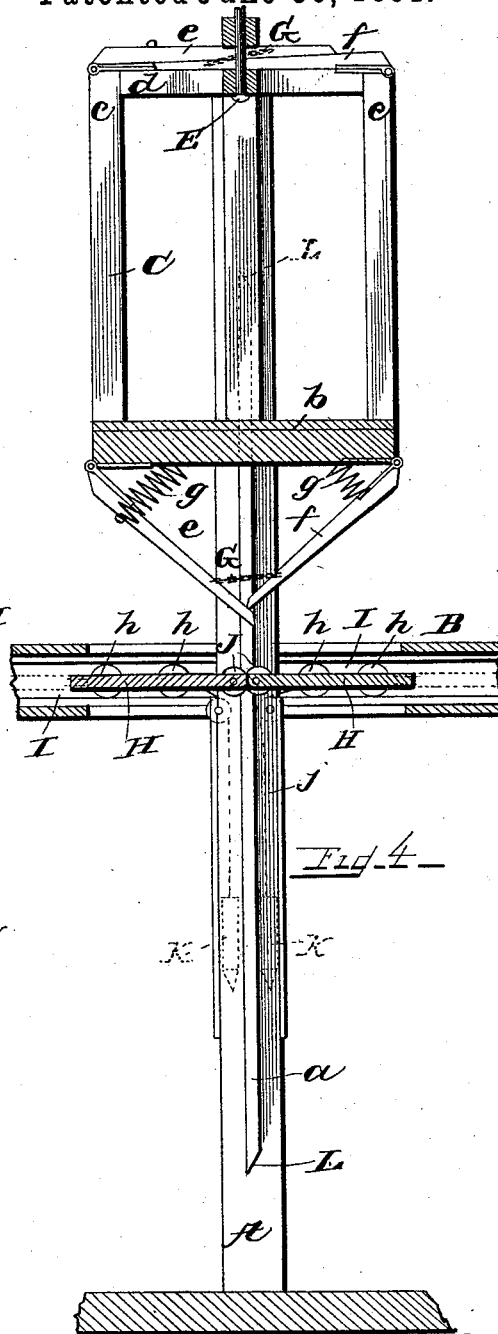
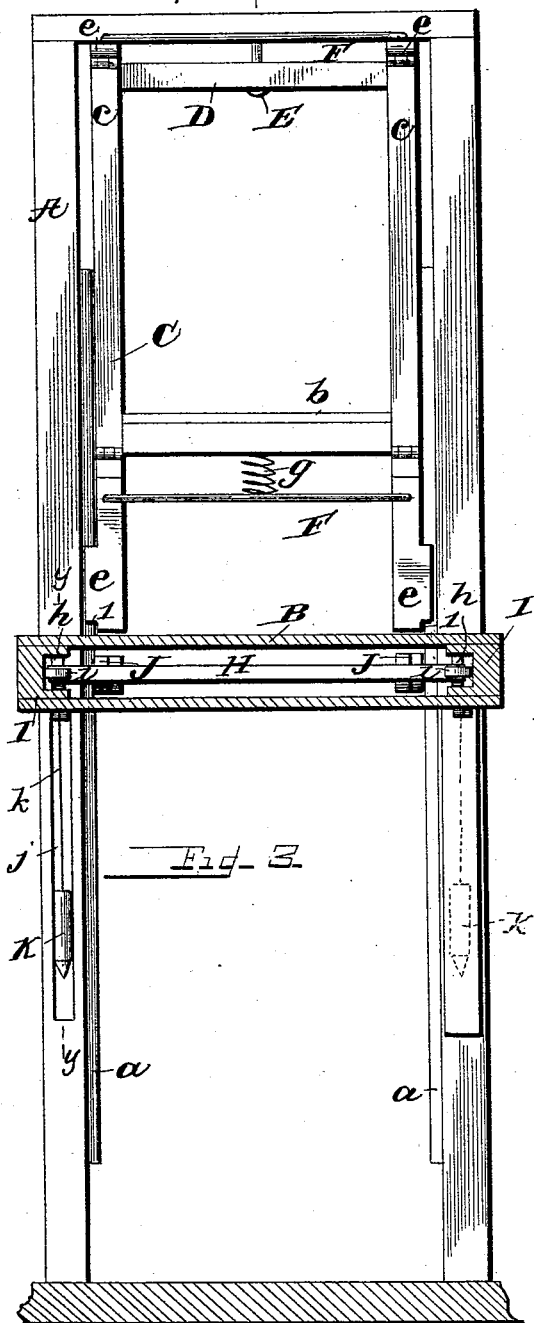
(No Model.)

3 Sheets—Sheet 2.

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WITNESSES,

*G. A. Taubenschmidt*  
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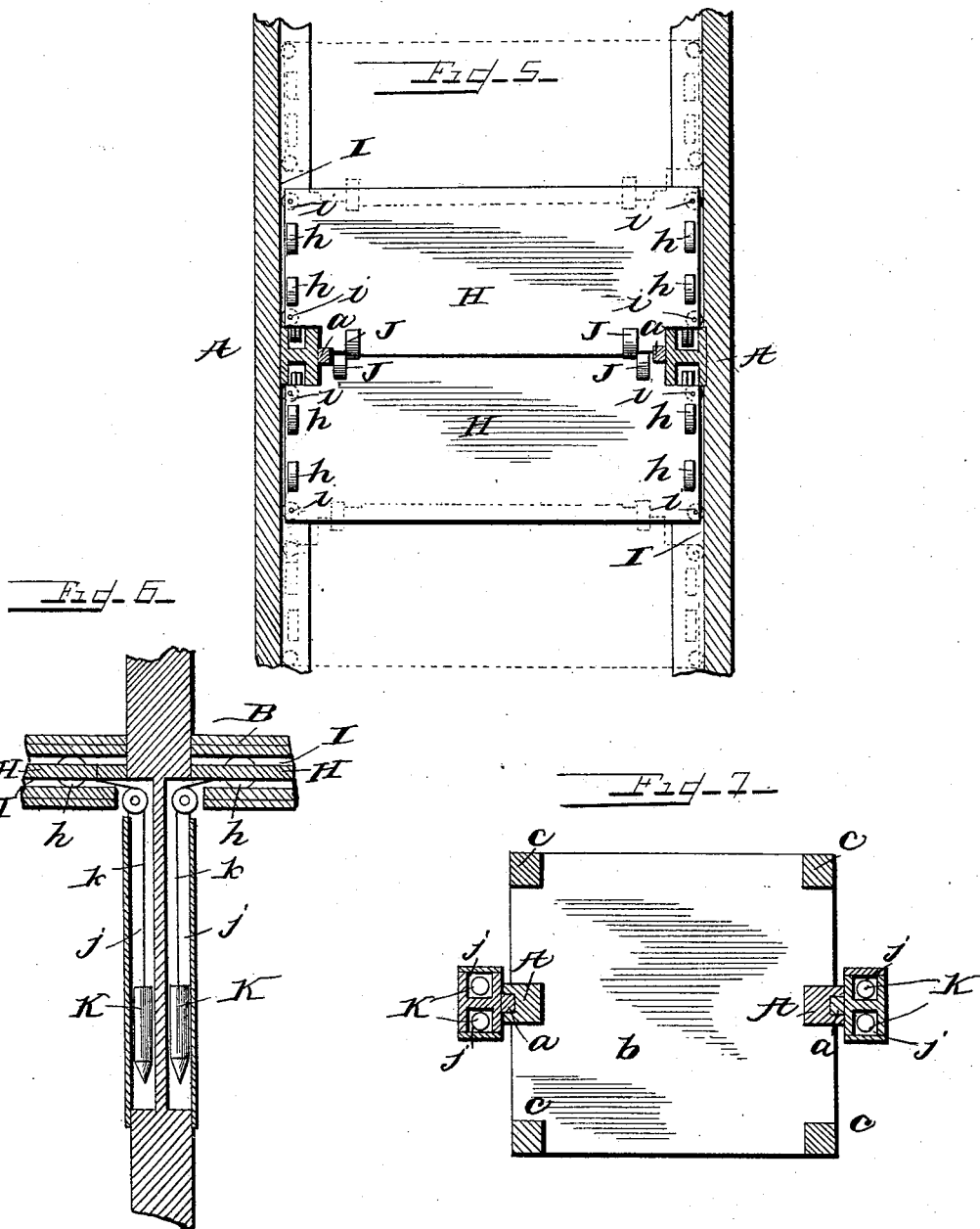
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# UNITED STATES PATENT OFFICE.

JOSEPH D. KELLEY AND WILLIAM L. WOODS, OF BALTIMORE, MARYLAND,  
ASSIGNORS OF ONE-THIRD TO SAMUEL C. HALFPENNY, OF SAME PLACE.

## ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 454,945, dated June 30, 1891.

Application filed February 9, 1891. Serial No. 380,772. (No model.)

*To all whom it may concern:*

Be it known that we, JOSEPH D. KELLEY and WILLIAM L. WOODS, citizens of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Elevators; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to elevators and elevator-shafts, having for its special object improvements in the latter, whereby hatches at the several landings or floors of an elevator-shaft may be automatically opened and closed by passage of the car, thus guarding against accidents and fire.

The invention will be hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, which form part of this specification, Figure 1 represents a front elevation of part of an elevator-shaft with a car in its lowest position; Fig. 2, a similar view showing the car ascending; Fig. 3, the same, showing car in its highest position; Fig. 4, a vertical longitudinal section on line *x x*, Fig. 3; Fig. 5, a plan view of one pair of hatches; Fig. 6, a vertical section on line *y y*, Fig. 3; and Fig. 7, a horizontal sectional view through car and shaft, looking down.

Reference being had to the drawings and the letters thereon, A represents the framing of an elevator-shaft, provided with the usual vertical guides *a*.

B represents one of a series of landings or floors through which the shaft extends; C, the car, of wood or metal, consisting of platform *b*, provided with four vertical corner-posts *c*, joined in pairs at their upper ends by horizontal beams *d*, the latter being tied securely together by yoke D, mortised, or otherwise fastened to the centers of said beams at right angles thereto, affording an attachment for the lift rope or ropes secured to it, as at E.

Hinged to the top and bottom of the car C immediately above and below vertical posts *c* are inclines *e e f f*, the former overlapping the latter, and, together with horizontal beams *d* of the car, forming four triangles when in

operative position, having their apexes recessed, as at I, to receive the guides *a* above and below the car, those above extending up and those below projecting down, as shown in Fig. 2. Inclines *e e* above and below the car overlap those marked *f f*, each pair being joined by a rigid bar F and retained in this relative position by rope or chains G, while the inclines *e e* below are connected with the bottom of car C by coil-springs *g g*, the tendency of which is to raise and hold them against the bottom of the car. Likewise the inclines above always tend to fold down by gravity, both sets being prevented from thus folding as long as guide *a* engages recesses I in their outer ends.

On the several floors or landings of a building equipped with our improved elevator we provide hatches, one pair of which is illustrated in the drawings and marked H H. In order to receive such horizontally-sliding hatches, the building must be specially framed at the elevator-shaft, allowing room for them to slide between ceiling and floor without interference of the joist.

Tracks I I are provided to receive the ends of hatches H H, which in turn are provided with wheels or rollers *h h* for running in said tracks, while the four corners of each hatch are equipped with small friction-wheels *i*, operating in the same plane of the hatch and bearing against the center of tracks I. Other friction-wheels J J are located in the abutting edges of hatches H near their outer ends and in a position that they barely miss touching when the hatches are closed.

In the timber immediately back of guide *a*, constituting part of the framing of the elevator-shaft and extending downward from each floor, are pockets *j*, similar to window-sash-weight pockets, in which are housed weights K at one end of chains or cords *k*, the opposite ends of which are attached to the abutting edges of hatches H, thus keeping them normally closed by gravity of said weights J. Guides *a* may be termed "cut-away guides," from the fact that they do not extend to the extreme top or bottom of the elevator-shaft and are beveled or pointed at their extremities, as shown at L, to aid in

operating the inclines, as will appear by the operation of the device, which is as follows:

For the purposes of illustration we will suppose the car midway between two floors. As it rises, the upward-projecting inclines *eff* come in contact with the hatches guarding the shaft at the floor above, the apex of the triangles *def* striking first midway between the two hatches H H at a point where the upper side of inclines *ef* comes in contact with wheels J J, which greatly reduces the friction between these parts and assists in wedging the hatches apart as the wheels travel along the inclines. The car having passed a floor, hatches H automatically close below it under influence of weights K, and the operation is repeated at each succeeding floor until the top of the shaft is reached. As the car approaches the top the free ends of inclines *ef* pass above the guide *a* and fold by gravity one upon the other, as shown in Fig. 4, their tapering form facilitating in said folding, so that when folded the two occupy only the space that would be required by one of equal thickness from end to end, thus allowing the car to ascend to the extreme top without the necessity of head room or an extension on the roof of the building. Upon descent the process is repeated and the same arms are raised and held in an elevated position by coming in contact with guides *a*, the beveled end thereof assisting in the operation. Having thus passed all landings, automatically opening and closing their respective hatches in succession, the inclines *ef* below car C disengage guides *a* by dropping below it, when springs *g* are allowed to exert themselves, thus folding the inclines against the bottom of the car C *e* upon *f*, after which the same springs serve to cushion the car upon the bottom of the elevator-shaft.

Having thus fully described our invention, what we claim is—

1. The combination of an elevator-car having folding inclines above and below, guide-posts having strips adapted to extend between the ends of the inclines to hold said inclines in a raised position, the strips being cut away at the upper and lower limits of travel of the car to allow the inclines to fold, and horizontally-movable hatch-doors adapted to be opened by the inclines.

2. The combination of an elevator-car having folding inclines above and below, guide-posts having strips adapted to extend between the ends of the inclines to hold them in a raised position, the strips being cut away

at the upper and lower limits of travel of the car to allow the inclines to fold, springs for folding the inclines when disengaged from the strips, and horizontally-movable hatch-doors adapted to be opened by the inclines.

3. The combination of an elevator-car having folding inclines above and below, guide-posts having strips adapted to extend between the ends of the inclines to hold them in a raised position, the strips being cut away and beveled at their ends to allow the inclines to fold up on the car when disengaged from said strips, and horizontally-movable hatch-doors adapted to be opened by the inclines on the car.

4. The combination of an elevator-car having folding inclines above and below, consisting of overlapping bars hinged to the outer edges of the car, guide-posts having strips adapted to extend between the ends of the inclines to hold them in a raised position, the strips being cut away at their ends to allow the inclines to fold when disengaged from said strips, and horizontally-sliding counterbalanced elevator-hatch doors adapted to be opened by the inclines.

5. The combination of an elevator-car having folding inclines above and below, the latter consisting of overlapping bars recessed at their inner ends and hinged at their outer ends to the corners of the car, guide-posts having vertical strips adapted to extend between the recessed ends of the inclines to hold them in a raised position, the strips being cut away at their ends to allow the inclines to fold when disengaged from said strips, and horizontally-sliding hatch-doors operated by the inclines on the car.

6. The combination of an elevator-car having folding inclines above and below, consisting of overlapping recessed tapering bars hinged to the outer edges of the car, guide-posts having vertical strips adapted to extend between the recessed ends of the inclines to hold them in a raised position when thus engaged, the strips being cut away and beveled on their ends to allow the inclines to fold upon passing the ends of said strips, and horizontally-sliding counterbalanced hatch-doors adapted to be opened by the inclines.

In testimony whereof we affix our signatures in presence of two witnesses.

JOSEPH D. KELLEY.  
WILLIAM L. WOODS.

Witnesses:

JNO. T. MADDOX,  
JOHN S. HULL.