

No. 810,873.

PATENTED JAN. 23, 1906.

W. E. S. MACKAY.  
DOOR FOR LIFTS.

APPLICATION FILED APR. 15, 1905.

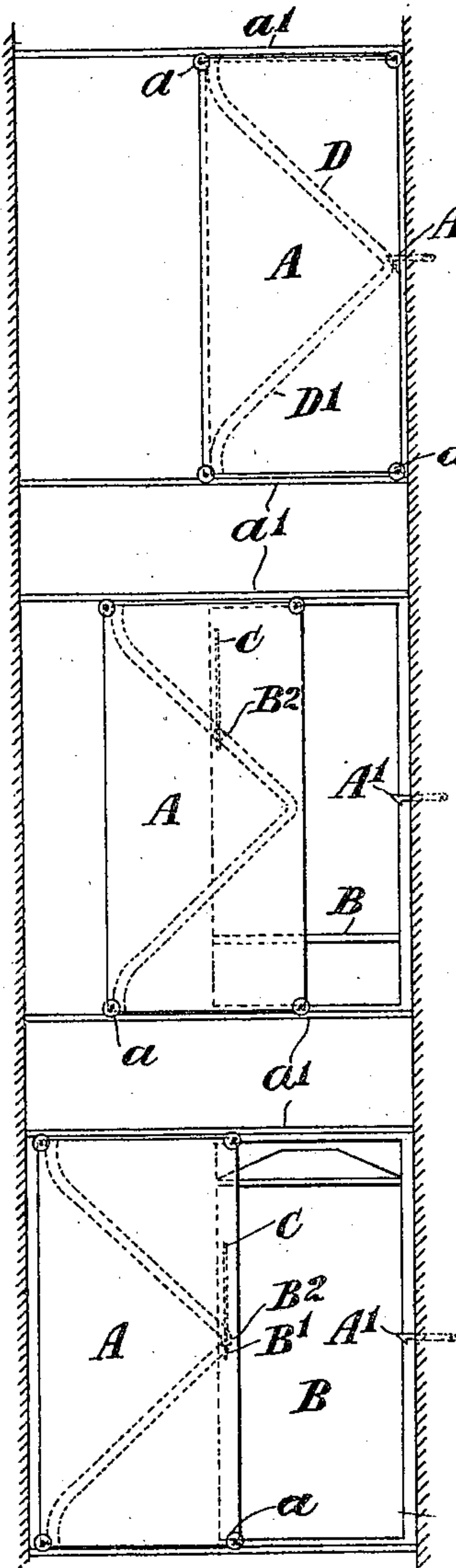


Fig. 1.

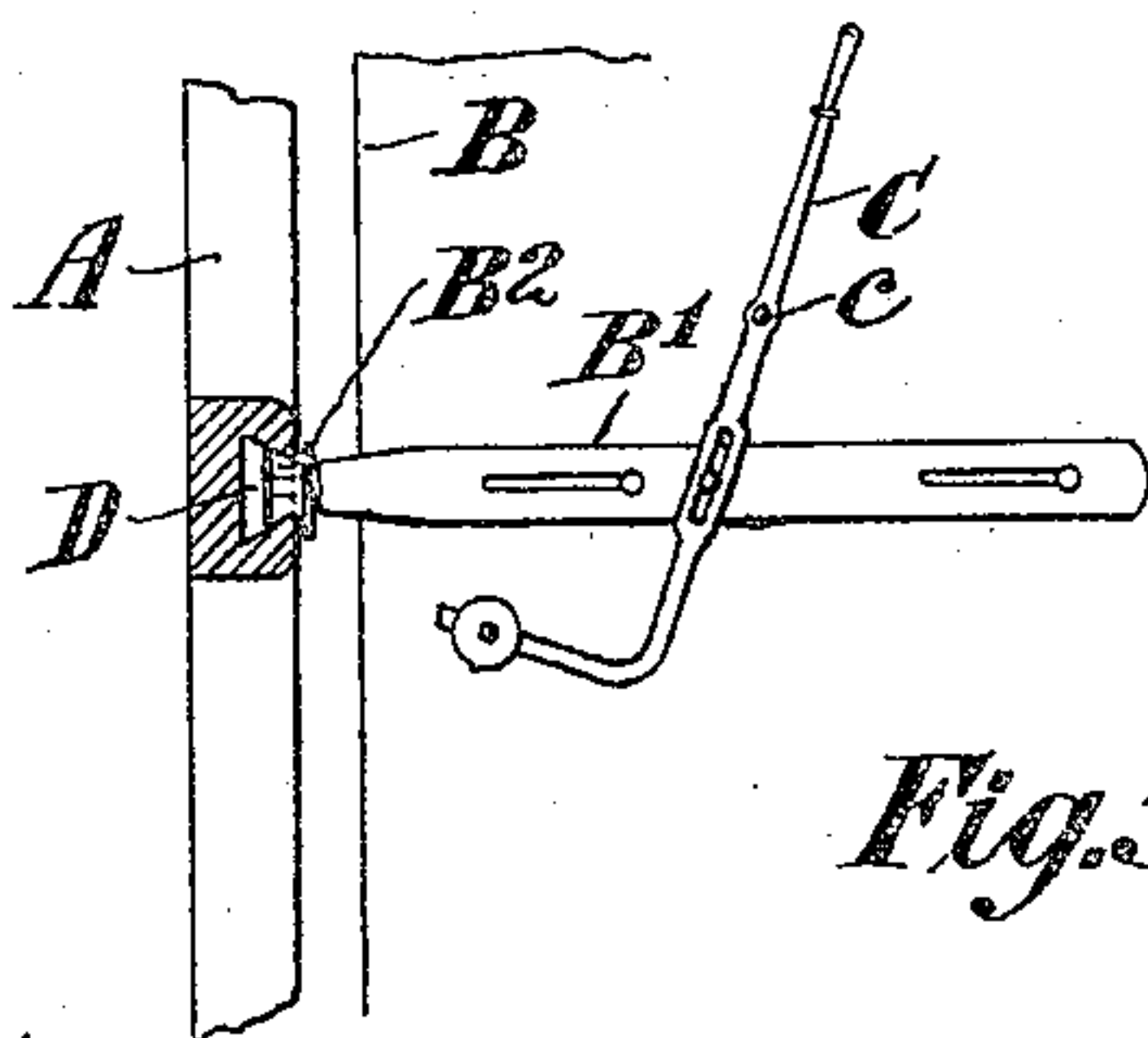


Fig. 5.

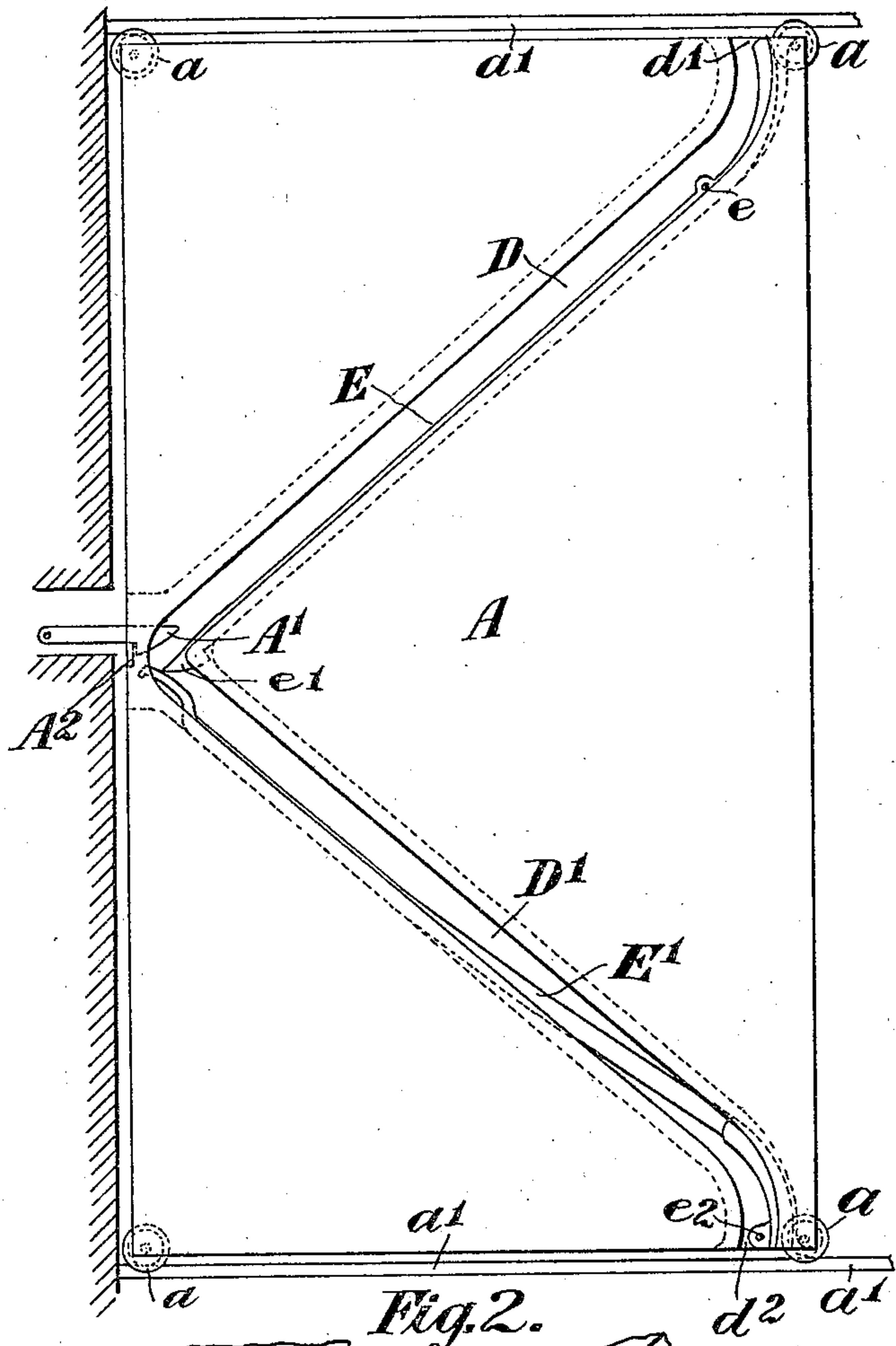


Fig. 2.

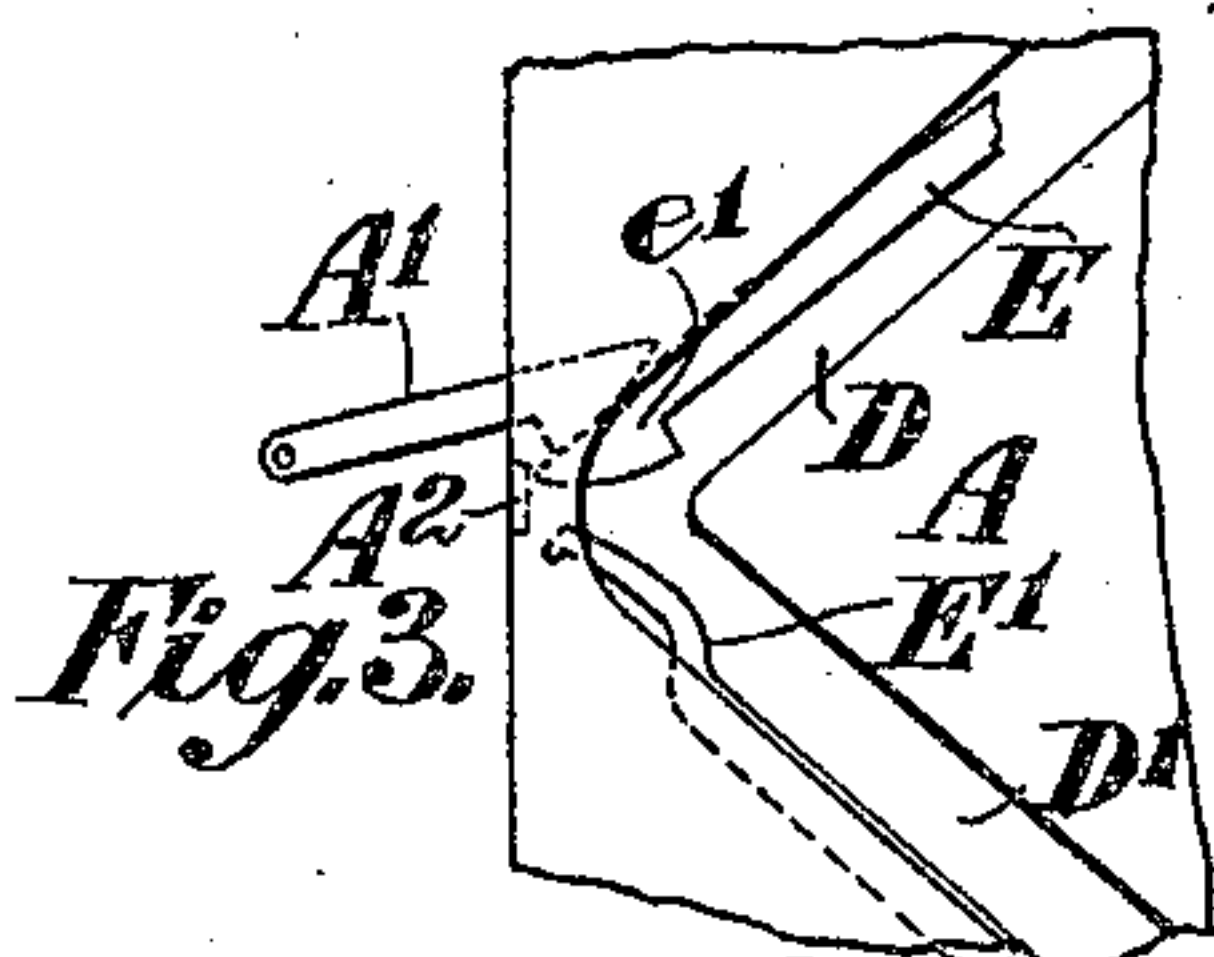


Fig. 3.

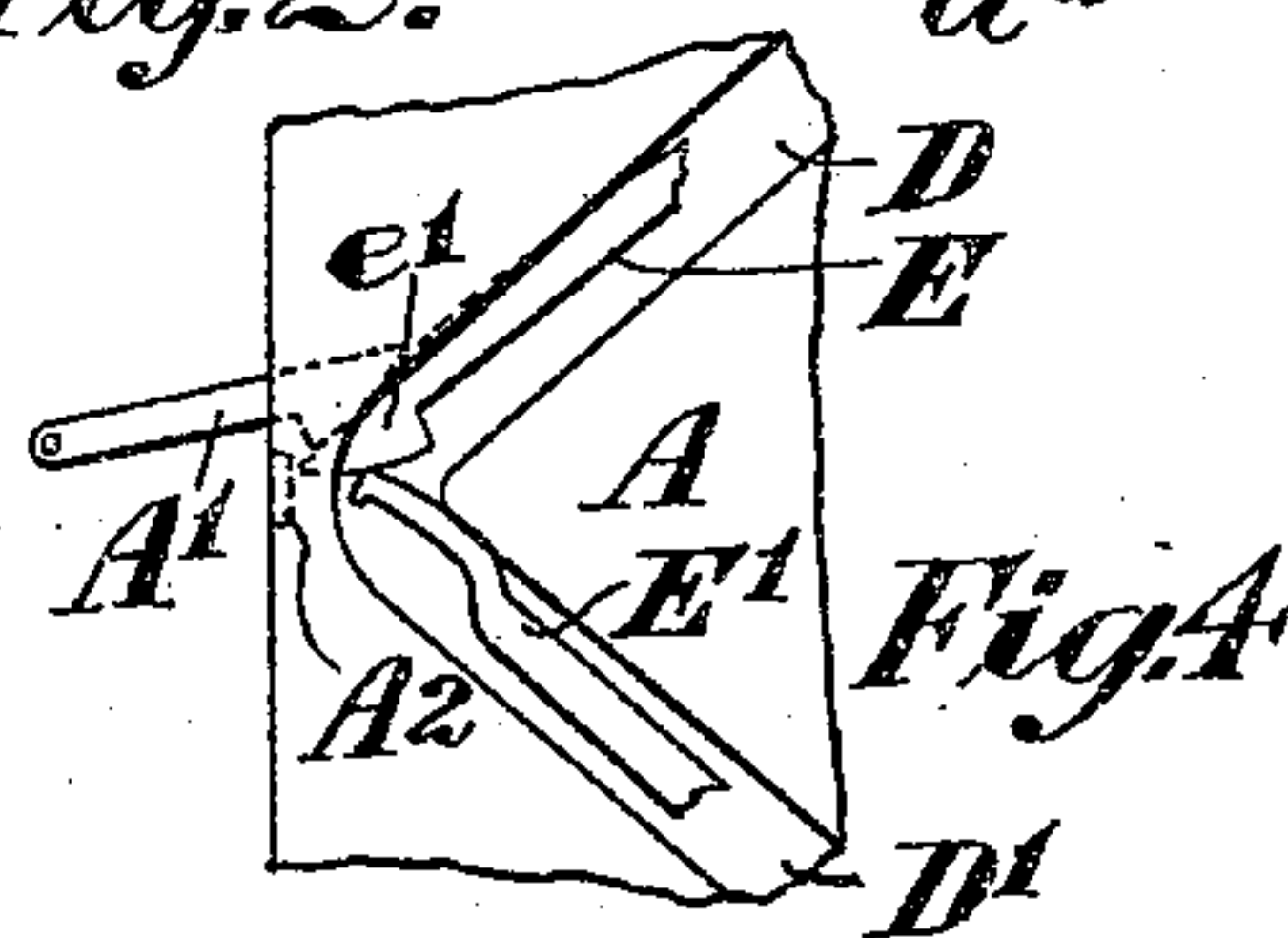


Fig. 4.

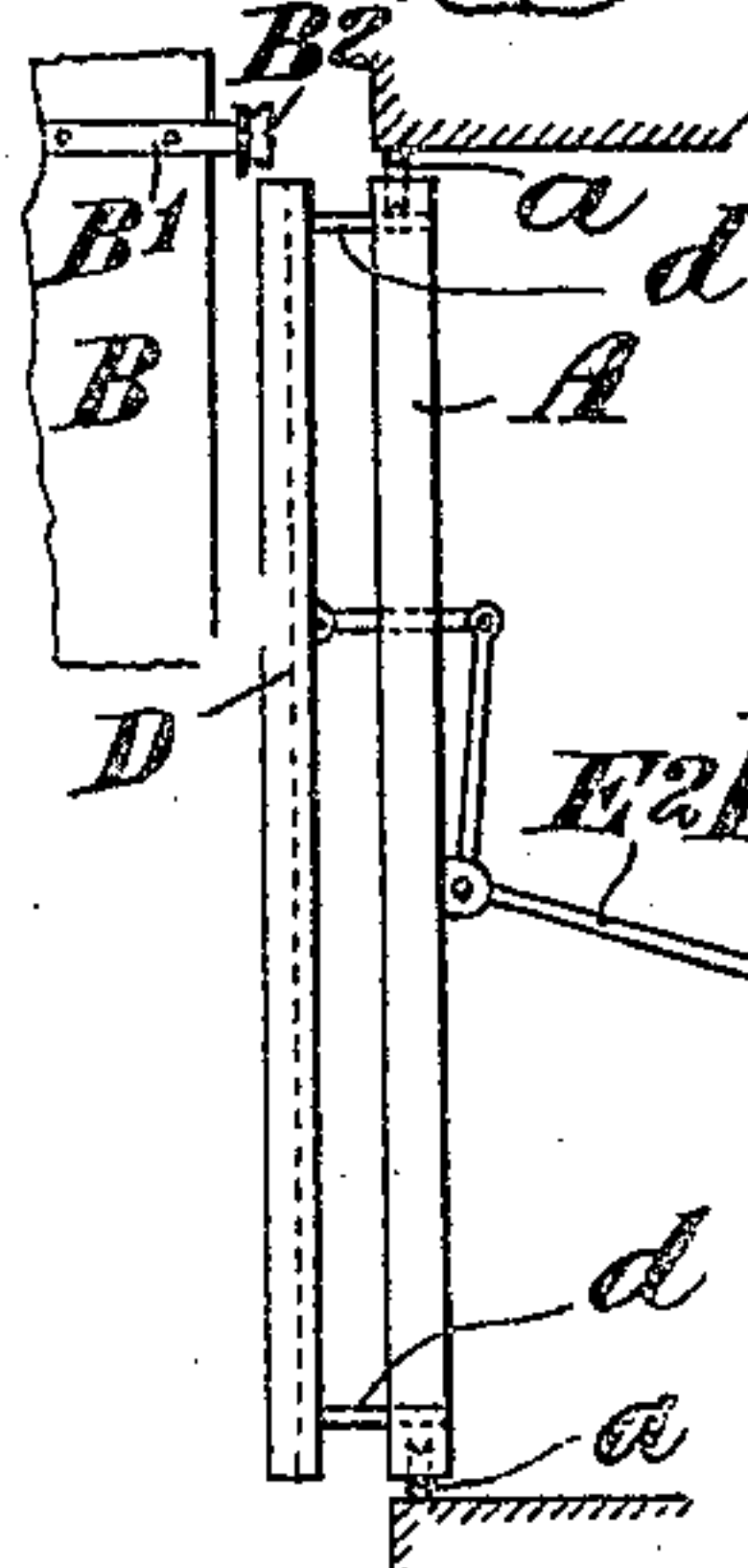


Fig. 6.

Witnesses:-  
E. R. Peck.  
C. A. Wright, Jr.

Inventor:-

W. E. S. Mackay  
Per Robert Peck  
att'y



# UNITED STATES PATENT OFFICE.

WILLIAM ELIGAH STUBBORN MACKAY, OF SOUTH YARRA, VICTORIA,  
AUSTRALIA.

## DOOR FOR LIFTS.

No. 810,873.

Specification of Letters Patent.

Patented Jan. 23, 1906.

Application filed April 15, 1905. Serial No. 255,851.

*To all whom it may concern:*

Be it known that I, WILLIAM ELIGAH STUBBORN MACKAY, engineer, a subject of the King of Great Britain and Ireland, residing at No. 286 Toorak road, South Yarra, in the British State of Victoria, Commonwealth of Australia, have invented new and useful Improvements in and Connected with Doors for Lifts, Lift-Shafts, and for other Purposes, of which the following is a specification.

This invention relates to improvements in and connected with doors for lifts, lift-shafts, and for other purposes, and has reference mainly to the doors leading to passenger and other lifts; and it consists of means whereby the doors are unlocked and opened and closed and locked by certain devices on the lift or cage being brought into contact with certain devices on the doors while the cage is in motion, and thus the door or doors are, so to speak, automatically unlocked and opened in order that a passenger may get into or leave the cage when it stops at a floor or landing, and again the door is automatically closed and locked as the cage starts to travel up or down from said floor or landing. If so desired, the device on the cage can be so placed as to miss the door at any floor or landing, and so not operate it.

The invention will now be fully described, aided by a reference to the accompanying sheet of drawings, in which—

Figure 1 shows by an elevation the doors from three flats leading to a lift-shaft. At the topmost flat the sliding door is closed, at the next the door half open, and at the lowermost the door is fully open. Fig. 2 is a rear view of the sliding door, drawn to a larger scale, and showing the operative grooved path and the levers for releasing the door-latch, which is in its locked position. Figs. 3 and 4 are details of the operative ends of the latch-releasing levers, Fig. 3 showing the latch as opened or lifted by the lever in the upper groove and Fig. 4 as opened or lifted by the lever in lower groove; Fig. 5, a view of the sliding door and showing the section of the groove with the controlling-roller in it as carried by the sliding bar within cage and the levers for operating the sliding bar; Fig. 6, a sectional view of a door arranged so as to be operated from such as a mine-drive or landing.

In constructing and arranging the inven-

tion each door A is supported on rollers *a* and capable of sliding on rails *a'* in front of and away to the side of the opening in the cage, lift, or carriage B. Also each door-frame has a pivoted latch A', which engages a catch-plate A<sup>2</sup> in one edge of the door.

Within the cage, lift, or carriage is a sliding bar B', on the front end of which a roller B<sup>2</sup> is centered, and such sliding bar B' is attached to a weighted hand-lever C, which is centered at *c*, and it is by means of said hand-lever that the roller B<sup>2</sup> is either placed in its outward position to take into a grooved path D D', formed in the back of the door, or be placed at its inmost position to be clear of said grooved path, or other means can be provided for operating said sliding bar B'. Said grooved path D D' may be made separate and be secured to the door, as shown in Fig. 6, and in both cases it is somewhat in the form of a broad V lying on its side with the apex of the V nearest the edge of door which opens, and which edge is furnished with the catch-plate A<sup>2</sup>, while the grooved path is preferably of a dovetail section, as shown in Fig. 5.

In each of the upper and lower grooved paths D D' of the V-groove is a pivoted latch-releasing lever, (marked E and E', respectively,) whose latch-lifting ends practically meet at the apex of the grooved path, and said meeting ends are designed to release the door-latch A' when the levers are canted or worked just as the tapered roller B<sup>2</sup> enters either the upper or lower end of the grooved path and presses the curved end of the lever it is upon against the inner wall of groove. The upper lever E is centered at *e*, and the lower lever E' is centered at *e'*, each within its grooved path.

When the roller B<sup>2</sup> enters the grooved path D at the top, it pushes the curved portion of lever E back, while its fore end *e'* lifts the door-latch A' clear of the catch-plate A<sup>2</sup>, as shown in Fig. 3, and again when said roller enters the lower grooved path D' at its bottom end it lifts or cants the lever E', which in turn raises the latch A', through the medium of the end part *e'* of the upper lever E, as shown in Fig. 4.

As an alternative, and especially for mining-cages, the doors A may be arranged with the grooved path D D' movably supported by pins *d* thereon and with the position of



said path controlled by a weighted lever  $E^2$ , as shown in Fig. 6, in order that the said grooved path  $D D'$  may be moved toward the cage B to allow the tapered operating-roller  $B^2$  to enter the grooved path  $D D'$  and work the door, in place of the sliding bar within the cage B having to be moved to meet the grooved path. Said V-shaped grooved path  $D D'$  is rounded and slightly bell-mouthed upward and downward, respectively, at its top and bottom ends  $d'$   $d^2$ , respectively, where the roller  $B^2$  enters it, and by the ascending roller entering at  $d^2$  and traveling through the lower inclined grooved path  $D'$  it forces or slides the door open and again upon turning about the apex of the grooved path the door will travel in the opposite direction, as the roller now forces or slides the door A to its closed position and then passes from the grooved path D through its upper curved end  $d'$  and afterward (in a lift) enters the next door and repeats the operation, as just described.

These means or appliances may be applied either to framed or solid lift-doors and may be modified to suit those which are built in lazy-tongs form or collapsible or those which are constructed in narrow vertical sections and hinged or otherwise secured together in order that they may be slid or passed about a curved corner. The invention can also be employed for the doors of carriages, tram-cars, or for any other sliding or fireproof doors where public safety requires a door which is capable of being controlled by devices such as herein explained in order to allow of its being opened at any desired moment, and generally when the cage, carriage, or tram-car or the like comes to a standstill.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination, a door-framing, a slidable door having a V-shaped path or runway arranged longitudinally thereof with its apex adjacent an edge of the door, means for locking the door to the framing, levers longitudinally arranged in said runway and extending to the apex thereof to act on said means to release the door, the outer ends of said levers being bent, and a cage movable past said door and having a projection to move in said runway for opening and closing the door and arranged to engage a lever in the runway for releasing the door, substantially as described.

2. In combination, a door-framing, a slid-

able door, a pivoted latch for locking the door to the framing, said door provided with a longitudinal V-shaped groove or runway having its apex adjacent the edge of the door and said latch, the opposite ends of the runway being open, levers longitudinally arranged in the runway and extending approximately from the open ends of the runway to the apex thereof, respectively, each lever free at its inner end to engage and lift said latch and fulcrumed to swing transversely of the runway and arranged adjacent an open end of the runway to be engaged by a projection entering said end to be swung thereby to release the latch, and a cage having a projection to move longitudinally through the runway and open and close the door, substantially as described.

3. In combination, a door-framing, a slidable door having a V-shaped groove arranged longitudinally of the door and dovetailed in cross-section, said groove having vertically-disposed open opposite ends adjacent the top and bottom of the door and having its apex arranged adjacent an edge of the door, a swinging latch arranged adjacent said apex for locking the door, a pair of swinging levers arranged longitudinally in said groove and extending approximately from the open ends thereof, respectively, to the apex to engage and swing said latch, and a cage having a tapered projection to enter said groove and close and open the door and to swing said levers, substantially as described.

4. In combination, a door-framing, a slidable door having a V-shaped runway arranged longitudinally thereof with opposite open ends adjacent the top and bottom portions of the door, respectively, and having its apex arranged adjacent the vertical edge of the door, a swinging latch for locking said door and arranged adjacent said apex, a pair of bent swinging levers arranged longitudinally in said runway and extending approximately from open ends thereof, respectively, to the apex to engage and swing said latch, and a cage having a projection to move in said groove to open and close the door and to engage and swing said levers.

In witness whereof I have hereunto set my hand in presence of two witnesses.

WILLIAM ELIGAH STUBBORN MACKAY.

Witnesses:

BEDLINGTON BODYCOURT,

N. J. T. THOMPSON.