

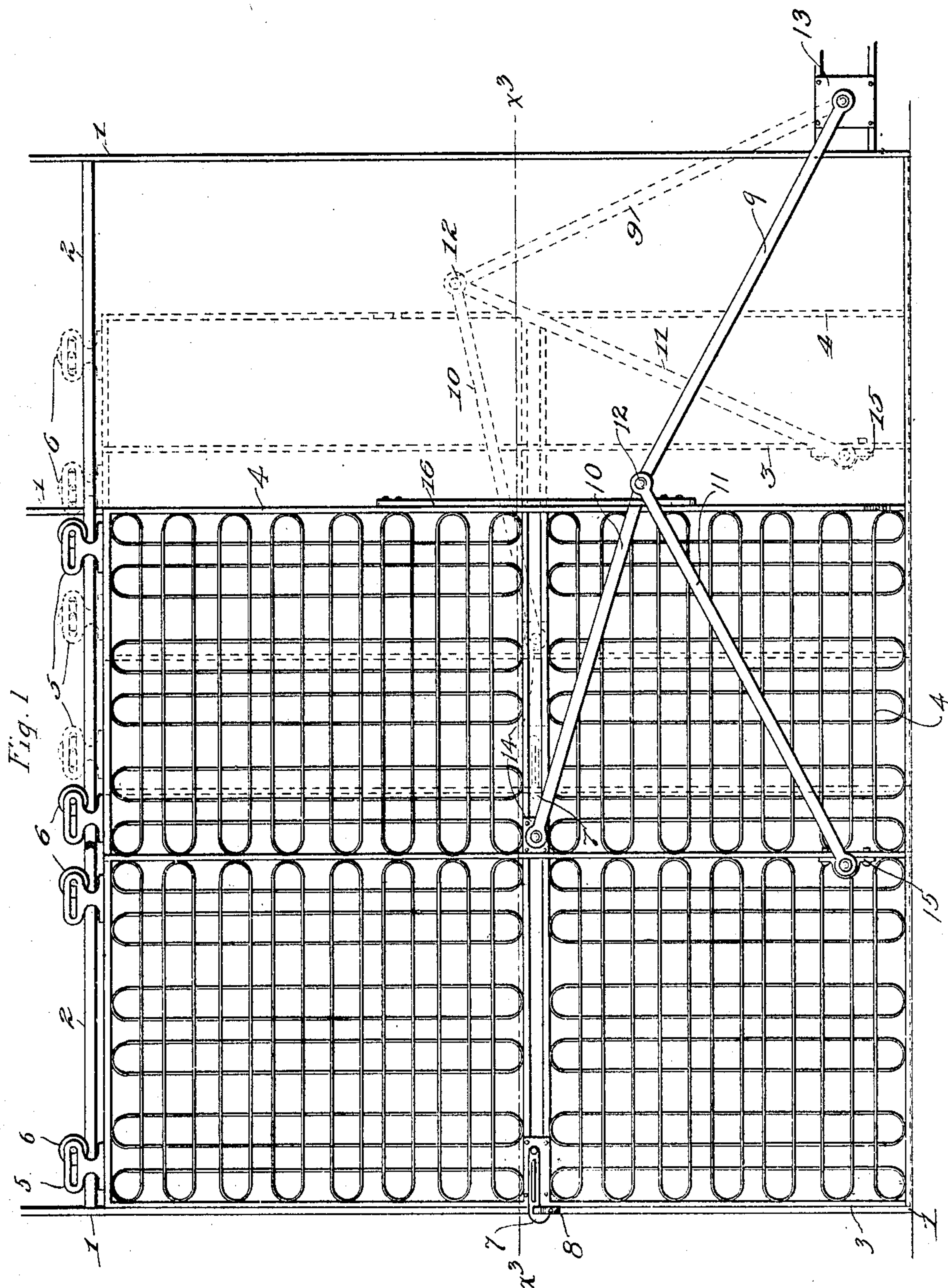
No. 885,534.

PATENTED APR. 21, 1908.

F. G. SCHULDT.
DOOR MOVEMENT REGULATOR.

APPLICATION FILED FEB. 6, 1907.

2 SHEETS—SHEET 1.



Witnesses:
L. L. Simpson.
Malie Hoel.

Inventor,
Frederick G. Schuldt.
By his Attorneys,
Williamson Michaud

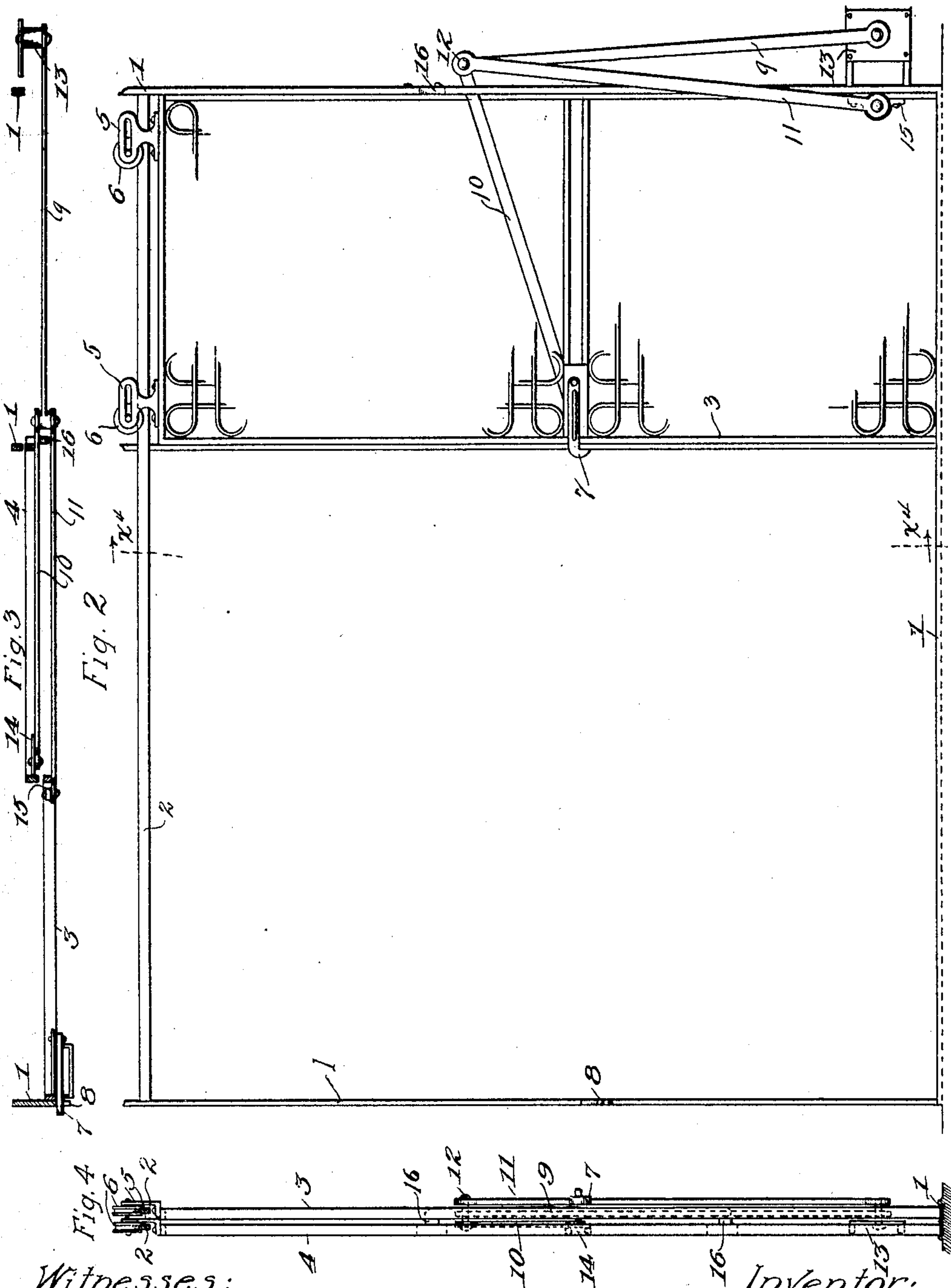
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UNITED STATES PATENT OFFICE.

FREDERICK G. SCHULDT, OF ST. PAUL, MINNESOTA, ASSIGNOR OF ONE-HALF TO THE HERZOG
IRON WORKS, OF ST. PAUL, MINNESOTA, A CORPORATION OF MINNESOTA.

DOOR-MOVEMENT REGULATOR.

No. 885,534.

Specification of Letters Patent.

Patented April 21, 1908.

Application filed February 5, 1907. Serial No. 355,805.

To all whom it may concern:

Be it known that I, FREDERICK G. SCHULDT, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Door-Movement Regulators; and I 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.

My invention relates especially to improved means for regulating the sliding movements of doors such as used in connection with elevators, and has for its object to simplify the construction and improve the operation of such device.

The above invention consists of the novel devices and combinations of devices herein after described and defined in the claims.

In the accompanying drawings which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings; Figure 1 is a view in elevation looking at the inner side of an elevator door and showing also a portion of the elevator shaft and illustrating my improved door movement regulator. Fig. 2 is a view corresponding to Fig. 1, but showing the door sections in different positions, some parts also being broken away. Fig. 3 is a horizontal section taken approximately on the line $x^3 x^3$ of Fig. 1, and Fig. 4 is a vertical section taken on the line $x^4 x^4$ of Fig. 2.

That portion of the frame-work of the elevator shaft, which is provided with the door openings, is indicated by the numeral 1. Above each door opening 1 are the usual laterally spaced door supporting rails 2, which rails, of course, extend to one side of the door opening.

There are two door sections 3 and 4 preferably provided at their upper ends with hanger brackets 5 and rollers 6 mounted to run on the respective rails 2, also preferably the door section 3 is provided with a latch 7 that is adapted to engage a lug 8 on one of the upright bars of the elevator shaft 1 to lock the door sections in the closed position shown in Figs. 1 and 3. This much is standard elevator construction.

My invention involves the use, as a door movement regulator, of a three armed toggle, one arm of which is pivoted to a relatively fixed base or support, and the other two

arms of which are pivotally attached one to each of the sliding door sections. This three armed toggle, as shown in the drawings, is made up of the three metal straps or rods 9, 10 and 11, each of which constitutes an arm thereof. The said three arms lie in different vertical planes, and are pivotally connected at 12. The arm 9 is pivotally connected at its lower end to a fixed block 13 rigidly secured to the frame-work 1 of the elevator shaft. The free end of the arm 10 is pivotally attached to a block 14 secured to the door section 4 near the outer edge thereof. The free end of the arm 11 is pivotally attached to a bearing 15 secured to the door section 3 near the rear edge thereof. The door sections 3 and 4 are laterally offset sufficiently to permit the toggle arm 10 to work freely between the two door sections; and to guide the said arm 10 laterally, the said door section 4 is provided at its inner edge with a vertically extended laterally offset guide strap 16.

It will be noted that the three arms 9, 10 and 11 of the so-called three-arm toggle are approximately the same length. This is made possible by the arrangement described, wherein the arm 10 is pivoted at a relatively high point to the outer edge portion of the one door section, while the arm 11 is pivoted at a relatively low point to the inner edge of the other door section. This provides a door controlling toggle or device that will fold within a minimum of space.

It will be noted that the point of pivotal connection between the arm 10 and the door section 4 is very much higher than the point of pivotal connection between the arm 11 and the door section 3. The point of pivotal connection between the arm 9 and the fixed block or bearing 13 is at the same, or approximately the same, altitude as the said pivotal connection between the arm 11 and door section 3. This latter feature is important, because when the two door sections are moved into their opened positions, the toggle arms 9 and 11 assume the positions shown in Fig. 2. When the door sections are in their opened positions, as shown in Fig. 2, they are moved into transverse alinement with each other. When the door sections are moved into their closed positions, that is into positions to close the corresponding door opening, as shown in Fig. 1, the door section 3 will be moved twice as far as the door section 4, so that the

said two door sections are spread out, as it were, to close the said door opening. This accelerated movement of the door section 3 over that of the door section 4 is due to the arrangement of the three arms of the toggle whereby the arm 10 is always much nearer to an extended dead center, with respect to the arm 9 than is the arm 11. The dotted lines in Fig. 1 indicate the intermediate positions of the two door sections and of the three armed toggle. As already stated, the full lines in Fig. 1 show the door in its closed position, and Fig. 2 shows the door in its open position.

The door movement regulator above described is of very small cost, and in practice has been found highly efficient for the purposes had in view. The invention relates to what is usually designated as sliding doors, but this statement is used in a broad sense to include doors that are mounted to move edgewise as distinguished from those that are mounted to swing on hinges.

What I claim is:

1. The combination with a pair of sliding door sections, of a three armed toggle, one

arm of which is pivotally attached to a relatively fixed support, another arm of which is pivotally attached to the outer edge portion of the one door section at a relatively high point, and the other of which is pivotally attached to the inner edge portion of the other door section at a relatively low point, substantially as described.

2. The combination with the frame-work of an elevator shaft, of a pair of sliding doors 3—4 suitably mounted thereon, and a three armed toggle 9—10—11, the arm 9 being pivotally attached at 13 to a relatively fixed portion of said frame-work, the arm 10 being pivotally attached at 14 to the outer edge portion of said door section 4 and the said arm 11 being pivotally attached to said door 3, the said door 4 having a vertical guide bar 16 coöperating with said arm 10, substantially as described.

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

FREDERICK G. SCHULDT.

Witnesses:

H. T. FISHER,
L. CASE.