

E. O. VANDEMAR.
FIRE DOOR FOR ELEVATORS.
APPLICATION FILED SEPT. 26, 1910.

983,465.

Patented Feb. 7, 1911.

2 SHEETS—SHEET 1.

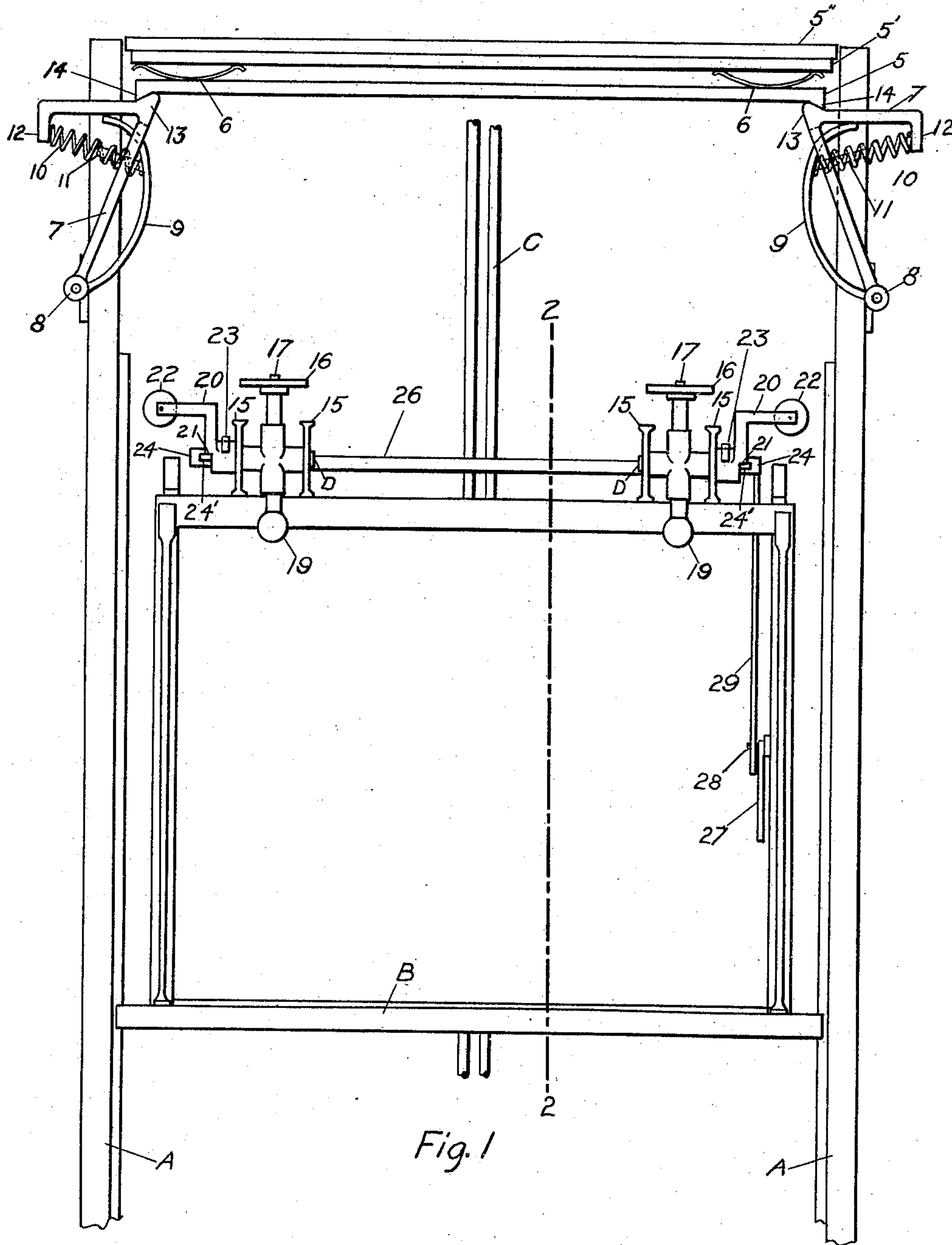


Fig. 1

Witnesses
F. A. Bullington
J. H. Trumbo

Inventor
Edmund O. Vandemar
by R. Wright
Attorney

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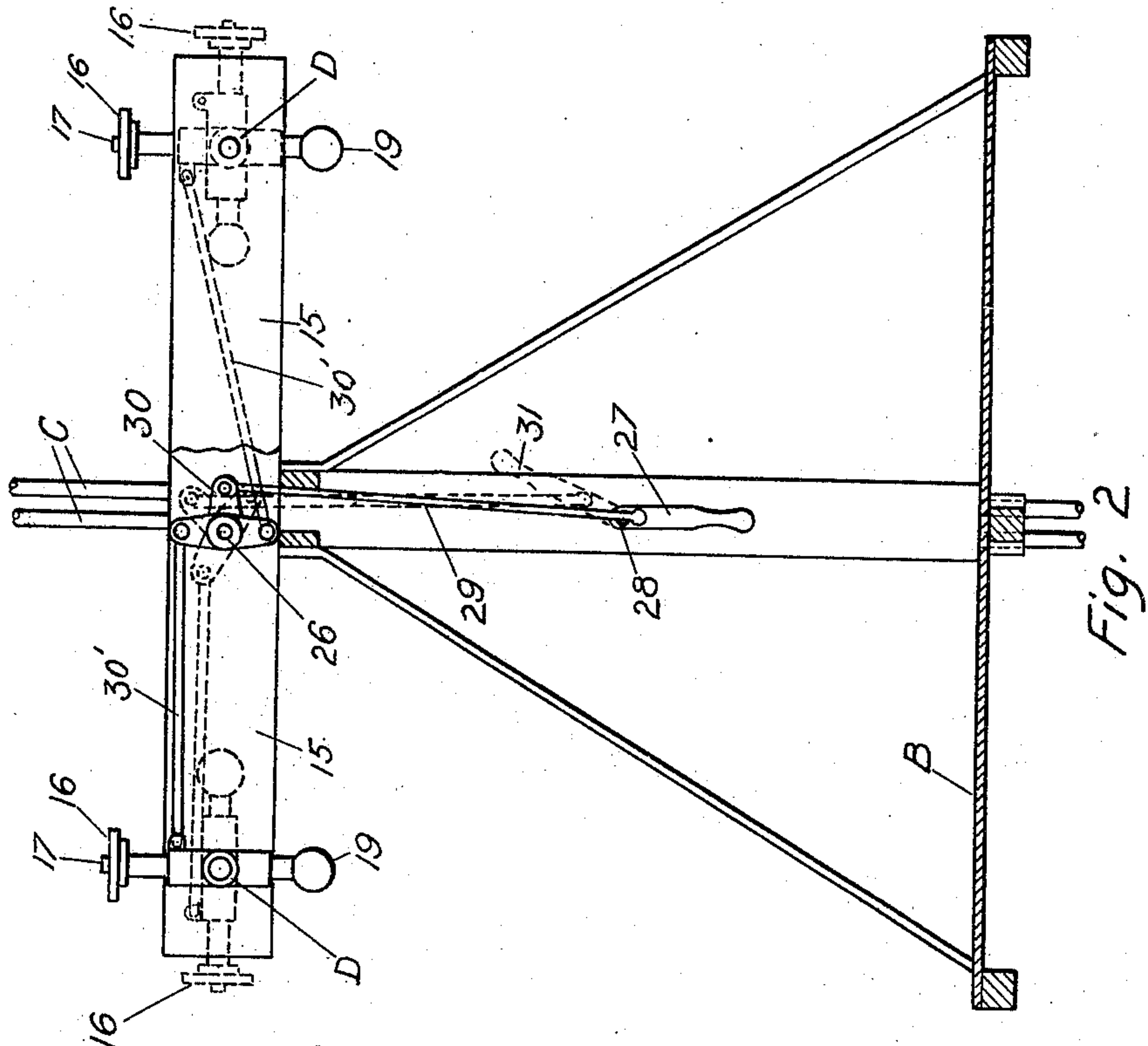


Fig. 2

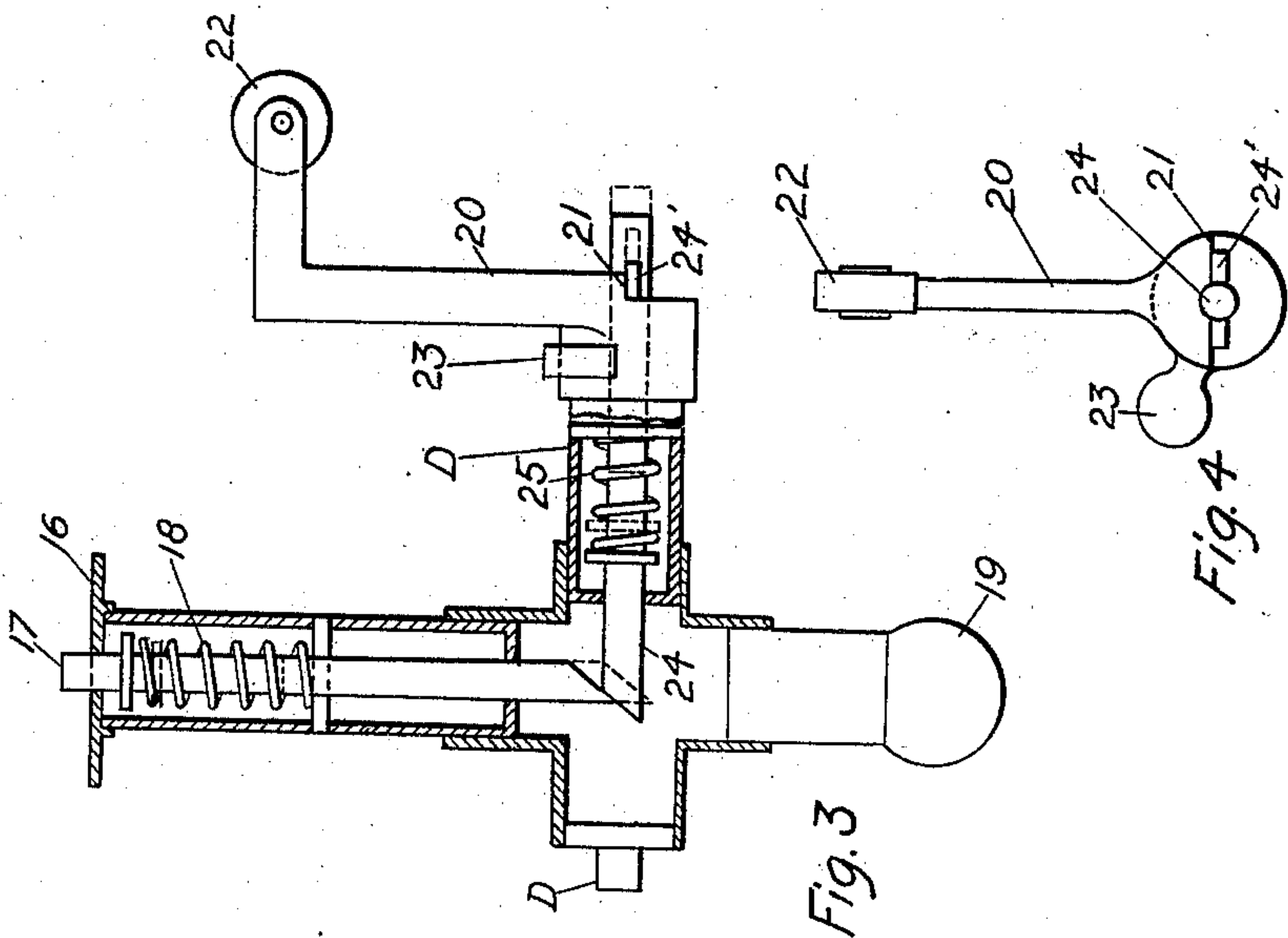


Fig. 3

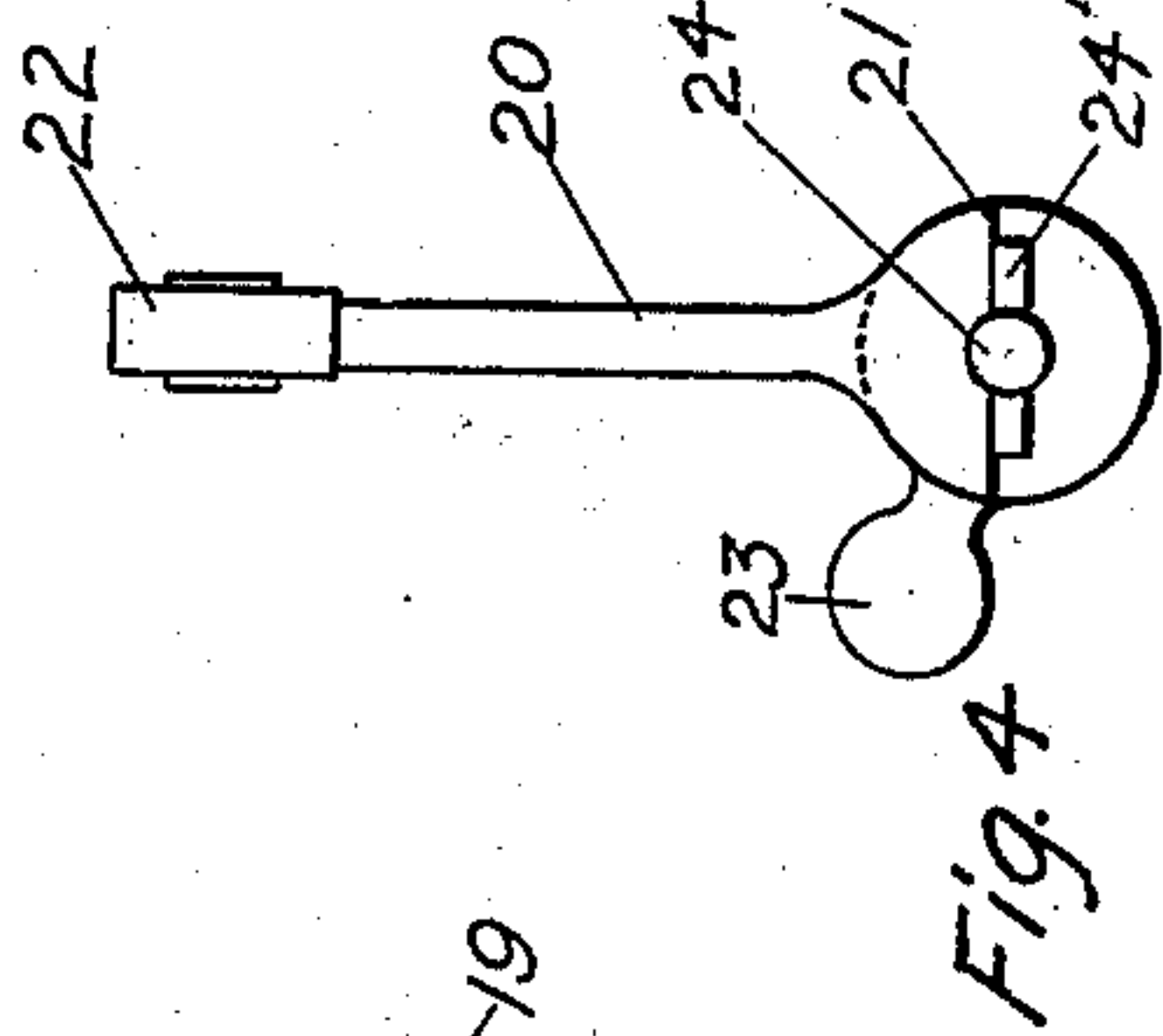


Fig. 4

Witnesses
F.A. Bullington
J.H. Trumbo

Inventor
Edmund O. Vandemar
by R. C. Wright
Attorney

UNITED STATES PATENT OFFICE.

EDMUND O. VANDEMAR, OF PORTLAND, OREGON.

FIRE-DOOR FOR ELEVATORS.

983,465.

Specification of Letters Patent.

Patented Feb. 7, 1911.

Application filed September 26, 1910. Serial No. 583,839.

To all whom it may concern:

Be it known that I, EDMUND O. VANDEMAR, a citizen of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have invented a new and useful Improvement in Fire-Doors for Elevators, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to the class of fire or trap doors used to cover elevator hatches.

The object of my invention is to provide such a fire door or cover for each floor hatch of the building, and means upon the elevator cage to raise all the doors to a position where they will not interfere with the operation of the elevator, and to lower them to cover the hatches when desired. I attain these objects as well as other advantages, by the construction, combination and arrangement of parts illustrated in the accompanying drawings, which form a part hereof.

Figure 1 is a front elevation of my device showing the doors or traps suspended above, and the elevator cage provided with the mechanism to raise or lower the doors. Fig. 2 is a side elevation (partly in section on the line 2—2), of the elevator cage shown in Fig. 1, with the mechanism thereon. Fig. 3 is a front sectional view of the tripping mechanism in detail, as shown in Fig. 1, but on an enlarged scale. Fig. 4 is an end view in detail of the tripper arm shown in Fig. 3.

Like numerals and letters refer to like parts throughout the views.

A is an elevator shaft.

B is an elevator cage within the shaft A and provided in the usual manner with hoisting cables C.

The shaft A is provided with a series of fire doors or traps 5—5'—5'' being one for each floor hatch and decreasing in lateral mensions from the uppermost one downward. The floor hatches are also of decreasing dimensions from the uppermost one downward. The next to the lowest door, 5', is provided with buffer springs 6 on its lower surface. Near the ceiling of the uppermost floor and at the four corners of the shaft A, angled catches 7 are pivoted on pivots 8. Curved contact and counterweight arms 9 are pivoted at their lower ends on the pivots 8, their upper ends being free. Rigidly secured to and near the upper ends of the arms 9, extending outwardly of the shaft A and within coil springs 10 are pins 11. The

springs 10 are rigidly secured at one end to dependent arms 12 of the catches 7, the other ends being free on the pins 11. The catches 7 have beveled noses 13 on their upper parts within the shaft A of form and in position to engage beveled edges 14 on the lowest door 5. Upon the four corners of the upper surface of the roof of the cage B are vertical stands 15 rigidly secured to the roof. Rotatable shafts D are mounted in the stands 15. Vertical door supports 16 are rigidly secured on the shafts D. Within the supports 16 are plunger pins 17 beveled at the lower ends. Within the supports 16 are also recoil springs 18 about the plunger pins 17. The supports 16 are provided with balance weights 19 at their lower ends. Angled tripper arms 20 are rotatably mounted on the shafts D near their outer ends. The arms 20 have shoulders 21 at their lower ends and pivoted disks 22 on their upper ends, of form and in position to engage the catch arms 9 when the tripper is in vertical position. The trippers are also provided with counterweights 23, Fig. 4, on their lower ends.

Within the inner end of the shaft D are horizontal pins 24 movable laterally and having keys 24' on one end, of form and in position to engage the shoulders 21 of the trippers 20 when they are placed in position to engage the arms 9 of the catches 7. The pins 24 are beveled on their opposite or inner ends and extend below the plunger pins 17 in position to be engaged by them when they are depressed. Coil springs 25 are placed within the shaft D about the pins 24. Laterally of the center and upon the roof of the cage a shaft 26 is rotatably mounted. On one side of the cage a handle 27 is pivoted on a pivot 28. From a convenient part of the handle 27 a connecting rod 29 extends upward to a bell crank lever 30 which is rigidly secured on the shaft 26. Upon the opposite end of the shaft 26 a similar bell crank lever is rigidly secured but for convenience is not shown in the views. Connecting rods 30' extend from the bell crank levers 30 to connections with the upper parts of each of the supports 16.

It will now be seen that the doors 5—5'—5'' being secured by the catches 7 at the top of the shaft, it is desired to lower them. The handle 27 is moved to the dotted line position 31 Fig. 2 and released. From this position the handle 27 will be auto-

matically returned to a vertical position by
 the gravity action of counterweights 19.
 This operation draws the supports 16 over
 to horizontal position as shown by the
 5 dotted lines in Fig. 2 and allows the keys
 24', then beyond the shoulders 21 of the
 trippers 20, to engage the same and raise
 them to vertical position. The cage is then
 elevated and the disks 22 of the trippers
 10 engage the catch arms 9 pressing them back-
 ward and releasing the doors, which are
 caught on the supports 16, the impact being
 deadened by the buffer springs 6. The doors
 are then lowered, each one remaining on its
 15 proper floor as it reaches the floor hatch.
 After the doors have passed the catches 7
 the arms 9 are pushed out by the recoil
 springs 10 and the weight of the arms causes
 the catches to fall back to the original po-
 20 sition. The impact of the doors also de-
 presses the plunger pins 17 and these force
 out the pins 24 and the keys 24' which re-
 lease the trippers 20 and they fall again to
 horizontal position because of their gravity
 25 weights 23.

It will further be seen that with the
 mechanism left in the position last de-
 scribed, the doors may be raised by elevating
 the cage, which picks them up on the sup-
 30 ports 16 one by one, and the doors engaging
 the arms 9 press the catches 7 back until
 the doors are above them when they again
 fall outward and as the cage descends en-
 35 gage the lowest door and hold all the doors
 as shown in Fig. 1.

It will be noted that by my device the
 elevator cage may be started upward, re-
 ceive the doors and caused to descend and
 deposit them at each floor, all without the
 40 operator accompanying the cage. This may
 be done by operating the elevator hoist
 mechanism from the lowest floor, and is
 invaluable in case of a fire having filled the
 building with smoke so that persons can-
 45 not go to or in the elevator shaft and handle
 doors on each floor. By reason of the trip-
 pers 20 lying horizontally and out of aline-
 ment with the catches 7, when not in use,
 the elevator may be operated continuously
 50 without releasing the doors until it is de-
 sired.

My device provides a most simple and
 automatic mechanism as thus shown, oper-
 ated by one movement of the lever handle
 55 27 placed in an entirely convenient position
 for the operator.

Having thus fully described my inven-
 tion I claim—

1. The combination with an elevator shaft,
 60 a cage, and vertical hatch supports arranged
 upon the upper side of its roof, of a hatch
 cover adapted to be carried by the supports
 16 and angled cover catches 7 pivoted at
 their lower ends upon the sides and near the
 65 upper end of the shaft, said catches having

gravity contact arms 9 pivoted at their lower
 ends on the catch pivots, their upper ends
 being free, and recoil springs placed to out-
 wardly retain the upper catch ends the
 catches being formed and arranged to en- 70
 gage the cover when it is above them and
 to move backward without its vertical line
 of descent, substantially as described.

2. The combination with an elevator shaft
 and cage, of a hatch cover adapted to be car- 75
 ried by the cage, pivoted gravity cover
 catches upon the sides and near the upper
 end of the shaft, stands secured on the cage
 roof, horizontal shafts D which are rotatable
 in said stands, catch releasing mechanism 80
 comprising vertical cover supports 16, hav-
 ing counterweights at their lower ends rig-
 idly secured to said shafts, vertically mov-
 able plunger pins 17 within the supports, ex-
 tending above them, beveled on their lower 85
 ends, and holding springs 18 for said plun-
 ger pins, angled tripper arms 20 rotatably
 mounted on said shafts D near their outer
 ends and alongside the supports, said arms
 having counterweights 23 on their lower 90
 parts adapted to draw the arms to hori-
 zontal position by gravity action and shoul-
 ders 21 on their lower ends, their upper ends
 being formed and arranged to engage the 95
 cover catches when the arms are vertically
 placed, laterally movable horizontal pins 24
 placed within the shafts D, the inner ends
 thereof being beveled and in position to en-
 gage the lower ends of the plungers 17 when
 depressed, the outer ends provided with keys 100
 24' in position to engage the shoulder of the
 trippers when the pins are in inward posi-
 tion, and release the trippers when the pins
 are in outward position to the gravity action
 of their counterweights, springs to retain 105
 said pins inwardly, and also means secured
 upon the cage to rotate the shafts D until
 the keys 24' engage the trippers 20 and per-
 mit their elevation to vertical position in
 alinement with the catches by the gravity 110
 action of the weights on the supports 16,
 substantially as described.

3. In an elevator of the kind described
 having hatch covers, hatch catches, stands se- 115
 cured on the cage roof and horizontal shafts
 D which are rotatable in said stands, a catch
 releasing mechanism comprising vertical
 cover supports 16, having counterweights at
 their lower ends, rigidly secured to said
 shafts, vertically movable plunger pins 17 120
 within the supports, extending above them,
 beveled on their lower ends and holding
 springs 18 for said plunger pins, angled
 tripper arms 20 rotatably mounted on said
 shafts D near their outer ends and alongside 125
 the supports, said arms having counter-
 weights 23 on their lower parts adapted to
 draw the arms to horizontal position by
 gravity action and shoulders 21 on their
 lower ends, their upper ends being formed 130

and arranged to engage the cover catches when the arms are vertically placed, laterally movable horizontal pins 24 placed within the shafts D, the inner ends thereof being
5 beveled and in position to engage the lower ends of the plungers 17 when depressed, the outer ends provided with keys 24' in position to engage the shoulder of the trippers when the pins are in inward position, and
10 release the trippers when the pins are in outward position to the gravity action of their counterweights, springs to retain said

pins inwardly, and also means secured upon the cage to rotate the shafts D until the keys 24' engage the trippers 20 and permit
15 their elevation to vertical position in alignment with the catches by the gravity action of the weights on the supports 20, all substantially as described.

EDMUND O. VANDEMAR.

Witnesses:

F. C. SELLWOOD,
C. H. MOORE.