

Feb. 14, 1933.

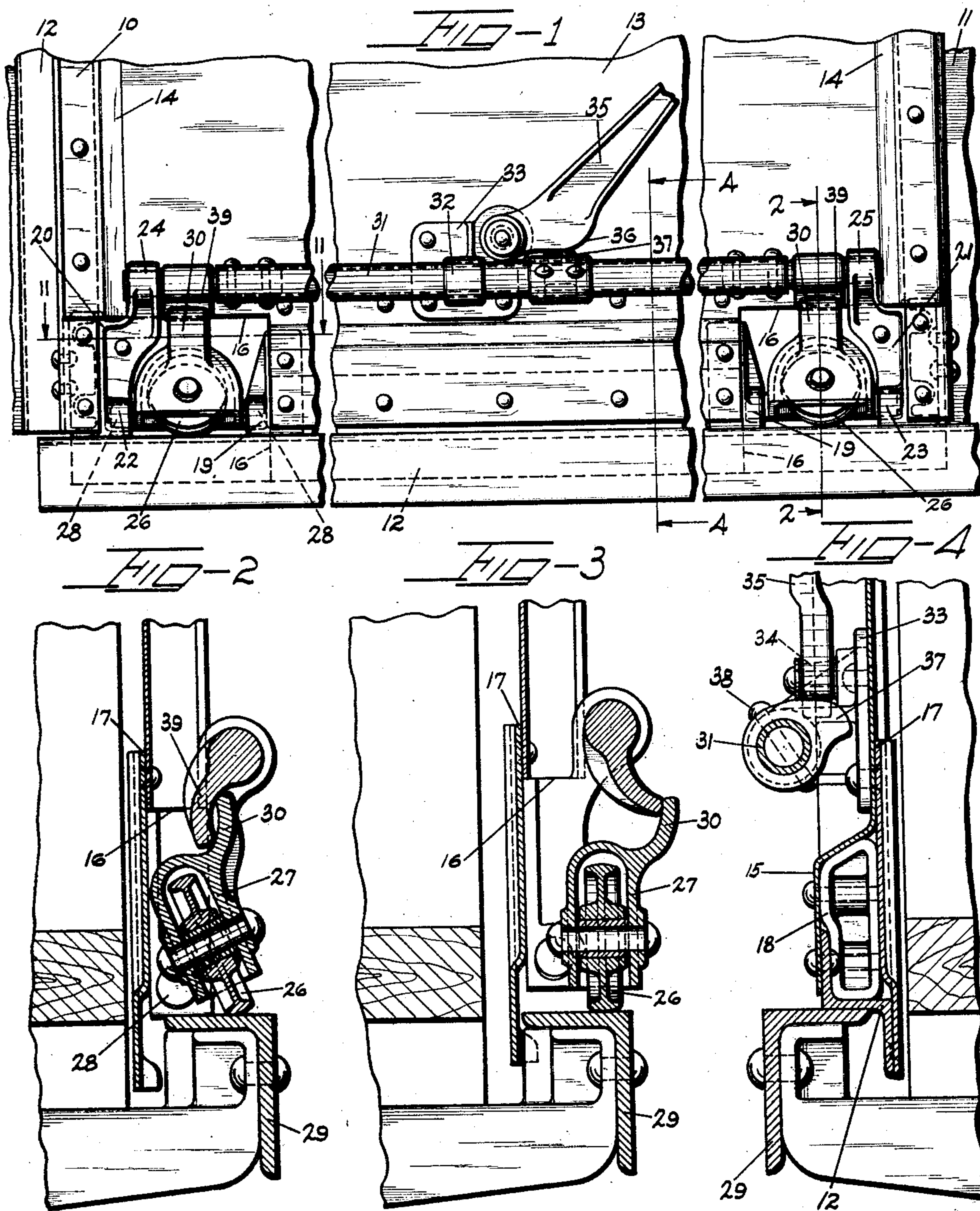
A. WASBERG

1,897,563

DOOR ELEVATING CONSTRUCTION

Filed April 29, 1931

3 Sheets-Sheet 1



INVENTOR~
AXEL WASBERG

By-

Samuel Reese

ATTY.

Feb. 14, 1933.

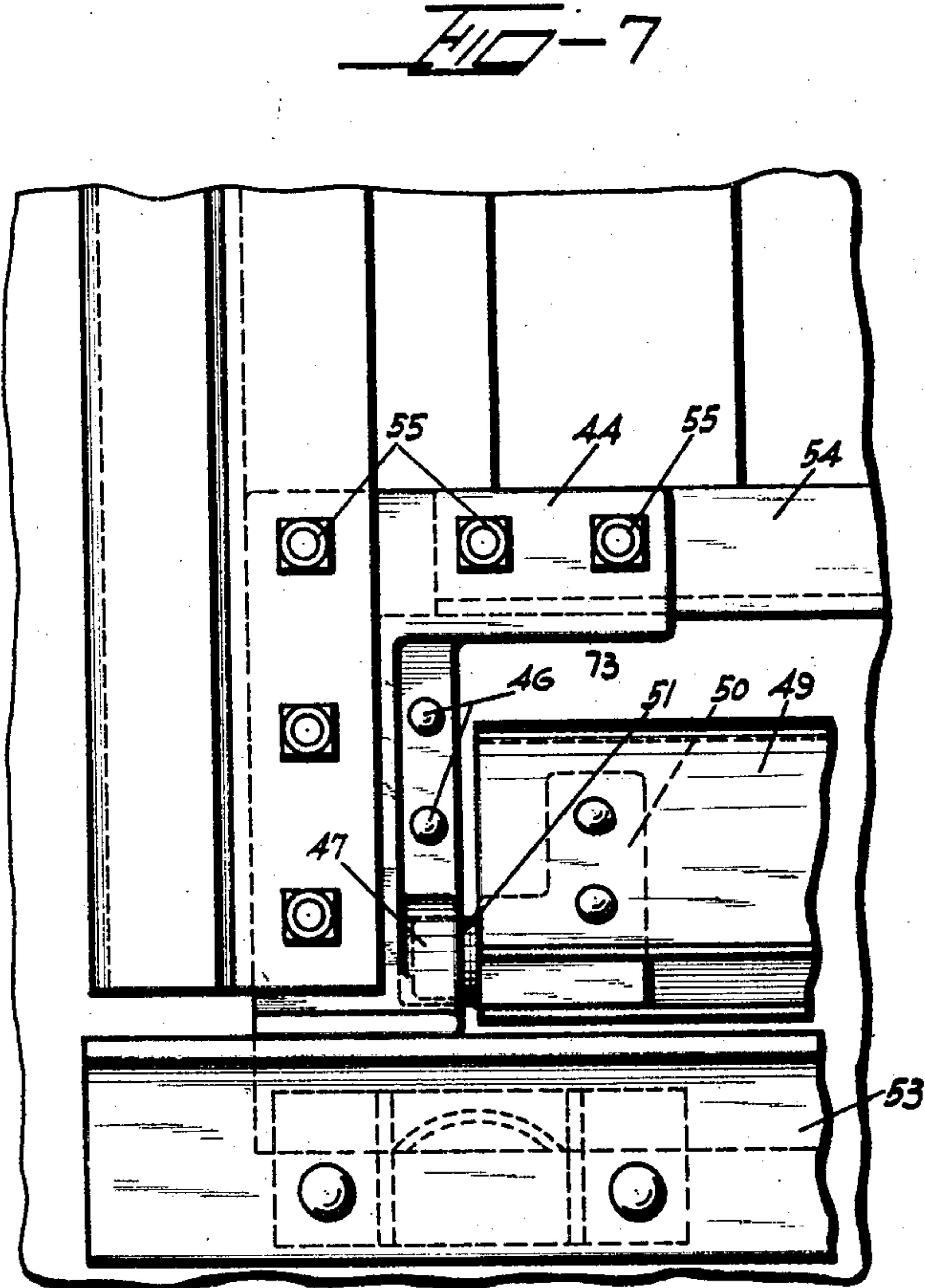
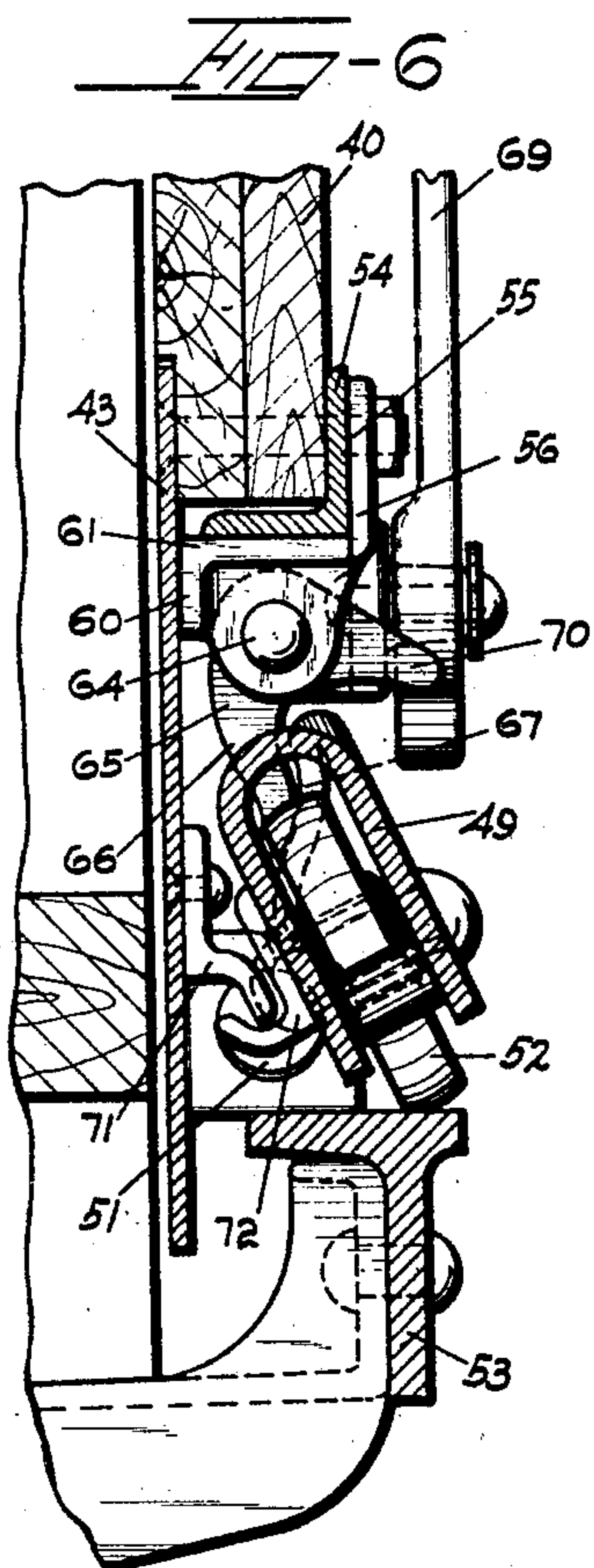
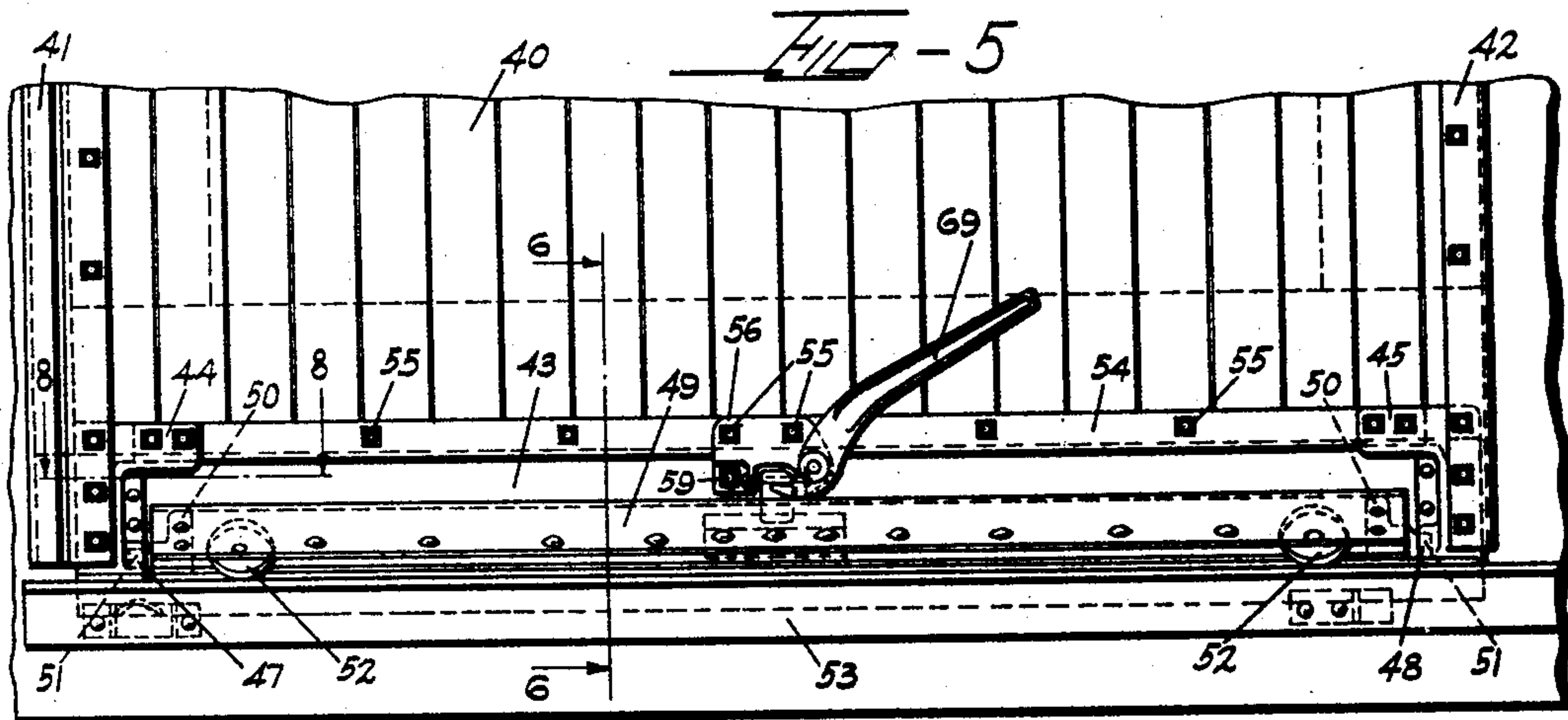
A. WASBERG

1,897,563

DOOR ELEVATING CONSTRUCTION

Filed April 29, 1931

3 Sheets-Sheet 2



~INVENTOR~
AXEL WASBERG

By~ Samuel Reese

ATTY.

Feb. 14, 1933.

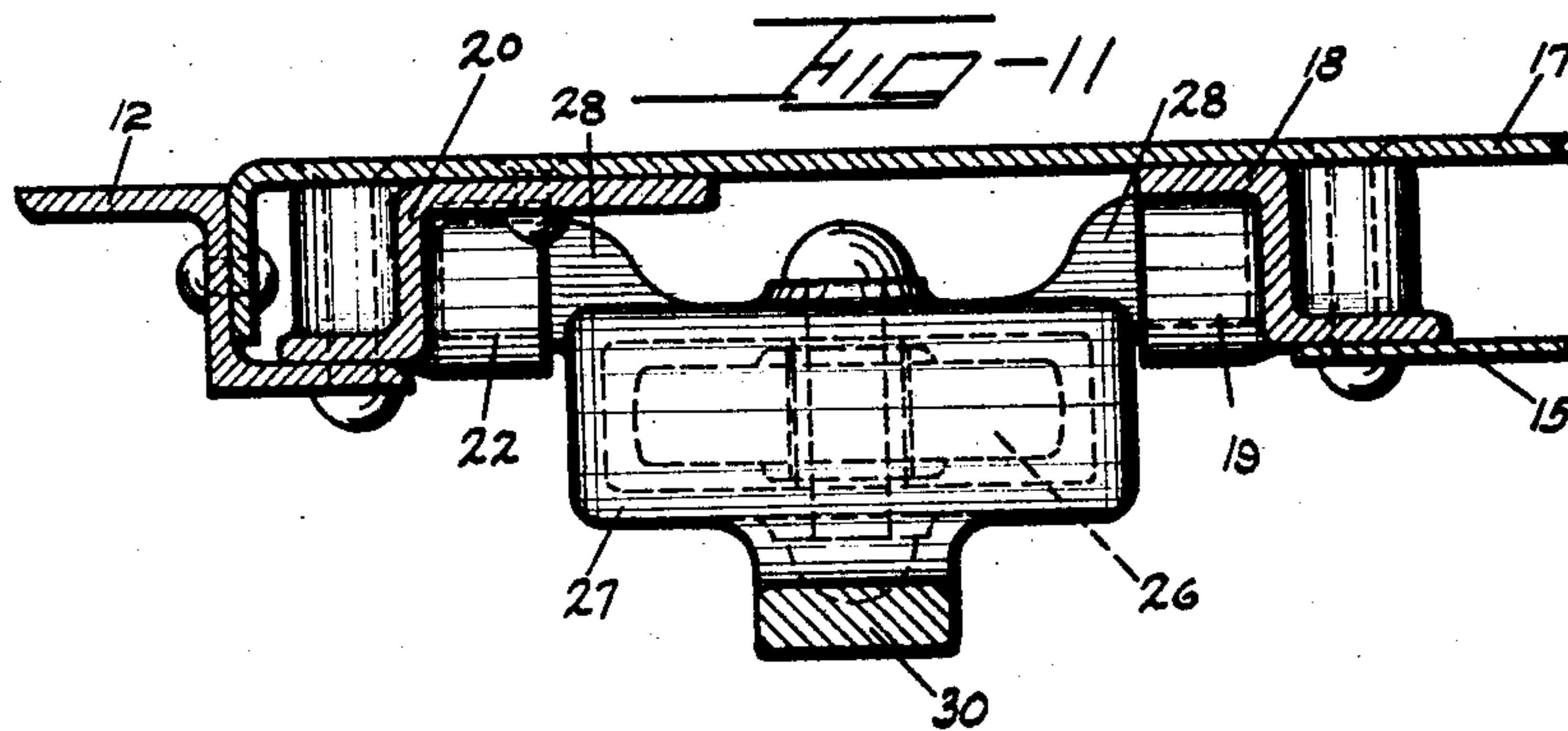
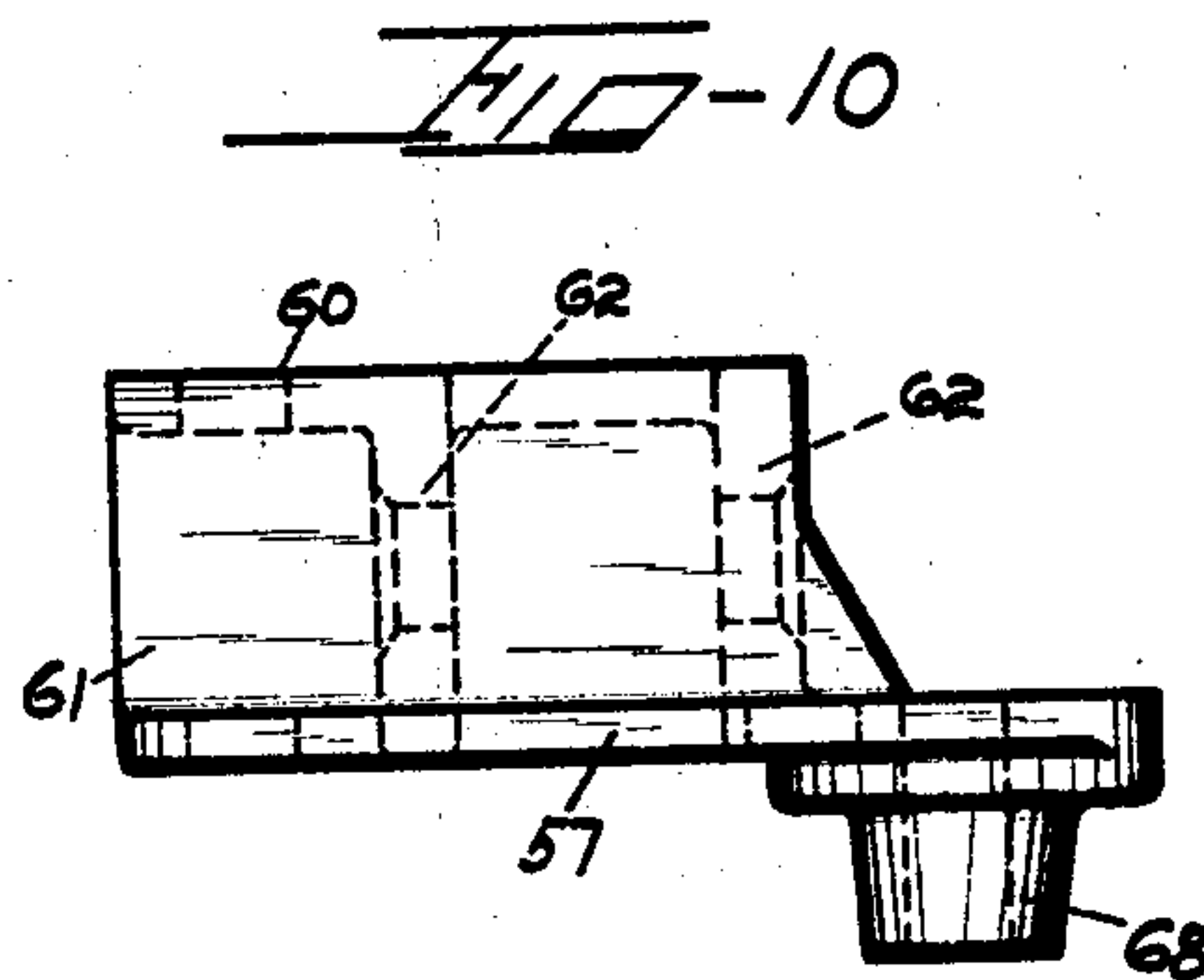
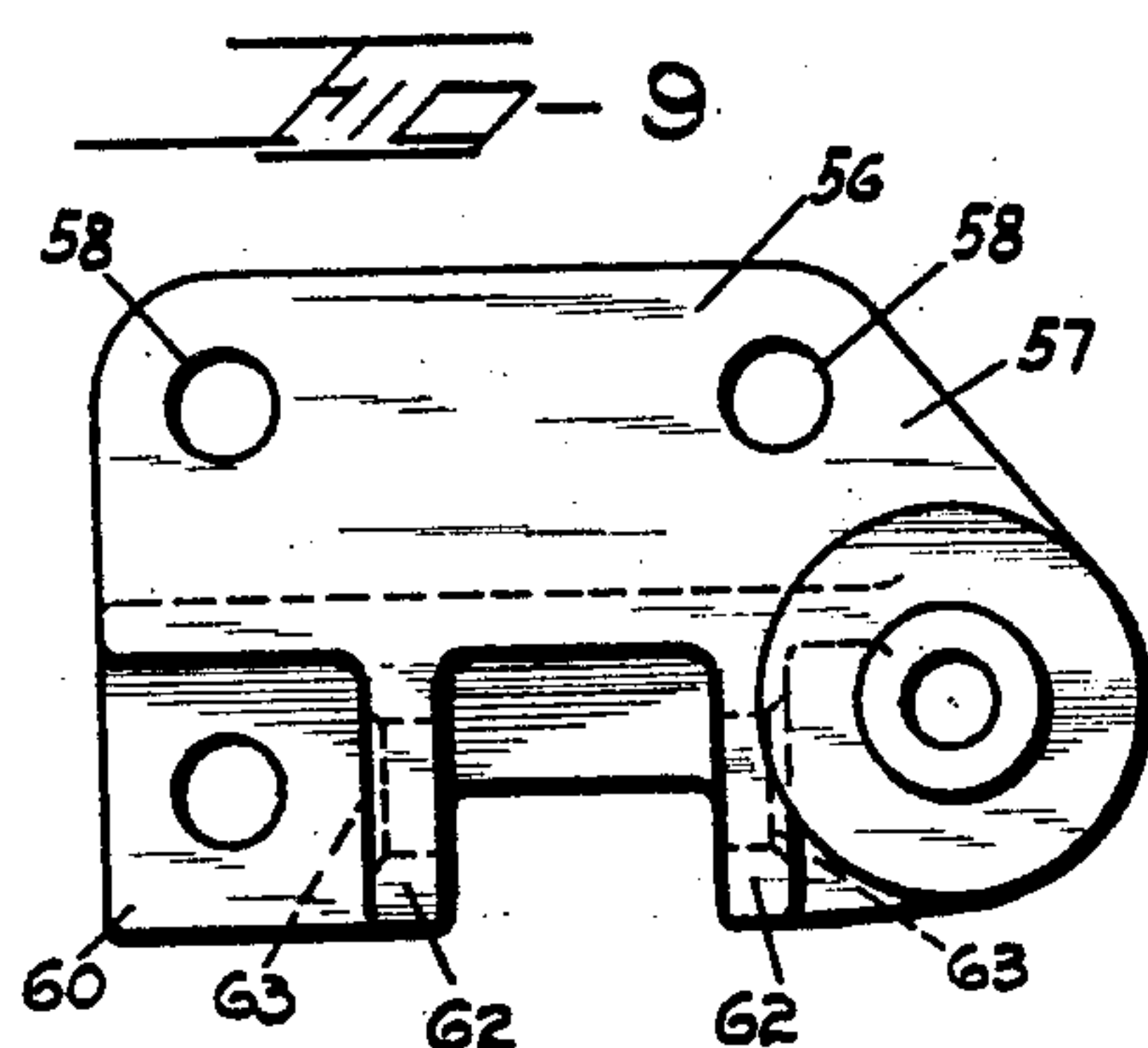
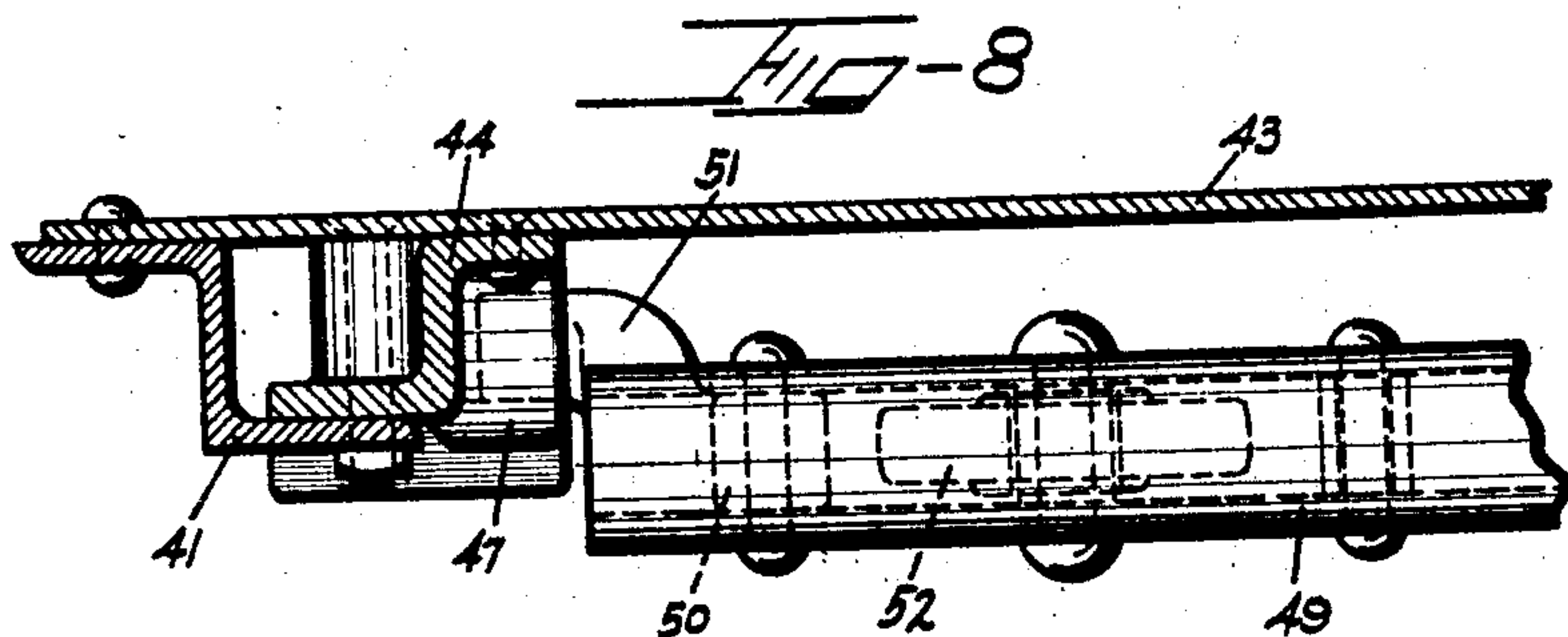
A. WASBERG

1,897,563

DOOR ELEVATING CONSTRUCTION

Filed April 29, 1931

3 Sheets-Sheet 3



~INVENTOR~

AXEL WASBERG

By~

Samuel Reese

ATTY.

UNITED STATES PATENT OFFICE

AXEL WASBERG, OF CHICAGO, ILLINOIS, ASSIGNOR TO CAMEL COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

DOOR ELEVATING CONSTRUCTION

Application filed April 29, 1931. Serial No. 533,639.

This invention relates to door elevating constructions and comprehends more particularly such constructions which embody inclined rollers.

5 Among the objects of this invention may be mentioned the provision of simple and inexpensive lift constructions capable of easy repair while the said constructions are in position upon a door, without removing the
10 door from the car.

The objects embrace, further, door elevating constructions capable of assembly into a unit applicable as such to a door.

15 The invention comprises the novel constructions and combinations hereinafter described and more particularly pointed out and defined in the appended claims.

In the accompanying drawings

20 Figure 1 is a fragmentary elevation of a car having a door to which one form of the invention is applied.

Figure 2 is a sectional view taken on line 2—2 of Figure 1, the door being shown in lowered position.

25 Figure 3 is a view similar to Figure 2, the door being shown in elevated position.

Figure 4 is a sectional view taken on line 4—4 of Figure 1.

30 Figure 5 is a view similar to Figure 1, illustrating another form of the invention applied to a wood door.

Figure 6 is a sectional view taken on line 6—6 of Figure 5.

35 Figure 7 is an enlarged partial elevation of the lower left hand corner of the door shown in Figure 5.

Figure 8 is a sectional view taken on line 8—8 of Figure 5.

40 Figure 9 is an elevational detail of a bracket upon which operating and bell crank levers are supported.

Figure 10 is a top plan view of the bracket shown in Figure 9.

45 Figure 11 is a sectional view taken on line 11—11 of Figure 1.

Referring to the form of the invention illustrated in Figures 1 to 4, inclusive, and Figure 11, it is observed that this form of
50 the invention is shown for purposes of illus-

tration merely in its application to a metallic door 10 mounted upon the car, generally indicated by the numeral 11. The door 10 is characterized by marginal framing members, two of which are indicated at 12 55 and represented to be a Z-bar. The door 10 may comprise a dished panel or a number of dished panels 13, these panels being provided with upwardly offset portions 14—14 and a lower offset portion 15. It is noted that the
60 lower offset portion 15 of the panel overlaps the lower Z-bar framing member 12 and is riveted thereto (see Figure 4 of the drawings). Adjacent the lower corners of the door 10 the marginal framing member 12 as 65 well as the offset portion 15 of the panel 13 is coped out as indicated at 16. Extending substantially the width of the door and riveted thereto is a backing plate 17, this back-
70 ing plate extending across the coped portions of the panel and the framing member and providing relatively flat spots on the door for the purpose hereinafter set forth.

In each end of the remaining marginal framing member 12 and the outwardly offset portion 15 of the panel, there is inserted the bracket member 18 riveted to the backing plate 17, as well as to the framing member 12 and the offset portion 15 of the panel. 75 Each of these bracket members 18 is provided with a bearing 19 extending beyond said ends as clearly shown in Figure 11 of the drawings. Secured to the vertical marginal framing 12 at the forward or left hand margin of the door is a bracket member 20 and 80 secured to the vertical marginal framing member at the rear or right hand margin of the door is a bracket member 21. The bracket member 20 is provided with a bearing 22, extending toward the bearing 19 formed on the adjacent bracket member 18 and being in alignment therewith. The bracket member 21 is also provided with a bearing 23 extend- 85 ing toward and aligned with the bearing member 19 formed on the adjacent bracket 18. The bracket members 20 and 21 are provided additionally with upwardly extending bearings 24 and 25 for a purpose hereinafter described. 90

A roller 26 is adapted to be positioned ad- 100

5 jacent the door in each of the flat spots there-
of provided by coping of the outwardly off-
set portion 15 of said door and of the mar-
ginal framing member 12 at the lower mar-
gin thereof. These rollers 26 are preferably
rotatably supported in retainers 27 which
in turn are provided preferably integrally
therewith with oppositely extending eccen-
trically positioned trunnions 28—28 adapted
10 to be seated in the aligned bearings 19 and
22 and 19 and 23, respectively. These roller
retainers in the normal or lowered position
of the door assume a position inclined rela-
tive thereto and maintain the rollers 26 at all
15 times in engagement with a supporting track
29. An upwardly extending lug 30 is formed
on each of the roller retainers 27.

An operating bar 31 is journaled in the
bearings 24 and 25 formed respectively on
20 the brackets 20 and 21. The operating bar
31 is additionally journaled in a bearing
member 32 formed on a bracket 33 secured
substantially centrally to the door. The
bracket member 33 is provided additionally
25 with an outwardly extending boss 34 upon
which is pivotally mounted an operating
lever 35. This operating lever embodies a
cam portion 36 adapted to bear upon the cam
37 collared upon the operating bar 31 and
30 rigidly secured thereto by means of rivets 38.
The operating bar 31 is formed with a plu-
rality of downwardly extending cams 39—39
positioned between the door 10 and the up-
wardly extending lugs 30 provided on the
35 roller retainers 27 and in engagement with
the latter. It is observed that the cam 37
provided on the operating bar 31 as well as
the operating lever 35 extend between the
door and said operating bar.

40 In Figures 5 to 10, inclusive, an embodi-
ment of this invention is illustrated in its
application to a wood car door. In this in-
stance this form of the invention constitutes
a unit which may be applied as such to the
45 door. The door, indicated generally by the
numeral 40, is provided with marginal fram-
ing members 41—42, these framing members,
as clearly indicated in Figure 5 of the draw-
ings, extending downwardly below the wood
50 portion of the door. The elevating unit com-
prises a backing plate 43 to the ends of which
are secured the brackets 44 and 45 by means
of the rivets 46. Each of the brackets 44
and 45 is provided with a bearing member
55 47 and 48, respectively. These bearing mem-
bers extend toward each other and are in
alignment. A roller retainer 49, preferably
of inverted U shaped transverse section, is
provided at its ends with substantially L
60 shaped bracket members 50. These bracket
members present outwardly extending
aligned trunnions 51 in eccentric relationship
with the roller retainer 49 and journaled in
the bearings 47 and 48 formed on the brack-
65 ets 44 and 45. Rotatably supported in the

roller retainer 49 is a plurality of spaced
rollers 52 maintained in rolling engagement
with a supporting track 53. As in the first
embodiment of the invention the roller re-
tainer 49 in the normal or lowered position 70
of the door is inclined relative thereto.

A reinforcing angle member 54 is provided
at the lower margin of the wood portion of
the door 40. This angle member is secured
to said portion of the door by means of a 75
plurality of bolts 55 extending through said
angle member, said portion of the door and
the backing plate 43. Certain of these bolts,
additionally, extend through the brackets 44
and 45 as well as through the angle member 80
54, the wood portion of the door 40 and the
backing plate 43. Others of the bolts 55
are utilized to secure to the door a substan-
tially centrally positioned bracket 56.

The bracket member 56 comprises a verti- 85
cally extending flange 57 adapted to overlap
a corresponding flange on the reinforcing
angle member 54 and to be secured thereto by
means of the bolts 55 extending through the
openings 58 provided in said flange. The 90
bracket member 56 is adapted to be secured
to the backing plate 43 by means of a bolt 59
extending through a depending flange 60
offset from the flange 57 and positioned in
abutting relationship with the backing plate 95
43. A horizontal flange 61, connecting the
vertical offset flanges 57 and 60, is adapted
to be positioned in abutting relationship with
the corresponding flange on the reinforcing
angle 54. In the angle formed by the flanges 100
60 and 61 of the bracket member 56 a pair of
spaced walls 62—62 is provided. These walls
are formed with aligned openings 63—63
through which a pin 64 is adapted to extend.
Upon this pin is pivotally mounted a bell 105
crank lever 65, one arm 66 of which is adapt-
ed to be positioned in engagement with a
deformed portion 67 provided on the roller
retainer 49. Extending from the flange 57
of the bracket 56 is a boss 68 upon which an 110
operating lever 69 is adapted to be pivotally
mounted intermediate the ends thereof. One
end of said lever 69 extends under the other
arm 70 of the bell crank lever 65 in engage-
ment therewith. The door is provided sub- 115
stantially centrally thereof with a deformed
angle member 71 adapted to have interlocking
engagement with a second deformed angle
member 72 for the reason hereinafter indi-
cated. 120

When it is desired to elevate the door shown
in Figures 1 to 4, inclusive, and 11 from its
normal or lowered position in engagement
with the track 29 as indicated in Figures 2
and 4 of the drawings a downward pull is 125
exerted upon the operating lever 35. This
downward pull, as a result of the engage-
ment between the cam portions 36 and 37
provided on the lever and on the operating
bar 31, respectively, will produce rotation of 130

said operating bar in the bearings 24 and 25. As the operating bar rotates the cam portions 39 provided on said bar in engagement with the lugs 30 formed on the roller retainers 27 will be forced to swing outwardly, causing a corresponding outward movement of said lugs. During this movement the roller retainers 27 will be moved from a position inclined relative to the door to a substantially vertical position and in view of the eccentric pivotal engagement established between the trunnions 28—28 formed on said roller retainers and the bearings 19 and 22 and 19 and 23, respectively, on the brackets 18 and 20 and 21, an upward or elevating movement of the door will be effected. The door may then be quite readily moved toward open or closed position.

It is apparent, with the construction shown, that the roller retainers as well as the rollers may readily be removed if necessary. Removal of the rivets securing the brackets 18 to the door permits sliding of said brackets into the outwardly offset portions 15 so that the engagement between the journals 28 and the bearings formed in said bracket 18 is broken. The roller retainers may then readily be removed. It is also clear that the brackets 20 and 21 may easily be removed. It is further apparent that the lifting mechanism may be utilized with any type of metallic door. It is only desirable that flat portions be provided on said door so that the roller retainers may be easily mounted relative thereto. It is further clear that if desirable the lift mechanism utilized with a steel door may be formed as a unit prior to its application thereto.

In the form of the invention illustrated in Figures 5 to 10, inclusive, it is evident that the roller retainer 49, the end brackets 44 and 45 and the center bracket 56 may all be mounted upon the backing plate 43 and then, as a unit with said backing plate, be applied to the door. In this embodiment of the invention it is also clear that repairs may readily be made without removal of the door from the car upon which it is mounted. The roller retainer 49 may be removed by removing the rivets connecting one bracket 50 and sliding such bracket inwardly in order to withdraw the trunnion formed on said bracket from the bearing provided in the adjacent bracket. In the operation of the door shown in this embodiment of the invention, a downward pull upon the free end of the lever 69 will result in an upward movement of the opposite end thereof. This movement will impart a corresponding upward movement to the arm 70 of the bell crank lever 65. The arm 66 during this movement will exert an outward thrust upon the roller retainer 49, whereby said retainer will be rocked from its inclined position shown in Figure 6 of the drawings to a substantially vertical

position. During this movement the door will be elevated and will be moved outwardly from its opening at the same time. In order to prevent bulging of the roller retainer which, in this form of the invention may readily be made of a pressing, the inter-engaging angles 71 and 72 are provided. Attention is further invited in this form of the invention to the angular construction of the brackets 50 secured in the roller retainer. It is observed that the upwardly extending portion of said brackets constitute, together with the ends of the roller retainer pockets 73 into which a crowbar may be inserted for rocking the roller retainer and elevating the door in the event that the usual operating lever 69 is rendered inoperative.

It is to be understood that the invention is not limited to the details of construction illustrated. All changes and modifications of such details falling within the scope of the claims appended hereto are intended to be comprehended within the invention.

I claim:

1. In door elevating construction, in combination, a plurality of inclined rollers, means for retaining said rollers in rolling engagement with a track, cam means mounted upon said door for transverse rotation relative thereto, said cam means having engagement with said roller retaining means and a lever for imparting movement to said cam means for the purpose set forth.

2. In door elevating construction, in combination, a plurality of inclined rollers, means for retaining said rollers in rolling engagement with a track, said means being pivoted eccentrically to said door, cam means mounted upon said door for transverse rotation relative thereto, said cam means having engagement with said roller retaining means and a lever for imparting movement to said cam means for the purpose set forth.

3. Door elevating construction comprising, in combination, a plurality of rollers normally inclined relative to the door, retainers supporting said rollers in rolling engagement with a track, an operating bar rotatably journaled on said door, cam means secured to said bar in engagement with said roller retainers and means for rotating said bar for the purpose set forth.

4. Door elevating construction comprising, in combination, a plurality of rollers normally inclined relative to the door, retainers supporting said rollers in rolling engagement with a track, said retainers having eccentric pivotal engagement with said door, an operating bar rotatably journaled on said door, cam means secured to said bar in engagement with said roller retainers and means for rotating said bar for the purpose set forth.

5. Door elevating construction comprising, in combination, a roller retainer pivoted ec-

centrically adjacent each lower corner of the door, a lug extending from each retainer, a roller rotatably supported in each retainer in engagement with a track, said retainers
5 and rollers being inclined in the normal position of the door, and means embodying transversely rotatable cams engageable with said lugs for positioning said retainers and rollers substantially vertically to elevate said
10 door.

6. Door elevating construction comprising, in combination, a plurality of rollers inclined relative to said door in the lowered position of the latter, means eccentrically
15 connecting said rollers to said door, said means including lugs, a bar rotatably supported on said door provided with cams engaging said lugs, a collar fixed to said bar, a cam portion extending from said collar
20 toward said door and a lever pivoted on said door and engageable with said cam portion for the purpose set forth.

Signed at Chicago, Illinois, this 27th day of April, 1931.

25

AXEL WASBERG.

30

35

40

45

50

55

60

65