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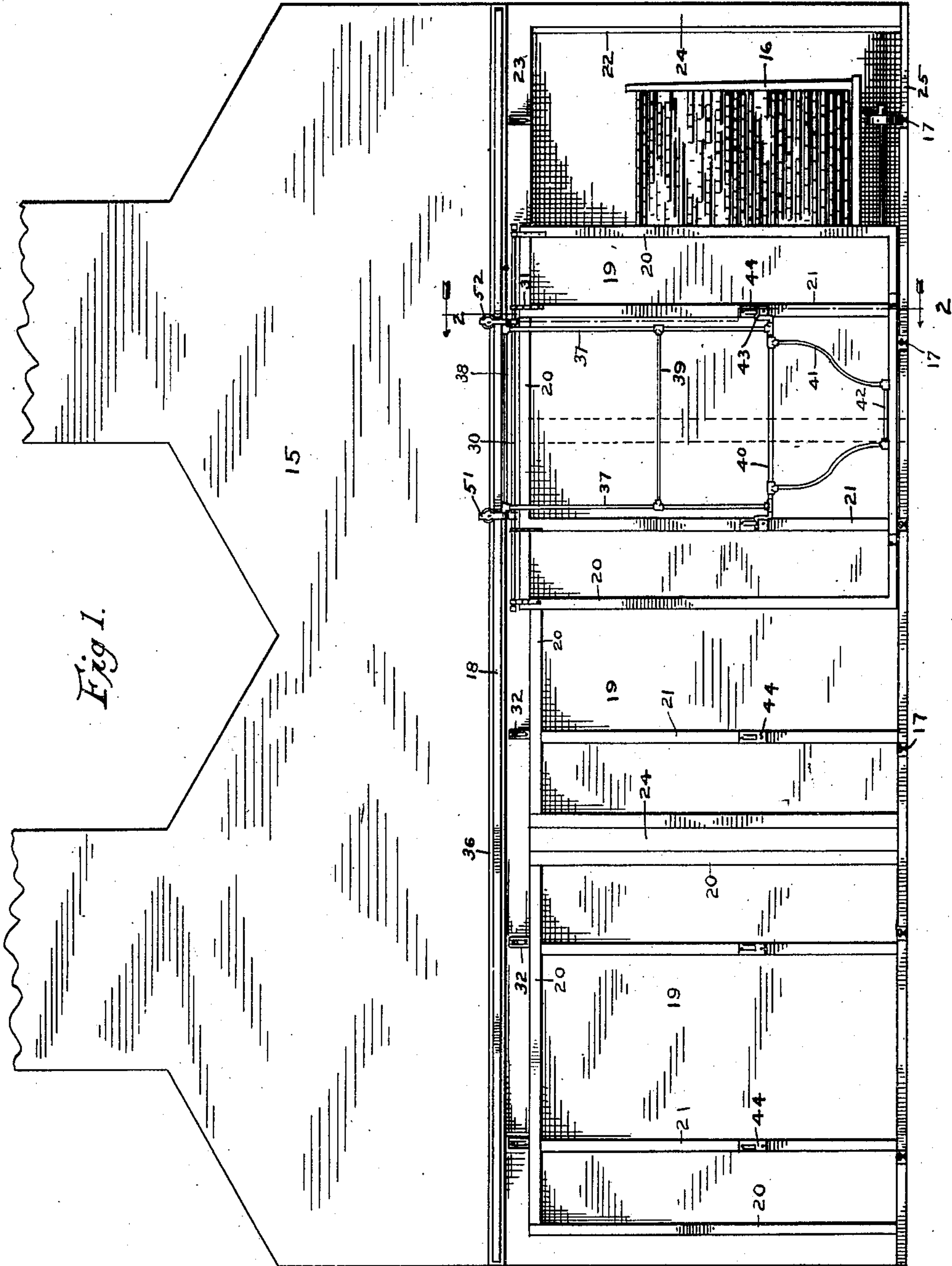
PATENTED MAR. 1, 1904.

J. R. HUSSEY.
REMOVABLE DOOR.

APPLICATION FILED APR. 22, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



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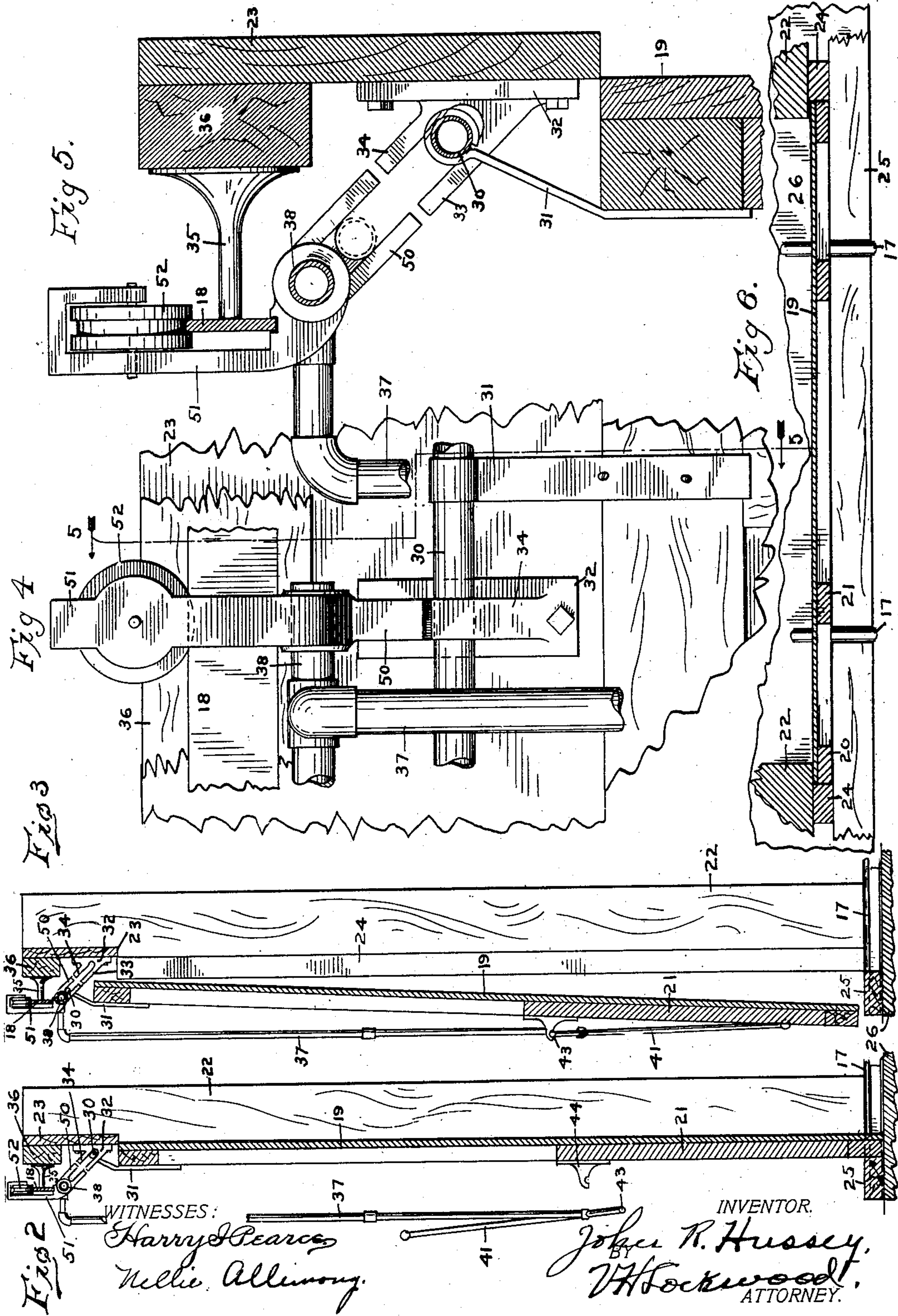
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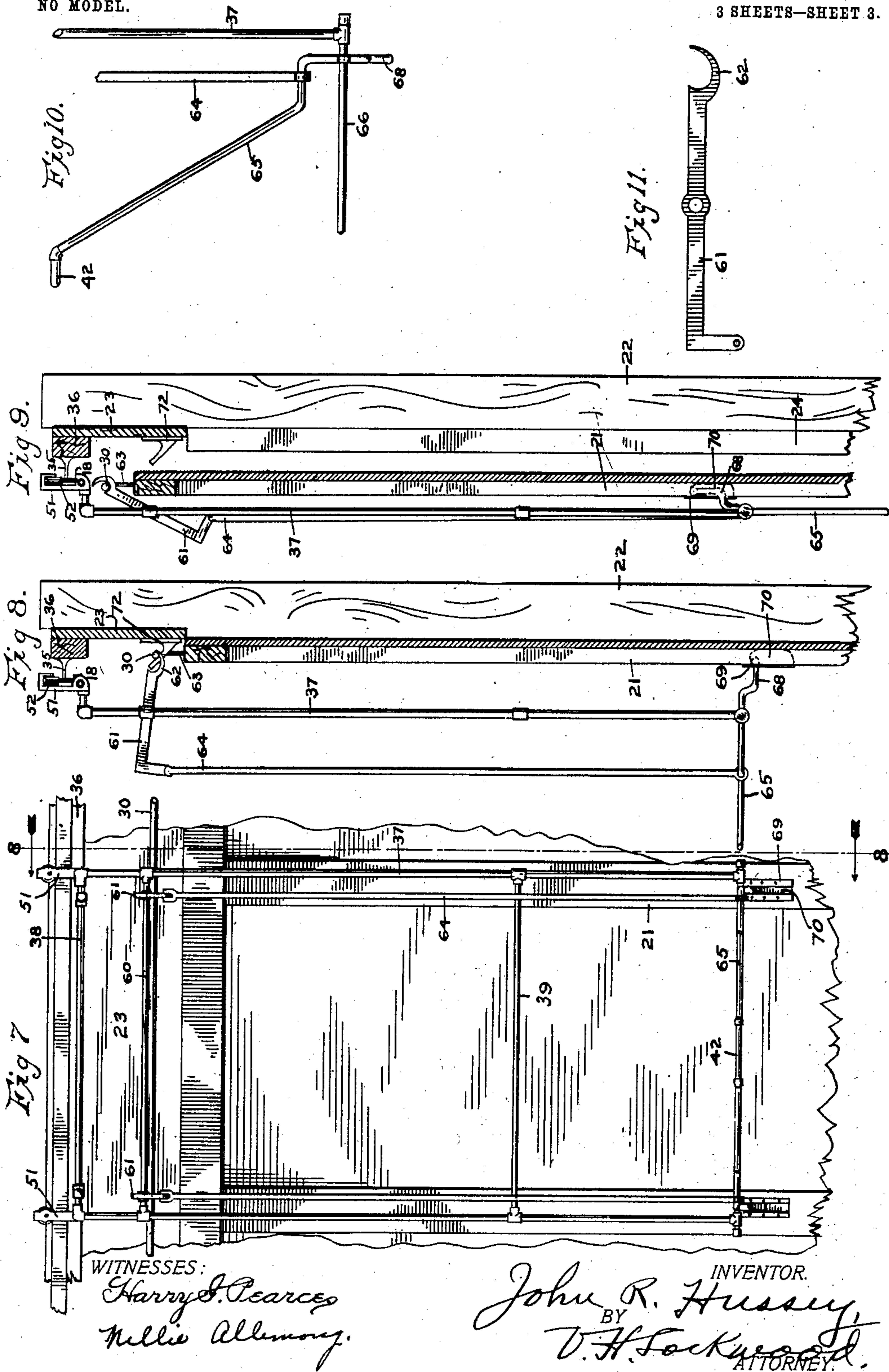
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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

JOHN R. HUSSEY, OF INDIANAPOLIS, INDIANA.

REMOVABLE DOOR.

SPECIFICATION forming part of Letters Patent No. 753,578, dated March 1, 1904.

Application filed April 22, 1903. Serial No. 153,757. (No model.)

To all whom it may concern:

Be it known that I, JOHN R. HUSSEY, of Indianapolis, county of Marion, and State of Indiana, have invented a certain new and useful Removable Door; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like numerals refer to like parts.

The object of this invention is to provide an efficient and practical means for removing and replacing a door or doors for buildings or structures of any kind. The door or doors are removable; and one feature of the invention consists in the idea of a holding means independent of the door for removing and replacing the same.

Another feature of the invention consists in providing a single means for removing and replacing any one of a plurality of doors. This is useful where, as in dry-kilns and the like, there is a plurality of doors side by side.

My invention contemplates providing a single frame movable on a track whereby any one of said doors can be picked up and transported laterally without interfering with any other doors and then replaced.

Another feature of the invention consists in means for hanging the door on a building in the closing position, so that its weight will cause it to fit in against the building snugly.

A novel feature also consists in picking up a removable door by engagement with its upper end and transporting it and also by picking up the door below the upper end and having means at the upper end for holding the door while it is being transported.

Another feature of the invention consists in providing means for laterally moving a rabbeted door. The door is removable and fits in rabbets along the sides and the bottom. A track is secured to the building above the door and means is provided that is movable on said track laterally for removing the door from its rabbeted position against the building and moving it sidewise on the track and replacing the door in its rabbeted position. The means for removing and replacing the door lifts the door and moves it outward away from the building and upward simultaneously to take

it out of its rabbeted position clear of the building, and in replacing the door said means forces the door inward and downward simultaneously into its rabbeted position.

The full nature of this invention will be understood from the accompanying drawings and the following description and claims.

In the drawings, Figure 1 is a front elevation of a lumber dry-kiln with portions broken away, said dry-kiln having three doors and one track above them and one means for moving said doors, one door being shown moved partially to one side. Fig. 2 is a vertical section on the crooked line 2 2 of Fig. 1, showing the door closed. Fig. 3 is the same, showing the door open and detached from the front wall of the kiln and ready to be moved laterally. Fig. 4 is a front elevation of a portion of the front wall of the kiln, the track, the door, and the means for suspending and moving the door on the track, parts being broken away, the figure being on an enlarged scale. Fig. 5 is a vertical section on the line 5 5 of Fig. 4. Fig. 6 is a horizontal section of the doorway of the kiln above the bottom, the same being broken away at the sides to show rabbets into which the edges of the door along the bottom and sides fit. Fig. 7 is an elevation of a portion of the front of the dry-kiln and the door and a modified construction for detaching and moving the door, parts being broken away. Fig. 8 is a vertical section of what is shown in Fig. 7 on the line 8 8, showing the parts in position ready to move the door. Fig. 9 is the same as Fig. 8, with the parts operated so as to remove the door. Fig. 10 is a front elevation of a portion of the lever and door supporting mechanism as shown in Fig. 7, the lever being in its elevated position and parts being broken away. Fig. 11 is a side elevation of a lever shown in the modified form.

While there is shown herein a lumber dry-kiln for the purpose of illustrating the general nature of my invention, I do not wish to limit its use to a lumber dry-kiln or necessarily to a similar construction, as it can be used in many other places.

In detail 15 is the front of a dry-kiln, having three doorways or entrances for cars 16.

loaded with lumber to pass through on the track-rails 17. There is a sliding-door track 18 secured to the front of the building over said entrances and three doors 19, one for each entrance. These doors are independent of each other and of the building, of the track, and of the means of conveying them. A single means running on the track and suspended therefrom is used to pick up any desired door and detach it from the building—that is, remove it from its closing position and move it laterally out of the way without interfering with the other doors. While the door is being moved it is suspended on the track by the suspending and moving mechanism. While it is closed it is not suspended from the track. These doors, as shown, are made with a reinforcing timber or strip 20 around the edges, and there are intermediate vertical reinforcing timbers or strips 21, although I do not wish to limit the doors to any particular construction. The door-casings are formed of the side pieces 22 and the cross-piece 23 at the top, with the timbers 24 secured to the front faces of the side pieces 22 and set laterally somewhat, as shown in Fig. 6, to form a rabbet along each side, into which the door can snugly fit. Across the bottom there is a timber 25, secured against the lower ends of the timbers 24 to form also a rabbet at the bottom, into which the door drops, so that said door as it moves into its closing position inward moves at the same time downward and fits snugly in against the building, so as to make a tight closure, a thing desirable especially in dry-kilns. This cross-timber 25 at the bottom is cut intermediate its ends to let the track-rails 17 pass through. There is a sill 26 below the parts 22, 24, and 25, as seen in Fig. 6.

Since doors in dry-kilns and like large structures are large and very heavy and it is desirable that they fit very snugly in the rabbets to make a tight closure, the closing and opening of said doors is usually accompanied with difficulties, and to overcome these difficulties is the object of this invention.

The doors have connected to them at the top a transverse rod 30 by means of strips or connections 31, so that the transverse rods of each door will enter or ride into or upon brackets 32, secured stationary to the front of the building to the cross-timber 23, as shown. These brackets have arms 33 extending outward and upward at an inclination of about forty-five degrees, that engage and support the rod 30 and the door when in its closing position. The brackets have an upper arm 34, that acts as a guide for the rod 30 while the door is being removed or replaced. As the door is put in place gravity draws the door downward, while the inclined lower arm of the bracket 32 draws the upper part of the door inward and holds it snugly against the building, the construction of the bracket 32

being such that the rod 30 from the door will not reach the bottom of the slot, but will rest on the inclined surface of the lower arm 33, whereby the weight of the door insures a very tight fit, and the heavier the door the tighter the fit will be.

The track 18 consists of a bar of metal secured to a number of arms 35, extending outward from the cross-timber 36, secured to the front of the building. The track is set out from the building far enough to cause a moving door to clear the other doors. The doors are not hung on said track or connected therewith; but a door removing and transferring means is mounted on the track, so as to be moved longitudinally thereon and to pick up and move a door. In the form shown in the first five figures this door-removing means consists of a gas-pipe formed into a rectangular frame, it having side bars 37, that are turned inward at their upper ends and mounted loosely on the upper transverse bar 38. A brace-bar 39 is rigidly secured to the vertical bars 37 about midway between their ends. A crank-shaft 40 is rotatably mounted in the lower ends of the vertical bars 37. A lever formed of the two side bars 41, with a handle 42 at the end, is secured rigidly to the crank-shaft 40, preferably on each side near its bearings. Outside the bearings said shaft 40 has at each end a crank 43 with a longitudinally-extending end that is adapted to engage catches 44, secured to the door, preferably to the vertical timbers 21 of the door. These catches 44 have a notch on the under side adapted to receive the ends of the cranks 43. When the lever is in its elevated position, as shown in Fig. 2, the cranks 43 are out of engagement with the catches 44 on the door; but when said lever is turned downward by hand from the position shown in Fig. 2 to a substantially horizontal position the cranks 43 will come into engagement with the brackets 44 on the door, and then the further actuation of the lever 41 from a horizontal position to a downward position (shown in Fig. 3) will cause the door to be lifted up out of its rabbet and out of its seat in the door-casing to the position shown in said figure. When the door is thus lifted out of its place or detached from the building or door-casing, the rod 30 on the upper end of the door will be moved up out of the brackets 32 into a holder 50, that extends downward from the hanger 51, carrying the roller 52. There is a hanger at each side of the door-moving means, secured rigidly at each end of the upper cross-bar 38. These hangers are placed the same distance apart on the door-moving means as the brackets 32 on the front of the building. The holders 50 therefore cooperate with the brackets 32, and said holders 50 are provided with a pair of downwardly and inwardly extending arms corresponding to the parts of the brackets 32, but extending in an opposite direction, so that their ends may abut against the ends of the

brackets 32 and form a groove or channel in the holders and brackets that is continuous. Therefore when the door is elevated by the lifting means heretofore explained the cross-rod 30 on the door will be lifted from the grooves in the brackets 32 into the grooves in the holders 50, as shown in Fig. 3, so that said holders 50 hold the upper end of the door in place in the door-moving means after the door has been detached from the building and while it is being transported. After the door by means of the construction so far described has been detached and lifted into the position shown in Fig. 3 it may be pushed laterally out of the way, as shown in Fig. 1, and this is done without interfering with the other doors. This non-interference is secured by lengthening the arms 35, on which the track is mounted. The position of the door while detached is determined by the adjustment of the parts heretofore described with relation to each other and their relative sizes and lengths, as will occur to any mechanic.

When it is desired to close a door, it is pushed back on the track to the closing position, and then the lever 41 is moved outward from its downward position, which causes the cranks 43 to move the door downward and inward, so that the lower part of the door will enter its seat or rabbet, and then as the lever 41 is moved outward and upward to its uppermost position gravity will draw the entire door down into its seat, and as the rod 30 at the top enters the downwardly and inwardly extending grooves in the brackets 32 these brackets will draw the upper part of the door in tightly against the building, as shown in Fig. 5.

A modified form is shown in Figs. 7, 8, 9, 10, and 11. There the side bars 37 of the removing frame has the rod 60 connecting them near their upper ends below the rod 38, and on the rod 60 a pair of levers 61 are pivotally mounted between their ends, with a hook 62 on their inner ends adapted when the levers are operated to move in under the cross-rod 30 on the door. In these figures said rod 30 is secured to the doors by a straight upwardly-extending screw-bolt 63 instead of the strip 31 shown in the other figures. It is immaterial which connection is used. The outer ends of the levers 61 have pivotally connected to them the downwardly-extending bars 64, which are at their lower ends pivotally mounted, as shown in Fig. 10, to the side bars 65, forming, with the handle 42, a lever much of the same general character as that shown in Fig. 1 excepting the side bars 65 have an additional horizontal portion, to which the bars 64 are pivoted. The construction in the modified form is also changed in the feature that the rod 66 (shown in Fig. 10 only and corresponding to the shaft 40 in Fig. 1) is not a shaft, but merely a fulcrum on which the inner ends of the bars 65 have bearing. Said rod 66 is supported at its ends beyond the

bars 69 in arms 68, that are a continuation of the ends of the bar 65, as seen in Figs. 8 and 10. These arms 68 correspond in function to the part 43 in the form shown in Fig. 1, and they extend between the sides of U-shaped plate 69, that is secured on the timber 21 of the door and into a recess 70 in said timber. (Shown in Fig. 7 and in dotted lines in Fig. 8.)

From the foregoing description of the modified form it is apparent that when the hand-lever 42 is turned downward from a vertical position, (not shown,) but similar to the position of the hand-lever formed of the parts 41 and 42 in Fig. 2, the hooked lever 62 at the upper part of the construction and the arm 68 at the lower part will simultaneously move into engagement with the door, the lower part in the recess 70 and the upper part in under the rod 30. This occurs when said hand-lever is in a horizontal position, and when pushed still farther downward to the position shown in Fig. 9 the levers 61 and 68 will pick up the door and draw it upward and outward from the building. Then the door can be moved laterally, as desired, and is returned into position or replaced by a movement the opposite of that just described, whereupon the door will settle snugly into its seat and the rod 30 at its upper end engage the brackets 72, which are somewhat similar to the brackets 32 in the other figures, although no upper arm is needed, because they do not cooperate with anything like the oppositely-extending arms 50 in the other figures.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with a structure having a side opening, and a removable vertical door for closing said opening, of means mounted in connection with the structure detachable from the door and engageable therewith for removing or replacing the door.

2. The combination with a structure having a side opening, a horizontal track on said structure near said opening, and a removable vertical door independent of the track for closing said opening, of means movable on the track detachable from the door and engageable therewith for removing or replacing the door.

3. The combination with a structure having side openings and a plurality of removable vertical doors, of a track on said structure near said openings, and a single means supported and movable on said track for replacing any one of said doors.

4. The combination with a structure having a side opening, a horizontal track on said structure near said opening, and a removable vertical door for closing said opening, of means secured to the structure for supporting said door when closed, and means carried and movable on said track for removing said door from its supporting means or replacing the same.

5. The combination with a structure having a side opening, a horizontal track on said struc-

ture near said opening, and a removable vertical door independent of the track for closing said opening, of means on said structure independent of the door for supporting the door in a closing position, and means movable on the track and independent of the door and of said door-supporting means for removing the door from said supporting means or replacing it.

6. The combination with a structure having a side opening, of a horizontal track on said structure above the opening, a removable vertical door for closing the opening, brackets secured to the structure above the door for supporting the same while closed, and means movable on the track for removing the door from said brackets or replacing the same.

7. The combination with a structure having a side opening, of a removable vertical door, downwardly and inwardly inclined supports secured to the structure above the opening, means secured to said door for engaging said supports for holding the door closed, and means carried by the structure detachable from and engageable with said door for removing it from said support and replacing it on the same.

8. The combination with a structure having a side opening, of a removable vertical door, a transverse rod above the door and secured thereto, a pair of downwardly and inwardly inclined brackets secured on the structure above the opening therein for receiving said rod and supporting the door, and means carried by the structure detachable from or engageable with said door for moving said rod to and away from said brackets.

9. The combination with a structure having a side opening and a removable vertical door for closing said opening, of means mounted in connection with said structure that is detachable from but engageable with the door below the top thereof for removing and replacing the same, and catches on said removing means detachable from said door for engaging and holding the top of the door while it is being removed or replaced.

10. The combination with a structure, of a removable vertical door, a horizontal track secured to the structure above the door, and means detachable from the door suspended from and movable on said track and extending down in front of the door for engaging the door below the top thereof to remove or replace the same.

11. The combination with a structure, of a removable vertical door, a track secured above the door, a frame suspended from and movable on said track and extending down in front of the door, and a lever fulcrumed in said frame and detachable from the door which when operated engages the door and removes or replaces the same.

12. The combination with a structure, of a removable vertical door, a track secured to the

structure above the door, a frame movable on said track and extending downward therefrom, a lever fulcrumed in said frame and detachable from the door, and a catch on the door for said lever to engage when operated so that said door may be removed or replaced by said lever.

13. The combination with a structure having a side opening, a removable vertical door for closing said opening, and a track on said structure above the door, of brackets on the structure below the track and above the opening, means on the upper part of the door for engaging said brackets for supporting the door in its closing position, a frame suspended from and movable on said track and extending down in front of the door and detachable therefrom, and a lever fulcrumed on said frame and adapted to engage the door and elevate the same when operated.

14. The combination with a structure having a side opening, a removable vertical door for closing said opening, and a track on said structure above the door, of brackets on said structure below the track and above the opening, means on the upper part of the door for engaging said brackets for supporting the door in its closing position, a frame suspended from and movable on said track and extending down in front of the door and detachable therefrom, and a lever fulcrumed between its ends in said frame and adapted to engage the door and move the same simultaneously upward and outward when operated.

15. The combination with a structure having a side opening and a removable door for closing said opening, of a track secured to said structure above the door, a horizontal rod mounted in connection with said door and above the same, brackets secured to said structure above the opening adapted to receive said rod and support the door while closed, a frame movable on said track and extending down in front of the door, and a lever fulcrumed in said frame between its ends adapted to engage said rod and when operated move the door upward and outward.

16. The combination with a structure, of a plurality of removable vertical doors, a track above said doors, a frame suspended from and movable on said track to a position in front of any of said doors, and a lever fulcrumed in said frame for engaging a door for removing and replacing the same.

17. The combination with a structure, of a plurality of removable vertical doors, a horizontal track above the same, and means movable on said track for lifting any one of said doors outward away from the structure so that the same may be slidable by the other doors.

18. The combination with a structure having side openings and removable doors for closing said openings, of a track secured to said structure above said openings and extending to the front beyond the doors when closed, a frame

carried and movable on said track and extending downward, and a lever carried by said frame for engaging any one of said doors and removing it from its seat and supporting the same so that it will be supported far enough away from the structure to be slidable by the other doors.

19. The combination with a structure having side openings and removable vertical doors for closing said openings, of a continuous track above said side openings, means secured to the structure near each opening for removably supporting each door while closed, a frame mounted movably on said track and extending downward, and a lever mounted in said frame adapted to engage any one of said doors and remove it from its supporting means and support it on said track so as to be slidable by the other doors.

20. The combination with a structure having

side openings and removable vertical doors for closing said openings, of brackets secured to said structure above said openings for removably supporting each door while closed, a continuous track secured to the structure above said brackets and extending upward beyond said brackets and doors, a frame mounted movably on said track and extending downward, and a lever mounted in said frame for engaging any one of said doors and removing it from said brackets and supporting the same so that it will be slidable by the other doors.

In witness whereof I have hereunto affixed my signature in the presence of the witnesses herein named.

JOHN R. HUSSEY.

Witnesses:

V. H. LOCKWOOD,
NELLIE ALLEMONG.