

March 7, 1933.

D. J. WALLACE

1,900,422

ENTRANCE CONTROL

Filed Nov. 13, 1928

3 Sheets-Sheet 1

Fig 1

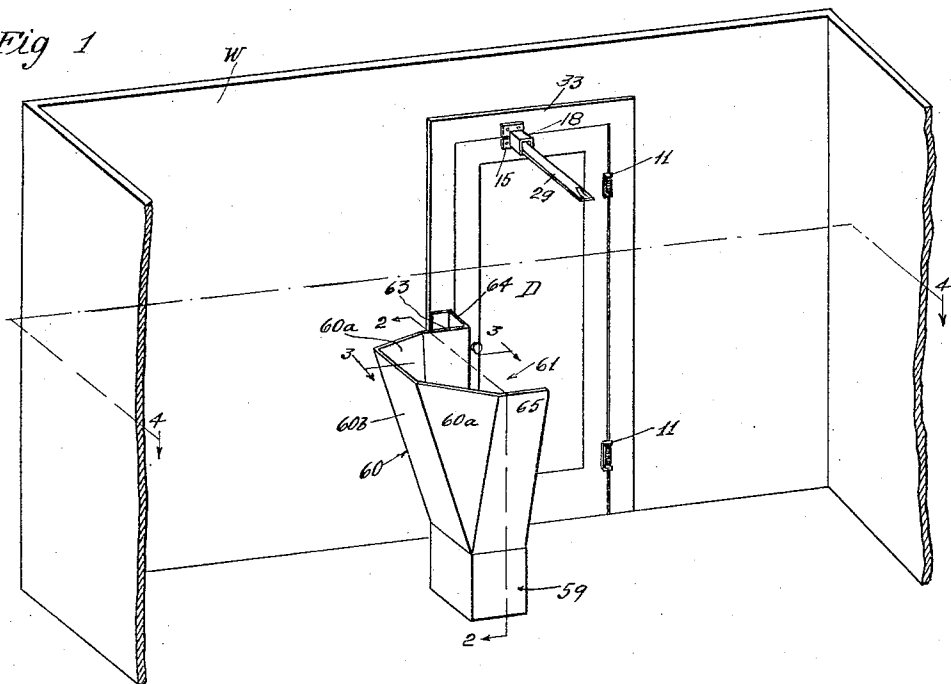


Fig 2.

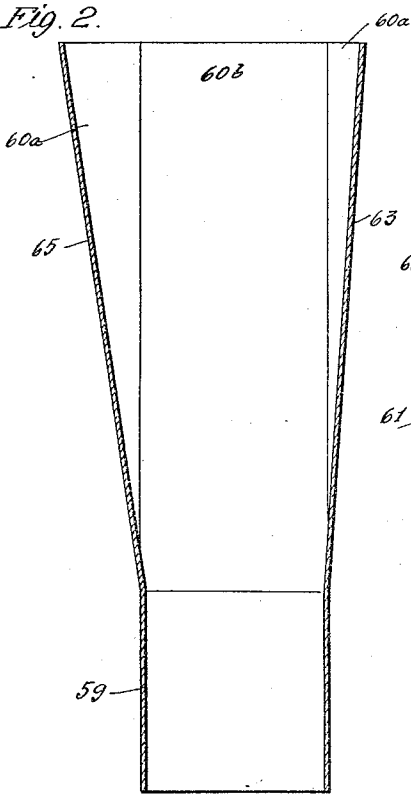
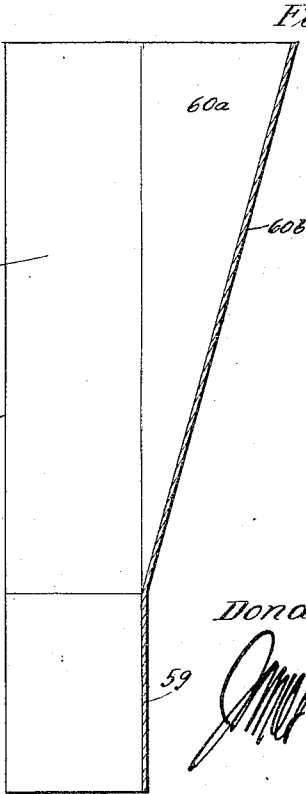


Fig 3.



Inventor.
Donald J. Wallace.

James T. Threlkeld

Attorney.

March 7, 1933.

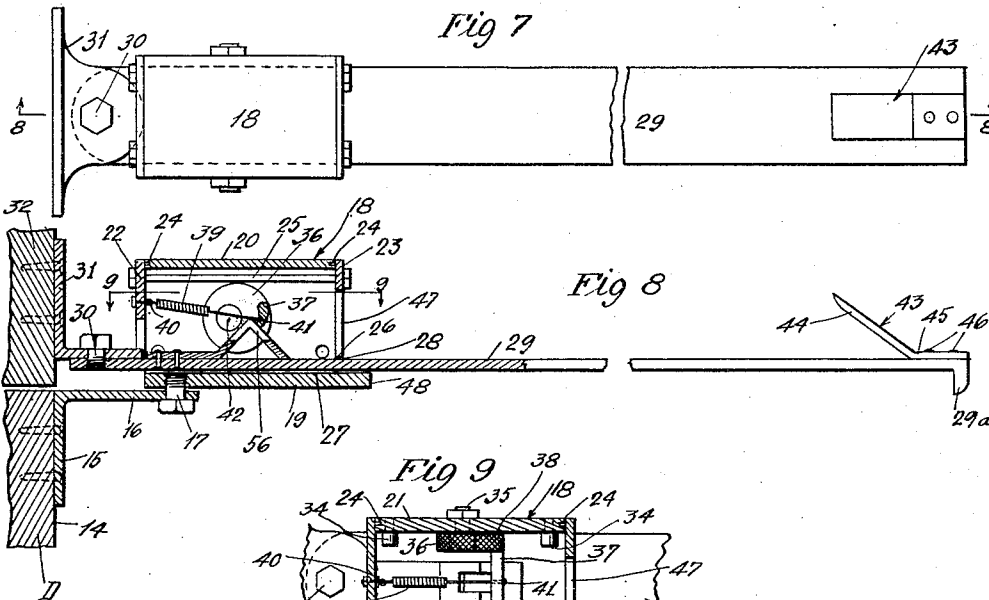
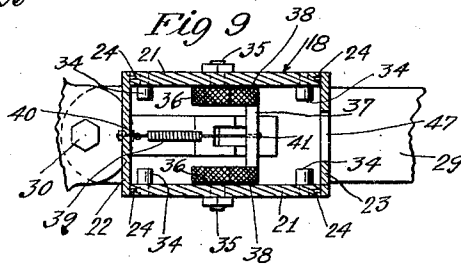
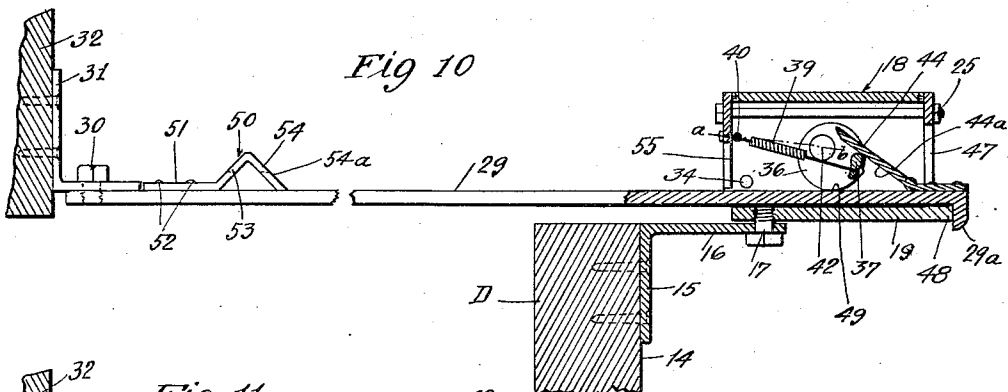
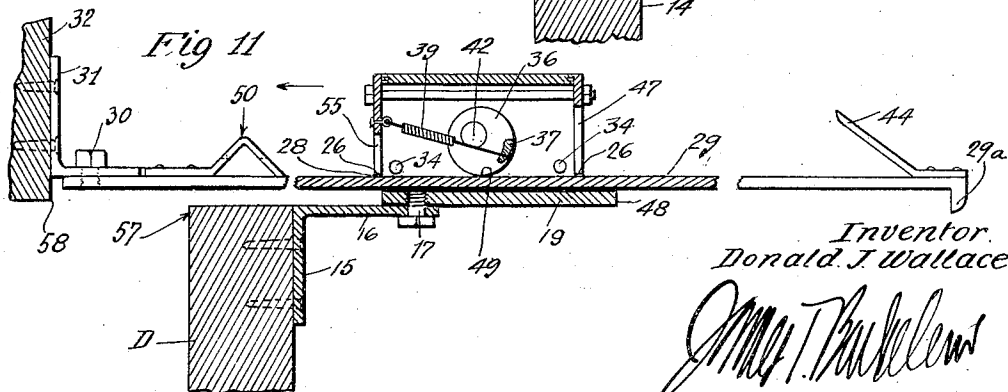
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3 Sheets-Sheet 3



Inventor.
Donald J. Wallace.

James T. Threlkeld
Attorney.

UNITED STATES PATENT OFFICE

DONALD J. WALLACE, OF LONG BEACH, CALIFORNIA, ASSIGNOR OF ONE-HALF TO
ROLAND H. MULFORD, OF LONG BEACH, CALIFORNIA

ENTRANCE CONTROL

Application filed November 13, 1928. Serial No. 319,115.

This invention relates generally to entrance controls, and its particular nature may be described as means for preventing the passage of more than one individual at a time from one room or the like, to another room, or the like, the closure for the entrance way being so controlled that a given individual must have passed completely through the way and have shut the closure before a second individual may subsequently gain entrance.

In order better to point out the particular advance of the present invention, mention will be made of certain commonly used devices for controlling entrances, certain of their disadvantages being pointed out, not in a spirit of derogation, but in order that features of my arrangement may become clearly apparent by showing how they eliminate these disadvantages. I will also describe the invention as being put to use in a particular situation. This is done merely to gain the advantage of a concrete example whereupon it will become apparent how the invention may be put to advantageous use in other situations. It is in no way to be construed as limiting the invention to the chosen illustrative situation.

In public comfort stations it is customary to provide coin-controlled locks on the doors of toilet compartments and if there be any appreciable number of compartments the cost of lock installation and up keep is a very considerable item. In the absence of attendants, it also becomes possible for a defeat of the purpose of the locks, since a compartment occupant may hold the door open upon leaving and admit a second individual without actuation of the coin controlled lock. The money lost to proprietors by reason of this is astonishingly great.

To overcome these conditions, I provide a comfort room wherein the individual compartments are not coin-controlled, but the same effect is gained by utilizing a coin-controlled lock on the door of the room entrance. A single coin-controlled lock installation thus suffices to serve the purpose, with an attendant reduction in the cost of lock installation and up keep, and, since the doorway

is exposed and can be kept under the eye of a single attendant, the chances of trickery are lessened.

However, my invention goes much further than the mere provision of a door which is under the control of a coin-released lock. As will become apparent, it dispenses with the necessity of an attendant. Instead of utilizing a turnstile which has the disadvantages of allowing more than one person to crowd between the horizontal bars and of placing the user in an awkward and sometimes embarrassing position while walking through, I have provided an enclosure adjacent to the doorway of the room, which enclosure will accommodate only a single individual, but in which that individual may stand while the controlled door is being swung in one direction or the other, depending upon which side of the room the compartment is placed. It is only while the individual is standing in this compartment that entrance may be gained to the room, the question as to whether the door is first swung open to admit the user to the compartment or the user entering the compartment before the door is initially swung open depending again upon the relative positioning of the compartment and the direction of door opening movement.

With it thus established that the door can only be opened by the insertion of a proper coin, that entrance to the room cannot be gained except from the compartment and that but a single individual can occupy the compartment at a given time, to insure that the device be protected against trickery, it is only necessary to insure further that once the door has been initially opened, it cannot be reopened until it has first gone substantially fully shut. This prevents the insertion of an obstacle between the door and its frame so that, one individual having passed through and preventing the door from going fully closed, another individual cannot push the door open from this partially closed position.

Since the door must be practically closed after an individual has entered the compartment before that individual can enter the

room, it is impossible for the door to be held half way open while one individual steps out of the compartment into the room and another individual steps from the outside into the compartment.

Further objects and novel features of the invention will be made apparent in the following specification, reference being had to the accompanying drawings in which

Figure 1 is a perspective view of an installation showing my invention.

Fig. 2 is an enlarged detail section on line 2—2 of Fig. 1.

Fig. 3 is an enlarged detail section on line 3—3 of Fig. 1.

Fig. 4 is a section on line 4—4 of Fig. 1, showing in addition, an exit turnstile.

Fig. 5 is a view similar to Fig. 4 but showing the door partly open.

Fig. 6 is a view similar to Fig. 4 but showing the door fully open.

Fig. 6a is a diagrammatic view generally similar to Fig. 4 but showing a slight rearrangement of elements.

Fig. 7 is a top plan view of a door brake or controlling member.

Fig. 8 is a section on line 8—8 of Fig. 7.

Fig. 9 is a section on line 9—9 of Fig. 8.

Fig. 10 is a section similar to Fig. 8 but showing the door in fully opened position; and

Fig. 11 is a view similar to Fig. 10 but showing the position of parts as the door is being closed.

As stated above, while I will describe the invention as applied in a particular situation, it will be understood this is in no way to be construed as limiting my broader claims. Thus, while I have indicated the entrance control generally at E as being between an outer room S and an inner room R, said entrance being associated with the common wall W of these rooms, it will be seen the invention more broadly contemplates the consideration of rooms R and S as spaces separated by barrier W, entrance control E making possible passage between said spaces and through the barrier in a given direction, only. It will also be seen that the enclosure generally indicated at 10 and making up a part of the device which will be described in detail later, may be considered as a compartment intermediate spaces S and R. With these general considerations in mind, I will hereinafter refer to the spaces as being rooms and will consider that the control is such that only one individual at a time may enter room R from room S, passage in the opposite direction being prevented by means to be described. Exit from room R is had through the turnstile conventionally indicated at T, said turnstile being controlled in any well known manner to prevent passage therethrough into room R.

In order that the operation of the entrance

may be better understood, it will be helpful first to consider the means for controlling the movement of door D. It may be stated at this time that while certain elements of this door controlling mechanism are novel, per se, and have therefore been made the subject matter of certain claims, the broad proposition of the entrance control which embodies both door control means and means controlling the individual's action in permitting him to gain entrance after the coin release has been operated, does not call for a particular door controlling mechanism, and therefore such claims as do not specify such a particular mechanism are in no way to be construed as being limited by my description of the particular mechanism here employed.

Door D is hingedly mounted at 11 for movement to and from a position closing doorway 12 in wall W. This door is normally locked closed by a coin-release lock conventionally illustrated at 13. This lock is controllable only from the outside of the door, so there is no possibility of an occupant of room R opening the door to admit individuals from room S. Any suitable means is provided for urging the door normally to closed position, for instance, hinges 11 are here shown as of the spring type. These spring hinges have sufficient strength to close the door and allow the spring latch of lock 13 to lock the door closed irrespective of the extent to which the door has previously been opened.

I will now describe my preferred means for limiting the extent of door-opening movement which is combined with means for controlling door movement after lock 13 has been released. It will be understood that it is not essential to the invention, considered in its broader aspects, either to combine these means or to provide the particular means here shown and described. However, since the illustrated means are particularly effective in use and are, I believe, novel in themselves, I will describe them with some particularity.

Mounted on the inner face 14 and at the top of door D is a bracket 15, arm 16 thereof extending horizontally. Secured to arm 16 at 17 is a brake housing generally indicated at 18. This housing includes bottom wall 19, top wall 20 and side walls 21. End plates 22 and 23 are positioned by dowel pins 24 and are held detachably against separative movement by through bolts 25. As will hereinafter appear, these bolts preferably, though not necessarily, have an additional function in connection with the brake discs.

End plates 22 and 23 stop short at 26 of the upper face 27 of bottom 19, leaving end slots 28 through which extends an elongated bar 29, this bar being pivotally held at 30 to a bracket 31 which is secured to the cross rail 32 of door frame 33. Extending inwardly

from side walls 21 are guide studs 34 which overlie bar 29. These studs with bottom wall 19 provide a guide between bar 29 and the brake housing, it being understood that said bar and housing have sliding fit. When the door is moved hingedly, housing 18 slides along the bar 29, pivotal connection 30 allowing swinging movement of said bar to accommodate the arcuate movement of the door and hence of the housing.

Eccentrically mounted at 35 on side walls 21 are the axially aligned brake discs 36, these discs being connected by a cross rod 37 which is disposed approximately diametrically opposite the eccentric axis 42 of the discs. The peripheral faces of the discs are preferably, though not necessarily, knurled or otherwise mutilated at 38 to give them superior gripping or biting characteristics.

A coil spring 39 is secured at one end 40 to end wall 22, and at the other end 41 to cross bar 37. The points of attachment are such that this spring normally tends to rotate discs 36 in a counter-clockwise direction, as viewed in Fig. 8, thus drawing said discs clear of or at least out of effective pressural contact with the upper surface of bar 29. The contact of the discs with bolts 25 limits this counter-clockwise disc movement and when the discs are thus put in the position of Fig. 8, the points of attachment of the spring to wall 22 and to cross rod 37 are above the eccentric axis 42 of the discs and said discs are thus normally and yieldingly retained in a position out of effective engagement with bar 29.

With the discs in the above described position they offer no resistance to door opening movement. Accordingly, after lock 13 has been released by the insertion of a proper coin, the door D may be swung inwardly (counter-clockwise as viewed in Fig. 4) against the action of the spring hinges.

Secured to the upper side of bar 29 near its free extremity is a setting cam 43, this cam being in the nature of an upward angular arm 44 and an attachment portion 45, the latter being riveted to the bar at 46. Cam arm 44 inclines upwardly and inwardly toward housing 18, the end plate 23 of the housing being centrally cut away as at 47 to accommodate the setting cam when housing 18 is moved to the position of Figure 10.

When the door approaches its position of full-open, cross-rod 37 is brought beneath cam arm 44 and, after contact between said cam and cross rod, further opening movement of the door causes member 44 to cam rod 37 downwardly to the position of Figure 10, thus causing clockwise rotation (as viewed in Figures 8 and 10) of brake discs 36. Such movement of the discs carries them into pressural contact with the upper face of bar 29, the point of attachment of spring 39 to rod 37 then being below eccentric axis 42 whereby

the spring thereafter exerts a tendency to rotate the cam discs in a clockwise direction or into engagement with the cross bar, thus tending to press said bar against the upper face of bottom wall 19.

While the contact of cross rod 37 with cam 43, after the discs have been rotated as far as possible under the influence of the cam, may be depended upon to limit the extent of door opening movement, I prefer to provide positive stop means which becomes effective after the discs have been moved to braking position, thus relieving the cams, cross rod and cam from the sometimes excessive strains incident to door stopping. For this purpose I have provided the end of bar 29 with a downturned lip 29a against which the end 48 of bottom 19 is adapted to abut to prevent further door opening movement after cross rod 37 has been cammed sufficiently to rotate the discs from their position in Figure 8. It will be understood that while I have shown cam 43 as positively rotating the cam discs clear to their braking position, it is only necessary that said cam rotate the discs until the point of spring attachment with said rod is below that line *a-b* (Fig. 10) which is common to point of attachment 40 and eccentric axis 42, whereupon said spring is effective to rotate the discs to braking position.

With the discs thus put in braking position, it will be understood they are not effective to prevent door closing movement, that is, movement of the door to the left in Figures 10 or 11, for the point 49 of engagement between the cam discs and bar 29 is at the right of eccentric axis 42 so that leftwise movement of housing 18 along the bar tends to rotate the cam discs in a counter-clockwise direction against the action of spring 39, that is, tends to rotate them in a releasing direction. The brake discs are thus merely dragged along the bar as long as the door is moved towards closing position. However, once the brake discs are in this position, any attempt to move the door back towards the free end of the bar or in a door-opening direction, results in the discs being revolved in a clockwise direction, due to the frictional contact between the discs and bar as aid by the nature of peripheral surface 38, the bar thus being tightly pinched between the discs and bottom wall 19. This pinching is effective to prevent door opening movement until the discs have been thrown to a full-released position by means which are now to be described.

Fixed to the upper face of bar 29 near its pivoted end is a brake releasing cam 50, this cam being made up of an attachment portion 51 riveted to the bar at 52, an upwardly extending portion 53, and a downwardly extending cam portion 54 which inclines in substantially the same direction as cam arm 44. However, while the under side 44a of extension 44 is the effective cam surface, it is

the upper side 54a of member 54 which is the effective cam surface. The lower part of this cam surface 54a is in line with rod 37 when the discs are in braking position, end
 5 plate 22 having an opening 55 to pass said cam and said cam being centrally notched at 56 to accommodate the centrally arranged spring 39. The cam 50 is so located that after corner 57 of door D has passed beneath corner
 10 58 of frame member 32, (that is, when the door is substantially closed) cross bar 37 is engaged by face 54a so that by the time the door is fully closed said rod will have been moved to the position of Figure 8, the brake
 15 discs thus being moved to released position, in which position they are releasably held by spring 39 until again shifted by cam 43.

It will thus be seen that the braking device is normally ineffective and remains ineffective
 20 during initial door opening movement, that it becomes effective as soon as the door has reached a predetermined open position to prevent, after the door has started closed, subsequent door opening movement until said
 25 door has gone substantially fully closed, preferably to a position of closure where the spring latch of lock 13 may engage its keeper (not shown) to lock the door closed.

As will be pointed out hereinafter, means
 30 are provided whereby an individual may not secure entrance to room R until the door has successively been fully opened and substantially fully closed. It follows that this brake
 35 device prevents such an individual from holding the door from going fully closed so that a second individual may push the door open again without inserting a coin in the lock. Also, should an individual place an
 40 obstruction between the door and the frame to hold the door slightly ajar so the lock cannot become effective with the idea that a second individual may subsequently push the door open without payment, it will be seen
 45 that the brake device prevents this second individual from so pushing the door open until he has first removed the obstruction and allowed the door to go fully closed, whereupon he is forced to deposit a coin before he
 50 can release the lock.

At this point it may be stated that while I have specified lock 13 as being of the coin-release type since this is the provision most
 55 commonly used, it will be understood the lock may be of any of the well known types having provisions whereby certain satisfaction has to be given it before it can be operated. In
 60 other words, it may be under remote or direct control of an attendant to whom satisfaction must be given before he releases the lock. It will also be noted that the brake device and bar may be fully housed to prevent tampering, but I have omitted a showing of the housing in order that all working parts may
 65 be exposed.

I will now describe my means for control-

ling the movements of the individual as he makes his entrance. I have designated this means generally at 10 and it may be characterized as an enclosure defining a compartment 10a through which the individual must
 70 pass in going from room S to room R. I have shown this enclosure in the nature of a shoulder high cage, but it will be understood it may be built integrally with the walls of the room or may be fashioned in any way
 75 suitable to carry out the hereinafter described purpose without departing from the spirit and scope of my broader claims.

Enclosure 10 includes a lower portion 59 and an upper portion 60, it being noted that
 80 it is provided with an entrance way 61 adjacent doorway 12. Lower portion 59 may be considered as relatively restricted, being of a size, as viewed in plan, to approximately
 85 fit about the feet and lower legs of a standing individual. This lower portion preferably extends about average knee height, the upper portion 60 flaring in every direction as
 90 shown particularly in Figures 2 and 3 (the flare being accomplished by inclining wall sections 60a, 60b, 63 and 65) so the individual therein may not be required to assume an un-
 95 natural or awkward position, these flaring characteristics allowing him freely to move his body, except his feet. From one side wall 63 is an extension 64 which reaches to door
 100 frame 33, so, when door D is opened, an individual may not pass through doorway 12 and between wall W and enclosure 10 directly into room R. Enclosure 10 is so angularly
 105 arranged, as viewed in plan, that it substantially follows the arc of door movement, and the width d of entrance way 61 and the thickness of door D, which may be superficially increased at its outer edge as by a lip 62, are
 110 such that an individual may not enter or leave said compartment when the door is in any position other than fully opened as in Fig. 6 or closed to an extent bringing it past wall 63. The limit of door opening move-
 115 ment, as established above, is such that said door, when fully open is in the position of Fig. 6, that is, approximately opposite enclosure wall 65, it being noted that this wall as well as the outer edge or wall 63 are suf-
 120 ficiently close to the edge of the door to prevent an individual from stepping around the door edge either into or out of the compartment.

The use of the entrance is as follows:

The individual first releases lock 13 by the insertion of a proper coin, swings the door open to the position of Fig. 6 and steps into compartment 10a. As stated above, due
 125 to the restriction of portion 59, no more than one individual can get into this compartment, though one individual is accommodated comfortably. It will further be noted that in order for the individual to step into the compartment he must have fully opened the door,
 130

thereby bringing the braking device into play which forces a full door closure before the door can again be swung open. Consequently, it will serve no purpose to block the door partly open either by holding it or interposing an obstacle between the door and frame.

The individual then releases his hold on the door knob and hinges 11 swing it shut. If he attempts to check the door when it is partly closed, for instance in the position of Fig. 5, so he may step into the room R and allow another individual to step between the door and wall 63 into the compartment, his purpose will be defeated, for the edge of the door will block entranceway 61 sufficiently to prevent either of these actions. He cannot step into room R until door D has reached or passed wall 63 and by that time no second individual can squeeze his way into the compartment past the door nor can said second individual force the door open from this position sufficiently to allow his entrance to compartment 10a, due to the braking provisions described above. Accordingly, door D must go fully closed and locked before it can again be pushed open to admit a second individual to compartment 10a, and such entry is gained only after the deposit of another coin in lock 13.

Just as a second individual from the outside cannot swing the door open until it has first gone fully shut, neither can the first individual, now within room R, pull the door open to admit a second user. Of course, once the door has gone fully closed lock 13 is not accessible from the inside of room R and occupants of said room are unable to release the door.

It will be seen that the device as above described may be considered as including an enclosure at one side of wall W; the entrance way 61 to said enclosure, door way 12 and door D being associated in such a manner that entrance to enclosure 10 from room S can be made only when the door is opened a predetermined extent (which may normally be considered its full open position) and that subsequent passage from enclosure 10 to room R can only be had when said door is substantially closed. It will also be seen that the brake device may be considered as means which are ineffective during initial door opening movement but prevent subsequent door opening movement after said door has been moved towards closed position, remaining effective until the door has so moved a predetermined extent toward closed position.

It may be also seen that the opening P between wall 65 of enclosure 10 and hinges 11 may be considered as an exit from enclosure 10, door D closing this exit as soon as door way 12 and entrance way 61 are in communication and that said door prevents communication between room S and compart-

ment 10 through door way 12 and entrance way 61 when door D is in a position opening exit P.

Considering rooms S and R as being spaces separated by a barrier in the form of wall W, it will be seen that entrance E includes a compartment 10a intermediate the spaces, the compartment having an entrance way which is capable of putting said compartment in communication with either space S and space R, while door D represents a single member which is movable selectively to prevent passage between said compartment and either of said spaces or as a member preventing passage between the compartment and either of the spaces when said compartment is in communication with the other space.

It will also be understood compartment 10 may be on either side of wall W. If it be put on the side opposite that shown, the door also will swing in the opposite direction and the individual steps into the compartment before he unlocks and opens the door. Such an arrangement is diagrammatically shown in Fig. 6a but it will be understood the general principle of operation remains the same as that described in detail above.

It will be understood the drawings and description are to be considered merely as illustrative of and not restrictive on the broader claims appended hereto, for various changes in design, structure and arrangement may be made without departing from the spirit and scope of said claims.

I claim:

1. In a device for controlling the passage of individuals from a space to the interior of a room adjacent said space, one of the defining walls of the room having a doorway opening into said space, a door mounted for movement to and from a position closing said doorway, means limiting the extent of door-opening movement, a lock releasably holding said door closed, a stationary enclosure at one side of said wall and into which an individual may pass, said enclosure having an open entrance way normally opening into said room, said door, during at least a portion of its opening movement substantially closing said entrance way against the passage of an individual through the doorway into said enclosure, said door, when it is substantially at its limit of opening movement, opening said enclosure entrance-way to permit passage of an individual through said doorway into the enclosure and closing off communication between said enclosure and said room, said door being then movable to closed position putting the enclosure again into communication with the room whereby the individual may pass from the compartment to the room.

2. In a device for controlling the passage of individuals from a space to the interior of a room adjacent said space, one of the defin-

ing walls of the room having a doorway opening into said space, a door mounted for movement to and from a position closing said doorway, means limiting the extent of door-opening movement, a lock releasably holding said door closed, a stationary enclosure at one side of said wall and into which an individual may pass, said enclosure having an open entrance way normally opening into said room, said door, during at least a portion of its opening movement substantially closing said entrance way against the passage of an individual through the doorway into said enclosure, said door, when it is substantially at its limit of opening movement, opening said enclosure entrance-way to permit passage of an individual through said doorway into the enclosure and closing off communication between said enclosure and said room, said door being then movable to closed position putting the enclosure again into communication with the room whereby the individual may pass from the compartment to the room, and a door-opening brake applied to the door, which brake is ineffective when the door is closed, said brake preventing, after initiation of such door-closing movement, subsequent door-opening movement until after the door has been closed.

3. In a device for controlling the passage of individuals from a space to the interior of a room adjacent said space, one of the defining walls of the room having a doorway opening into said space, a door mounted for movement to and from a position closing said doorway, means limiting the extent of door-opening movement, a lock releasably holding said door closed, a stationary enclosure at one side of said wall and into which an individual may pass, said enclosure having an open entrance way normally opening into said room, said door, during at least a portion of its opening movement substantially closing said entrance way against the passage of an individual through the doorway into said enclosure, said door, when it is substantially at its limit of opening movement, opening said enclosure entrance-way to permit passage of an individual through said doorway into the enclosure and closing off communication between said enclosure and said room, said door being then movable to closed position putting the enclosure again into communication with the room whereby the individual may pass from the compartment to the room, and a door-opening brake applied to the door, which brake is ineffective when the door is closed, means putting said brake into effect when the door is opened said predetermined extent, said brake then being effective after initiation of door closing movement to prevent subsequent door-opening movement, and a brake release adapted to release the brake as said door finally closes.

4. In a device for controlling the passage of individuals from a space to the interior of a room adjacent said space, one of the defining walls of the room having a doorway opening into said space, a door mounted for movement to and from a position closing said doorway, means limiting the extent of door-opening movement, a lock releasably holding said door closed, a stationary enclosure at one side of said wall and into which an individual may pass, said enclosure having an open entrance way normally opening into said room, said enclosure being characterized as a structure having a relatively restricted foot receiving space to accommodate the feet of but one individual, the structure flaring upwardly and outwardly from the foot accommodating space to define a space of relatively large size, said door, during at least a portion of its opening movement substantially closing said entrance way against the passage of an individual through the doorway into said enclosure, said door, when it is substantially at its limit of opening movement, opening said enclosure entrance-way to permit passage of an individual through said doorway into the enclosure and closing off communication between said enclosure and said room, said door being then movable to closed position putting the enclosure again into communication with the room whereby the individual may pass from the compartment to the room.

5. In a device for controlling the passage of individuals from one space to another space through a barrier separating the spaces, a stationary, open front enclosure defining a compartment adjacent to the barrier and intermediate the spaces, said compartment being capable of receiving an individual therein and of being put into communication with either of said spaces to allow an individual to pass from one space to the other through said compartment, a door shiftable from one position to another alternately to prevent passage between the compartment and the individual spaces, all in a manner whereby an individual entering the compartment from the space in communication therewith may, after said door has been shifted, enter the other space from said compartment; a lock adapted releasably to hold the door in one of said positions, a normally ineffective brake mechanism applied to the door, means putting said brake into effect when the door is at said other position, said brake, when effective and after movement of the door from said other position has been initiated, preventing subsequent movement of the door towards said other position until the door has been returned to said one position, and brake-release mechanism adapted to release the brake when the door reaches said one position.

6. In combination with a stationary room-

defining structure having a doorway, a door movable to and from a position closing the doorway, a brake device adapted to prevent door opening movement only after the door
5 has been opened a predetermined extent and then moved toward but not fully to closed position; said brake device embodying a brake element carried on the door and a brake element carried on the structure, said ele-
10 ments being out of operative association when the door is closed, brake-setting means carried by the structure and adapted to put said elements into operative braking association by virtue of door opening movement to a pre-
15 determined extent, and brake release means carried by the structure to put one of said elements out of operative braking association with the other element, said release means being actuated by virtue of final closing move-
20 ment of the door.

7. In enclosure for controlling the passage of individuals through a predetermined path a wall structure having an entrance way, the lower part of the wall structure defining a relatively restricted foot-receiving space, and
25 the wall structure above said lower part flaring upwardly and outwardly from the foot-receiving space to define a space of relatively large size.

30 In witness that I claim the foregoing I have hereunto subscribed my name this fifth day of November 1928.

DONALD J. WALLACE.

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