



No. 849,775.

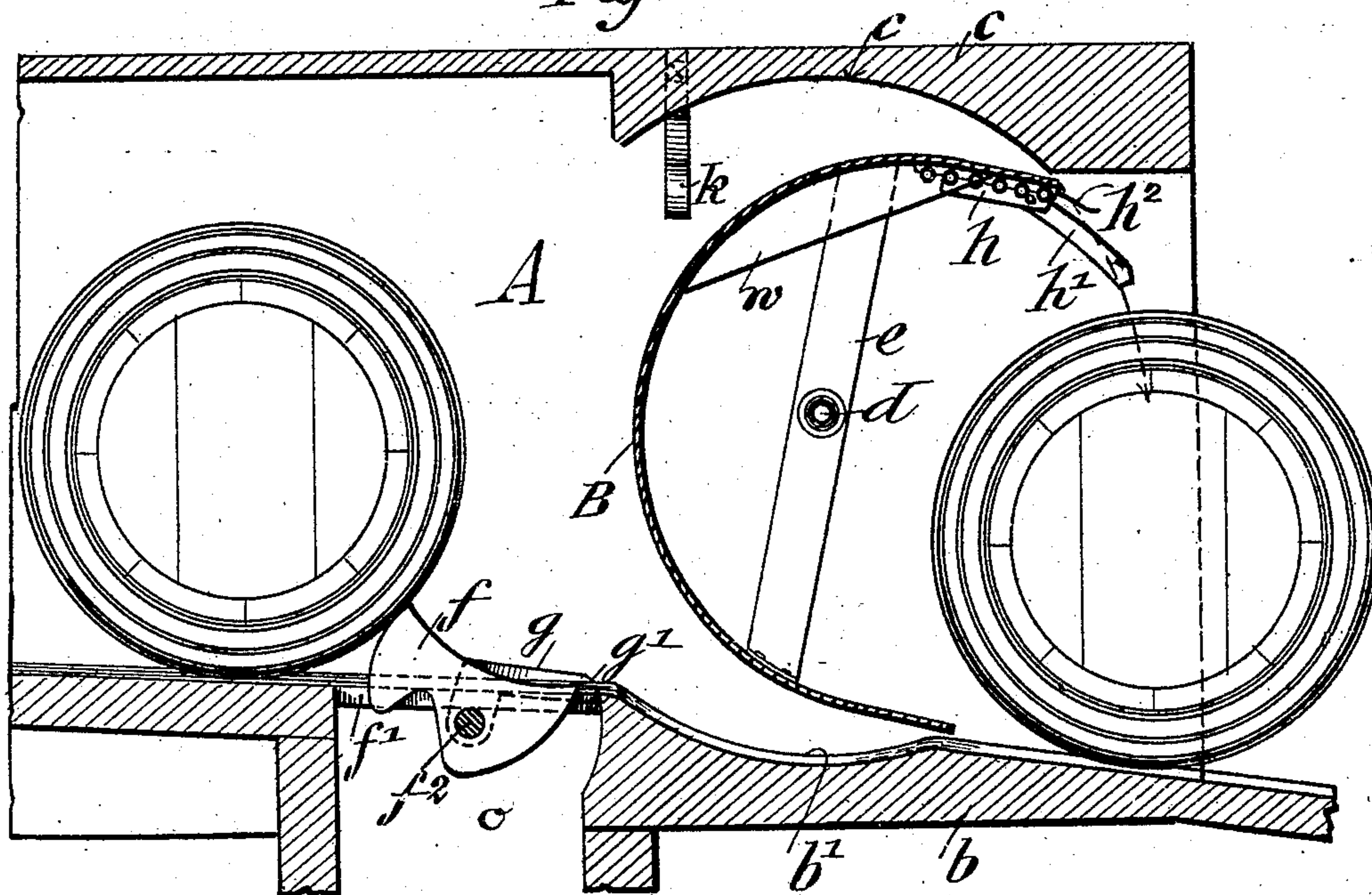
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J. F. DRUCKER.  
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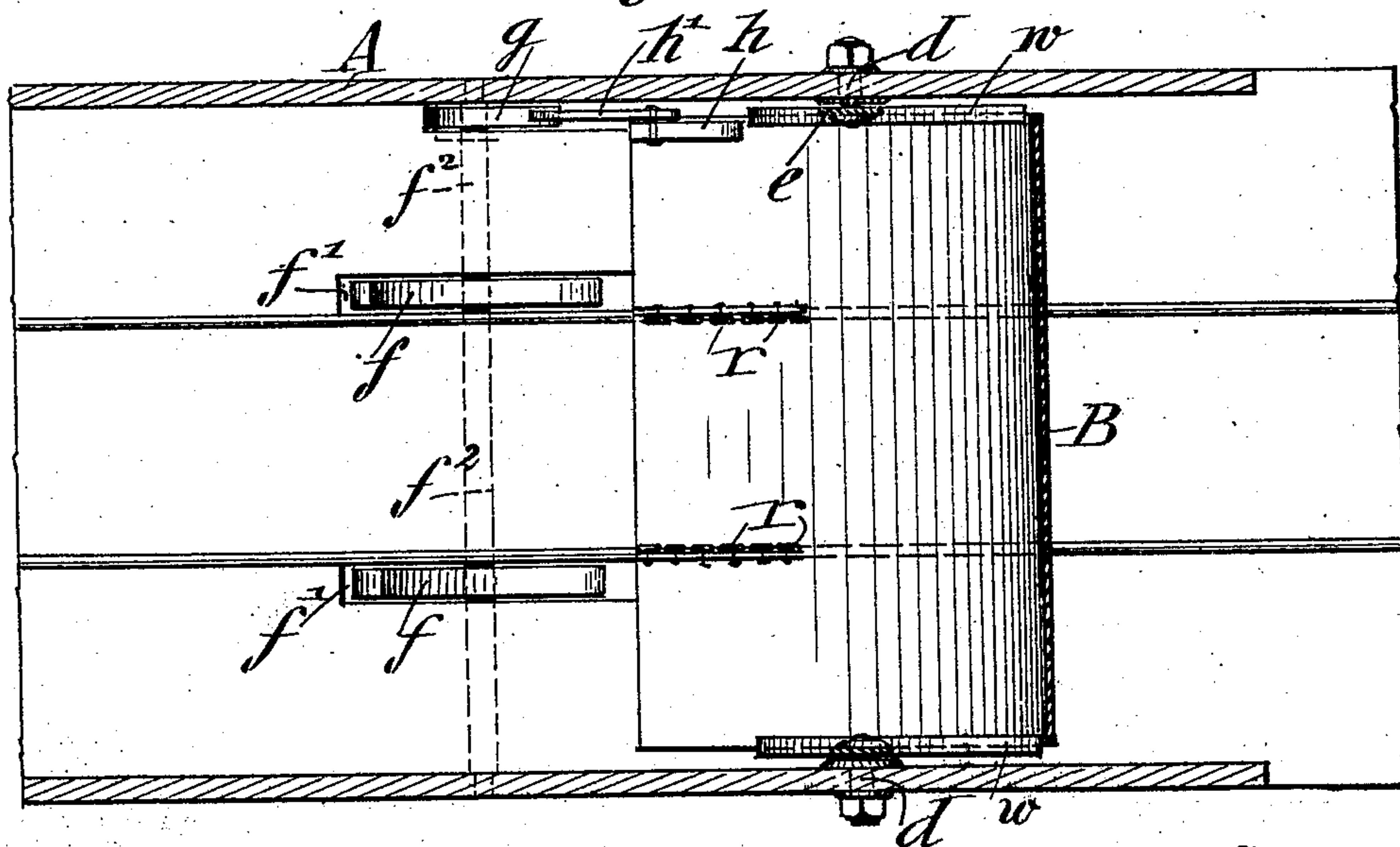
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2 SHEETS--SHEET 2.

*Fig: 3.*



*Fig:4.*



Witnesses

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# UNITED STATES PATENT OFFICE.

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## SWING-DOOR FOR COLD-STORAGE ROOMS.

No. 849,775.

Specification of Letters Patent.

Patented April 9, 1907.

Application filed March 24, 1906. Serial No. 307,864.

*To all whom it may concern:*

Be it known that I, JOHN F. DRUCKER, a citizen of the United States, residing in New York, in the borough of Manhattan, county and State of New York, have invented certain new and useful Improvements in Swing-Doors for Cold-Storage Rooms, of which the following is a specification.

This invention relates to doors for cold-storage rooms; and the object of the invention is to provide an improved door of this type by which barrels may be delivered from a cold-storage room without raising the temperature of the latter and in which the outward passage of such barrels is automatically controlled.

The invention consists in the novel features of construction and combinations of parts to be hereinafter described, and finally pointed out in the claims.

In the accompanying drawings, in which the same parts are denoted by the same reference characters throughout, Figure 1 is a vertical longitudinal section through a door for cold-storage rooms constructed in accordance with the invention, showing the parts in their normal position. Fig. 2 is a similar section showing the door at one stage of its operation. Fig. 3 is a similar section showing another stage in the operation of the door, and Fig. 4 is a horizontal section on line 4 4, Fig. 1.

Referring to the drawings, A denotes a casing leading from a cold-storage room and having an outer open end *a*. The casing A is of such size as to permit barrels to be rolled through the same, and the floor *b* of said casing is inclined downwardly and outwardly, as shown, in order that such barrels may pass through said casing by their own weight. Near the outer end of the casing A and located in the floor *b* and top *c*, respectively, are arcuate portions *b'* *c'*, one above the other. A swing-door B is arranged in the space between the arcuate portions *b'* *c'* of the casing, and said door is made of concavo-convex form, being approximately semicircular in cross-section and having flat top and bottom edge portions designed to move in close proximity to the arcuate portions of the casing. Said door B is journaled horizontally in the casing A by means of stud-bolts *d*, located in the side walls of said casing and engaging braces *e*, traversing the open por-

tions of the door B at the ends of the same. The braces *e* connect the top and bottom portions of the door B in such a way that said braces are arranged intermediately between the back of the concavo-convex portion of said door and a line connecting the top and bottom edges of said door. By this arrangement and by reason of the fact that the door B if continued to form a cylinder instead of being semicylindrical, as shown, would have a diameter less than the distance between the arcuate portions *b'* *c'* of the casing the door B is spaced from said arcuate portions at a comparatively great distance, except at the top and bottom edges of the former.

At either end of the door B the same is provided with weights *w*, which normally hold said door in the position shown in Fig. 1 and which when said door is rocked upon its axis return it to such position. Said door is further provided at its lower part with transversely-disposed rows of antifriction-rollers *r*, which are suitably journaled upon the inner surface of said door. At one end of the door B, at the lower edge thereof, is placed a block *h*, and said block has pivoted thereto an arm *h'*, which is resiliently supported in the position shown in Fig. 1 by means of a leaf-spring *h<sup>2</sup>* engaging the lower edge thereof.

Operating in a recess *o* in the floor *b*, which recess is arranged in advance of the arcuate portion *b'*, are a plurality of stop-levers *f*, passing upwardly through slots *f'*, extending longitudinally to said floor, as shown in Fig. 4. The levers *f* are mounted upon a shaft *f<sup>2</sup>*, which extends transversely to the casing A within the recess *o*, said shaft being journaled in the side walls of said casing, as indicated in Fig. 4. Said shaft is so journaled in said side walls that there exists enough friction to hold the shaft *f<sup>2</sup>*, and consequently the levers *f*, in any position in which they are placed. The levers *f* are preferably formed with their upper edges curved in order to conform to the side wall of a barrel rolled over the same, as shown in Fig. 2.

Mounted upon one end of the lever-shaft *f<sup>2</sup>* at a point within the casing A is an elbow-lever *g*, having an arm which extends toward the arcuate portion *b'*, said arm having a rounded-off end *g'* lying near the path of the bottom edge of the door B. Said lever *g* is so arranged as to be engaged by the arm *h* of



the door, as shown in Fig. 1, and normally retained in raised position under the influence of the weights  $w$ , whereby the levers  $f$  are normally retained in the position shown in Fig. 1.

A spring-arm  $k$  depends from the top of the casing A and engages the upper side edge of the door when the latter is in the position shown in Fig. 1, and said door is so arranged with respect to the spring that the movement of the former so that its lower edge will rise above the level of the floor is prevented, said spring thus acting in the nature of a stop. Although the spring  $k$  limits the movement of the door in the direction indicated, its movement in the opposite direction is not retarded thereby.

The operation of the improved door is as follows: The barrels to be delivered from the cold-storage room are rolled downwardly toward the door B, and the first one moves by its momentum over the stop-levers  $f$ , which levers are normally maintained with their outer ends raised, as shown in Fig. 1. In passing over said levers, however, the barrel rocks the same about their common axis, as shown in Fig. 2, the upper edge of said levers conforming to the side wall of the barrel. Such barrel while still partially supported by the levers  $f$  engages the anti-friction-rollers  $r$  upon the inner surface of the semicylindrical door at the lower part thereof, and the weight of the barrel is sufficient to swing said door upwardly on its axis, the barrel acting in opposition to the weights  $w$  at the lower portion of said door. When the barrel has swung the door upwardly to a sufficient extent, the former passes by gravity between what is normally the lower edge of the door and the lower edge of the inclined floor  $b$ , as shown in Fig. 3. By this movement the edge of the door, which is normally uppermost, is swung downwardly, as shown in Fig. 3, and as a consequence the casing is permanently closed against the ingress of warm air. After the barrel has passed beyond the door it rolls downwardly to the exterior of the casing. As soon as the door B is disengaged by the first barrel the weights  $w$  will return said door to its normal position, (shown in Fig. 1,) said weights being so arranged that their center of gravity will not be thrown inwardly beyond the axis of the door when the latter is in the position shown in Fig. 3. It will be noted that owing to the rocking imparted to the stop-levers  $f$  by the first barrel said levers assume the position shown in Fig. 3, in which their inner ends extend upwardly in order to abut against and arrest the movement of the next barrel, as indicated in said figure. Said levers maintain this position by reason of the friction exerted on the shaft  $f^2$ , as previously mentioned, and also by the disposition of said shaft at the center of gravity of said levers. When one barrel has been discharged

from the casing, it is necessary that the levers  $f$  be automatically returned to their first position in order to release the next barrel. This operation is effected by the arm  $h'$ , which when the door swings back into its initial position will abut against the end or nose  $g'$  of the shaft-operating lever  $g$  and raise said lever to the extent shown in Fig. 1, said arm  $h'$  then sliding somewhat beyond said lever, as indicated. By the rocking movement imparted to the shaft  $f^2$  through the lever  $g$  the stop-levers  $f$  are automatically returned to their initial position and the next barrel released. The door continues to operate in the manner described as long as the barrels are rolled to the same, and such barrels are thus automatically delivered from the cold-storage room. The arm  $h'$  and the lever  $g$  being arranged at one side of the casing will not be engaged or interfered with by the outgoing barrels. The door B is limited in its movement so as to be properly engaged by the barrels by means of the spring  $k$ .

The improved swing-door described has the advantage that the door proper is actuated by the barrels themselves and permanently prevents the ingress of heated air into the cold-storage room.

A further advantage of the improved construction is the automatic and efficient operation of the stop-levers.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a door for cold-storage rooms, the combination, with a casing, of an approximately semicylindrical door journaled horizontally therein and arranged to swing upwardly, and means to swing said door back to its initial position.

2. In a door for cold-storage rooms, a casing, and an approximately semicylindrical door journaled therein and arranged to be swung upwardly by the outgoing barrel, said door being weighted to return it to its initial position after the passage of each barrel.

3. In a door for cold-storage rooms, the combination, with a casing having arcuate portions in the top and floor thereof, one above the other, of a door of semicircular cross-section journaled horizontally in said casing and having its top and bottom edges movable in close proximity to said arcuate portions.

4. The combination, with a casing having an inclined floor and upper and lower arcuate portions near its outer end, of a door of approximately semicircular cross-section journaled in the side walls of said casing and swinging in vertical direction, the upper and lower edges only of said door moving in close proximity to said arcuate portions of the casing.

5. The combination, with a vertically-



swinging door, of stop-levers which are depressed by each outgoing barrel and returned by said door to their initial position.

6. The combination, with a vertically-swinging door, of stop-levers which are depressed by each outgoing barrel, and automatically returned to their initial position by said door when the latter returns to its initial or normal position.

7. The combination, with a vertically-swinging door, counterweighted to maintain it normally in a predetermined position, of stop-levers in advance of said door, and means carried by said door to operate said levers when said door is returned to such predetermined position.

8. The combination, with a vertically-swinging door counterweighted to maintain it normally in a predetermined position, of stop-levers in advance of said door and arranged to be depressed by the outgoing barrel, and means carried by said door, and operating during the return movement of the latter, to simultaneously raise all of said levers.

9. In a door for cold-storage rooms, the combination, with a casing having an inclined floor and upper and lower arcuate portions, of a door having its top and bottom edges movable in close proximity to said arcuate portions and arranged to swing upwardly, weights for returning said door to its normal position, and pivoted stop-levers in advance of the door, said levers being rockable in one direction by the barrel and in the other direction by said door when the latter returns to its normal position.

10. The combination, with a casing having an inclined floor, of a vertically-swinging door journaled in the side walls of said casing, said door being counterbalanced to maintain it normally in a predetermined position, and stop-levers operating in the floor of said casing and rockable by said door.

11. The combination, with a casing having

an inclined floor, of a vertically-swinging door journaled in the side walls of said casing, said door being counterbalanced to maintain it normally in a predetermined position, a shaft extending transversely to said casing and arranged beneath the floor thereof, stop-levers mounted on said shaft and operating in slots in said floor, a shaft-operating lever carried by said shaft, and means carried by the door for engaging and rocking said shaft-operating lever when said door returns to its normal position.

12. The combination, with a casing having an inclined floor, of a vertically-swinging door journaled in the side walls of said casing, said door being counterbalanced to maintain it normally in a predetermined position, a shaft extending transversely to said casing and arranged beneath the floor thereof, stop-levers mounted on said shaft and operating in slots in said floor, a shaft-operating lever carried by said shaft, and an arm on said door to engage and raise said shaft-operating lever.

13. In a door for cold-storage rooms, the combination, with the casing A having the inclined floor *b*, of the vertically-swinging door B journaled in said casing, the weights *w* carried by said door, the arm *h'* pivoted to the lower portion of said door, the shaft *f<sup>2</sup>* extending transversely to said casing below the floor thereof, the stop-levers *f* operating in slots *f'* in said floor, the actuating-lever *g* mounted on said shaft *f<sup>2</sup>* and disposed in the path of said arm *h'*, and the spring *k* engaging the door at one edge and limiting the movement thereof, as described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

JOHN F. DRUCKER.

Witnesses:

PAUL GOEPEL,  
H. E. ROCKWELL.