No. 714,619. Patented Nov. 25, 1902.

S. P. STEVENSON.

CHUTE AND AUTOMATICALLY OPENING OR CLOSING DOOR FOR AIR TIGHT CHAMBERS.

(Application filed Oct. 14, 1901.)

(No Model.)

Fig. 1.

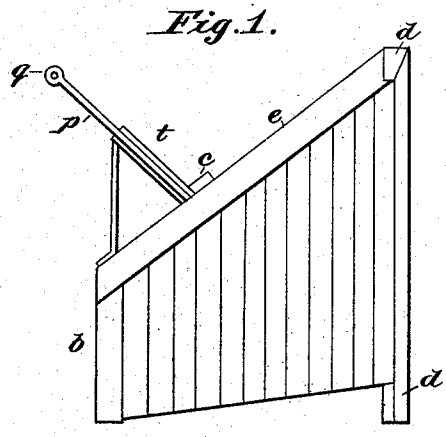


Fig. 2.

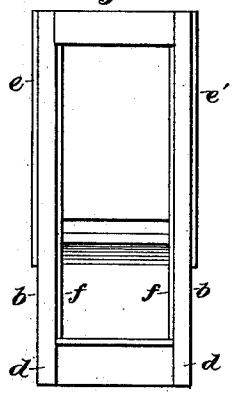


Fig. 3.

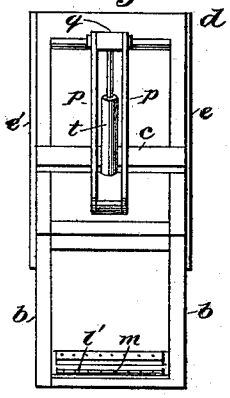


Fig. 4.

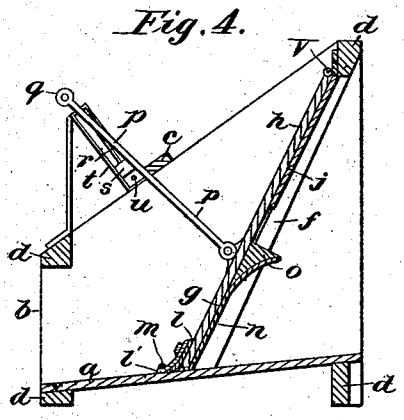


Fig. 5.

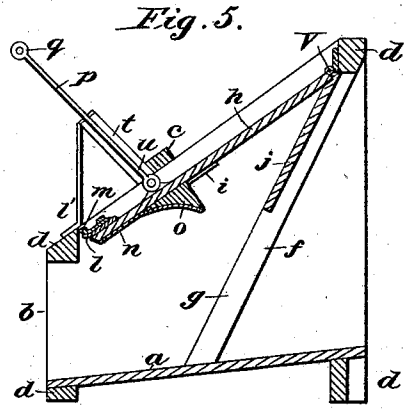


Fig. 7.

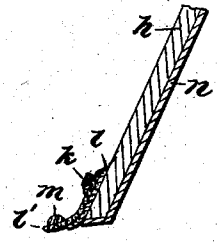


Fig. 6.

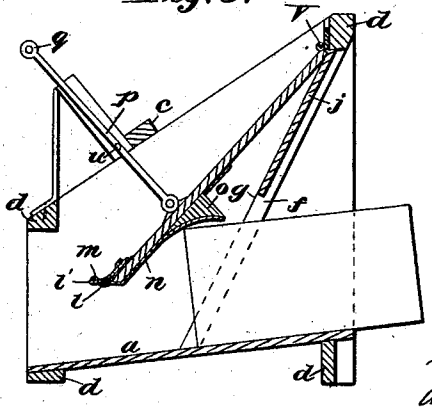
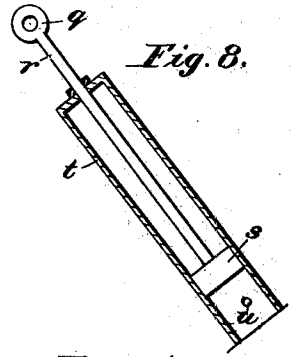


Fig. 8.



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CHUTE AND AUTOMATICALLY OPENING OR CLOSING DOOR FOR AIR-TIGHT CHAMBERS.

SPECIFICATION forming part of Letters Patent No. 714,619, dated November 25, 1902.

Application filed October 14, 1901. Serial No. 78,593. (No model.)

To all whom it may concern:

Be it known that I, S. PRICE STEVENSON, a citizen of the United States, residing at the city of Chester, in the county of Delaware and State of Pennsylvania, have invented a certain new and useful Chute and Automatically Opening or Closing Door for Air-Tight Chambers, Especially Adapted to Use for Ice-Storage Chambers, of which the following is a specification.

The nature of my invention consists in an inclined chute having a door opened by the descending load passing through it and closing automatically by gravitation as soon as the load has passed; and to this end it consists of a chute having an inclined bottom, a door hinged in said chute in inclined position when closed, and means of regulating the opening and closing of the door, as hereinafter described, and shown in the accompanying drawings, in which—

Figure 1 shows a side elevation of my invention; Fig. 2, a front elevation thereof; Fig. 3, a rear elevation thereof; Fig. 4, a central vertical lengthwise section thereof in closed position; Fig. 5, a like section in open position; Fig. 6, a like section in a half-open position, with a block of ice passing through it. Fig. 7 is a sectional enlarged view of the lower end of the door and packing, and Fig. 8 is an enlarged sectional view of the dash-pot.

Referring to the drawings, *a* represents the inclined floor or bottom of the chute, the angle of inclination of which should be sufficient to let a block of ice slide downwardly without pushing it.

b b are vertical parallel sides of the chute extending upwardly at the end near the entrance of the chute to a height considerably above that of the delivery end of the chute, and *c* is a cross-brace for supporting a dash-pot. Both ends of the chute are open, and the whole structure is supported and braced by a framework *d* and casings *e* and *e'*. Fastened on the inner sides of the sides *b b* are oblique strips or casings *f f*, which form shoulders or rabbets *g g*, against which the door *h* closes.

The door *h* is of such length or height as to largely exceed the greatest height to which it is required to be opened, and is attached by hinges at the upper end to the frame *d*, and is provided with a gasket or packing *i* on the under sides near the edges, which packing contacts with shoulders or rabbets *g g* on the strips *f f*.

A casing *j*, resting upon strips *f f*, closes the upper part of the chute, leaving an opening below of sufficient height to pass a block of ice. The strips *f f*, with their upper surfaces or shoulders *g g*, and the casing *j* are all in the same diagonal plane and form a valve-seat, against which the door *h* closes, acting as a valve, and the sides *b b* of the chute being parallel and close to the edges of the door restrict the flow of air-currents through the chute at the sides of the door *h*, so that when the door *h* is opened by the passing of a block of ice a minimum flow of air is permitted to pass through the chute.

The upper side of the casing *j* is in the same plane as the shoulders *g g* on the strips *f f*, and the packing or gasket *i* extends across the door, so as to contact with the casing *j* when the door is closed.

The proportion of the door in height or length from the opening below the casing *j* to the point of suspension of the hinges on the frame *d* are such that the ice on entering contacts with the door approximately at or below the center of gravity of the door. On the under side of the door is fastened a concave block *o*, against which the ice strikes obliquely and avoids or moderates the shock of sudden contact in opening the door *h*.

The under surface and end of the door *h* is covered by a metallic plate *n* to protect it from wear.

To the lower end of the door *h* there is attached a packing of felt, formed of two or more layers *l* and *l'*, secured by a batten *k*, attached to the door *h*. The second layer of felt *l'* is longer than the first and has a strip of wood *m* attached to its upper side, which by its weight closes the end of the felt *l'* into contact with the floor.

To the middle of the door *h* on the upper side thereof are pivotally attached links *p p*, the upper ends of which are pivotally connected to a cross-head *c* on a piston-rod *t*, attached to a piston *s*, working in a cylinder *t*, having an opening *u* at the bottom of contracted dimensions, which acts as a dash-pot

in restraining the door *h* from undue concussion against the strips *f f*.

The operation of the invention is as follows: A cake of ice being introduced to it contacts obliquely with the upper foremost corner in the concavity in block *o* and sliding in contact therewith gradually opens the door *h* by raising it, as shown in Fig. 6, and passing under the end of the door *h* leaves the door free to close by its weight at a velocity controlled by the escape of air from the dash-pot *t*.

The arrangement of proportioning the door so that the ice makes contact and imparts opening motion to the door at or below the center of gravity avoids destructive stress upon the hinges and distributes the force on the whole door.

By imparting the opening motion to the door *h* by means of the concave block *o* and restraining the closing action of the door *h* by the dash-pot *t* shocks are avoided, and the whole structure including the packings have a great durability and certainty of action, and the chute being but little longer than the cake of ice passing through it and the sides extending above the door in the highest open position a minimum volume of air passes through the chute with the ice.

Having described my invention, what I claim is—

1. In a chute and door for air-tight chambers, an inclined bottom, a hinged inclined door provided with a concave surface to receive opening motion, and a connected air piston and cylinder, arranged to retard the closing motion of the door as set forth.

2. In a chute and door for air-tight chambers an inclined bottomed chute having parallel sides embracing the door in opened and closed positions, diagonal casings therein attached to the sides and an inclined door working between said sides, in combination with packings attached to said door arranged to contact with said casings in closed position as set forth.

3. In a chute and door for air-tight chambers, a chute having an inclined bottom and parallel sides with diagonal casings attached thereto, an oblique door hinged to work between said sides and to close on said casings, in combination with a packing of flexible material attached to the lower end of said door and a strip attached to said packing to enforce contact of the packing with the bottom of the chute as set forth.

4. In a chute for air-tight chambers, a chute having an inclined bottom and parallel sides having oblique shoulders within said sides, adapted to contact with a corresponding oblique door, in combination with a door fitted to work in open and closed positions between said parallel sides and hinged from the upper part of the chute so as to present for contact in opening motion a point approximately at or below the center of gravity of the door substantially as set forth.

5. In a chute and door for air-tight chambers, a chute-frame and an inclined door hinged at the upper end to said frame, in combination with a chute having parallel sides extending above said door in its highest open position and fitting closely to the sides of said door as set forth and described.

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