No. 812,377. PATENTED FEB. 13, 1906.

S. P. STEVENSON.

DOOR FRAME, DOOR, AND ADJUNCTIVE MECHANISM FOR AIR TIGHT COMPARTMENTS.

APPLICATION FILED JULY 24, 1901.

2 SHEETS—SHEET 1.

Fig. 1.

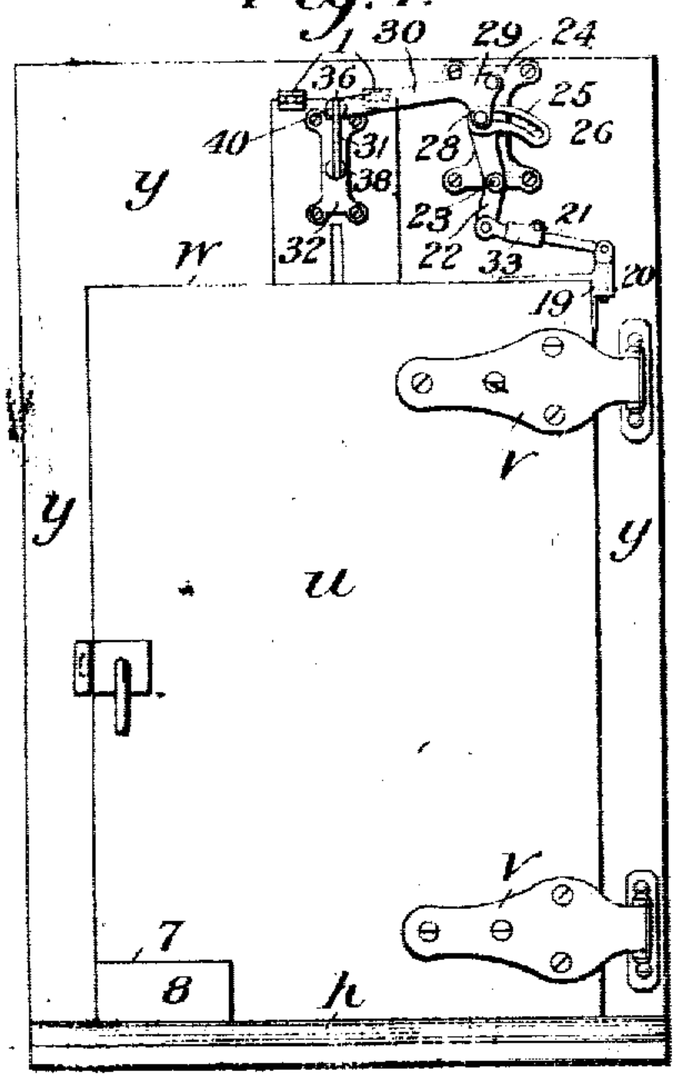


Fig. 2.

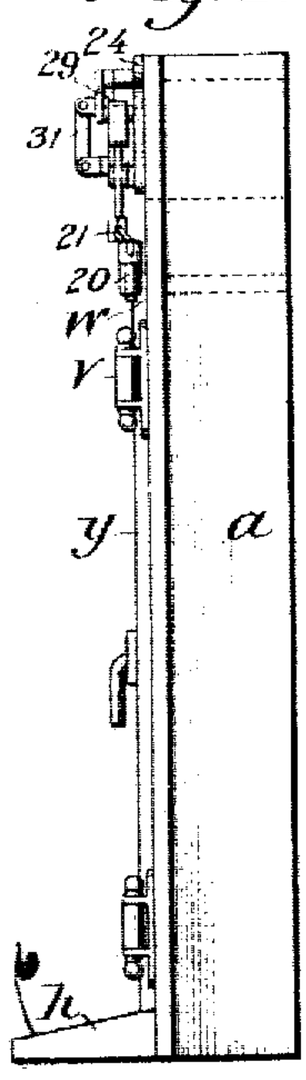


Fig. 3.

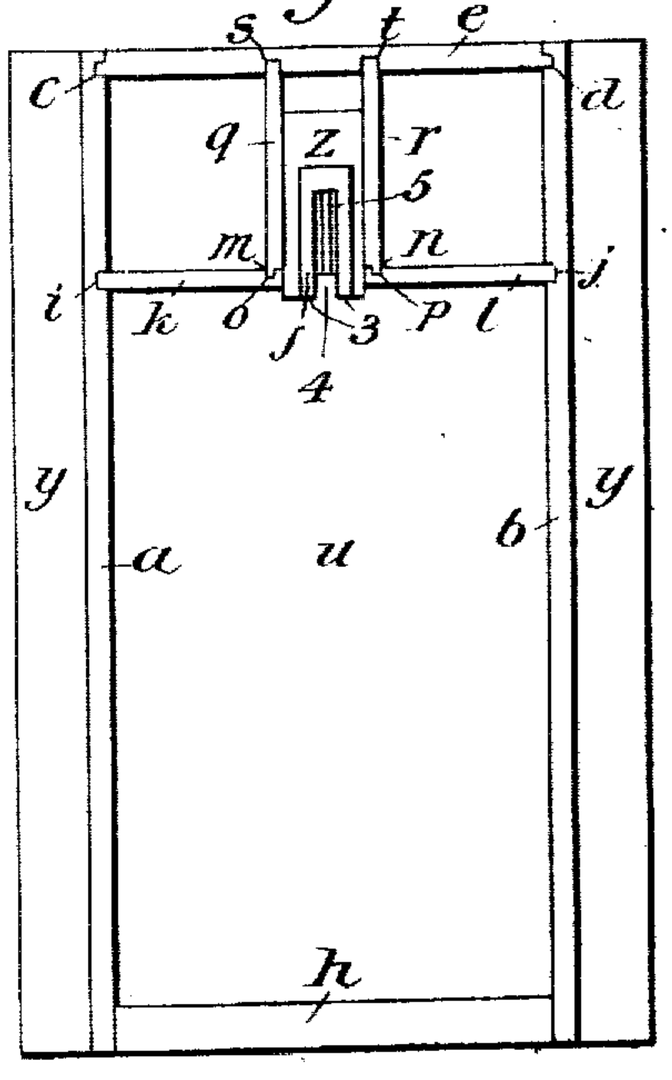


Fig. 4.

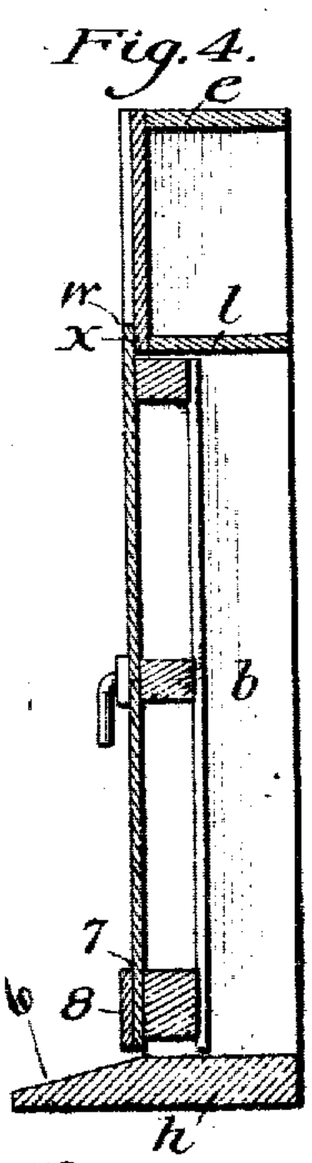


Fig. 5.

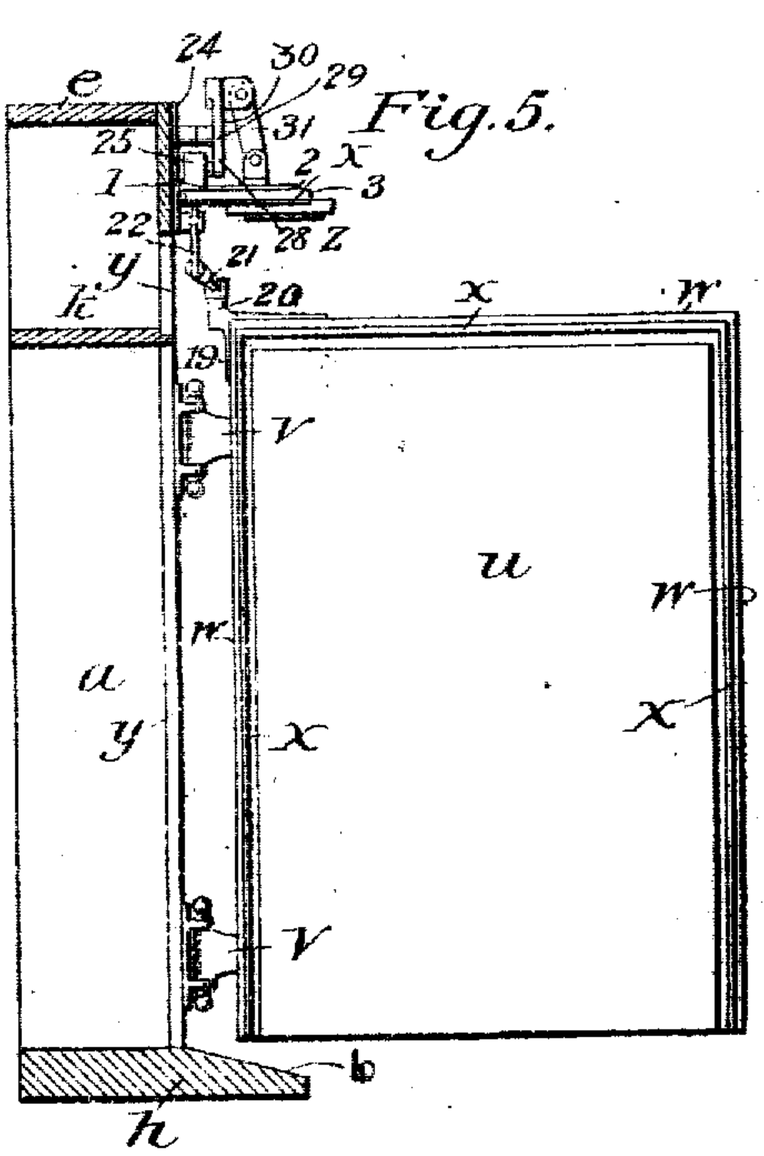
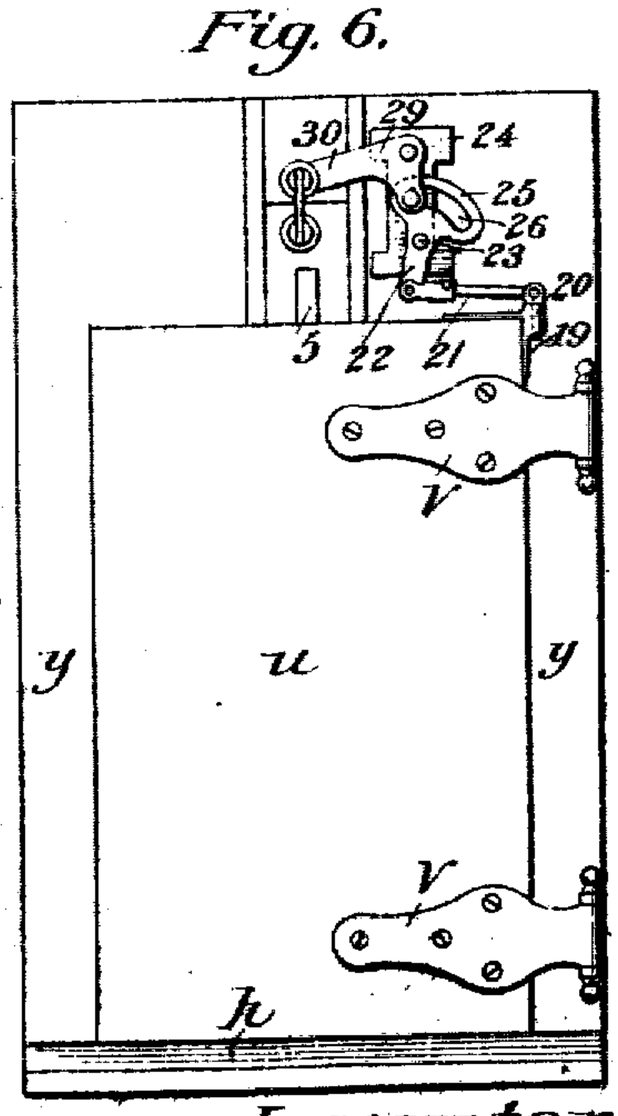


Fig. 6.



Witnesses:
Philip A. Wittler
John L. Hayden

Inventor:
S. Price Stevenson
by Lloyd Wiegand
Atty

No. 812,377. PATENTED FEB. 13, 1906.

S. P. STEVENSON.

DOOR FRAME, DOOR, AND ADJUNCTIVE MECHANISM FOR AIR TIGHT COMPARTMENTS.

APPLICATION FILED JULY 24, 1901.

2 SHEETS—SHEET 2.

Fig. 8.

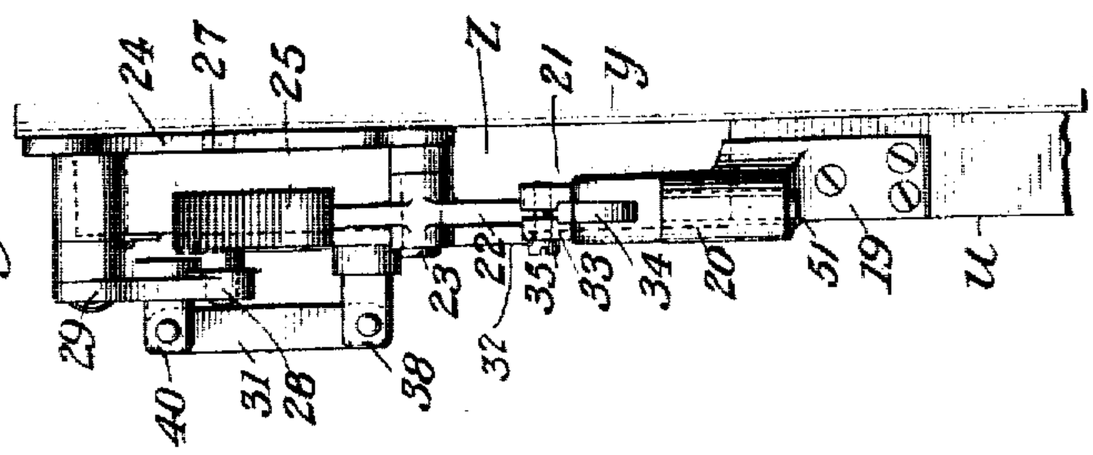


Fig. 11.

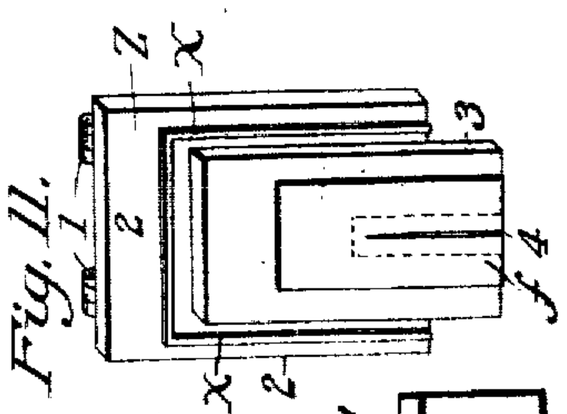


Fig. 10.

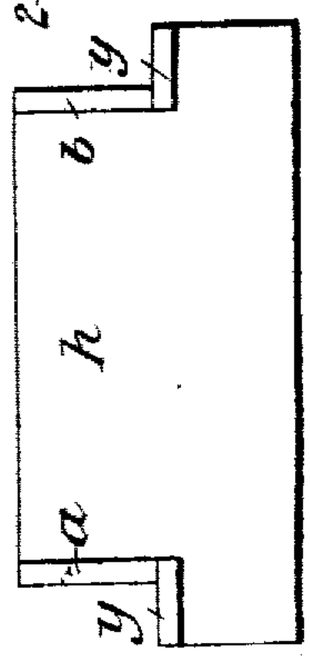


Fig. 7.

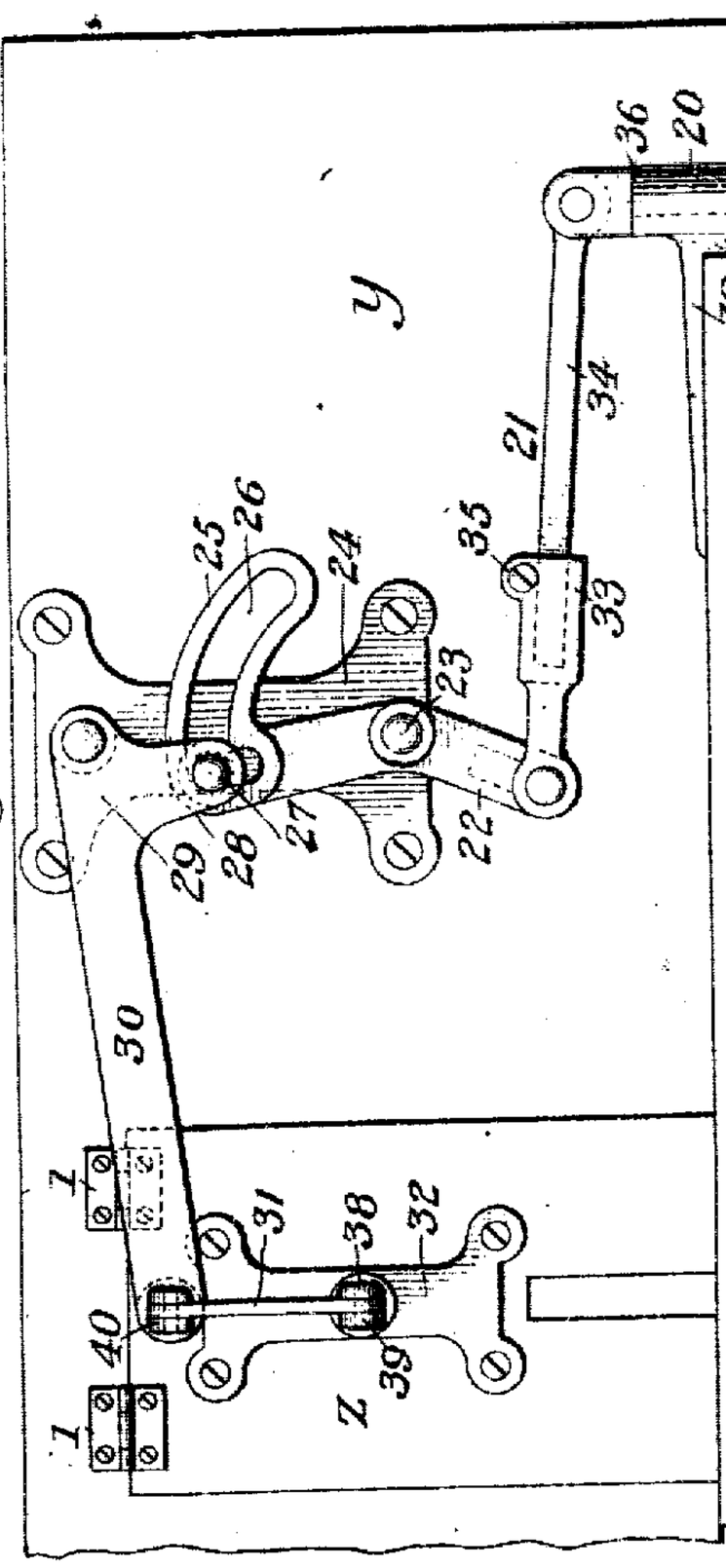
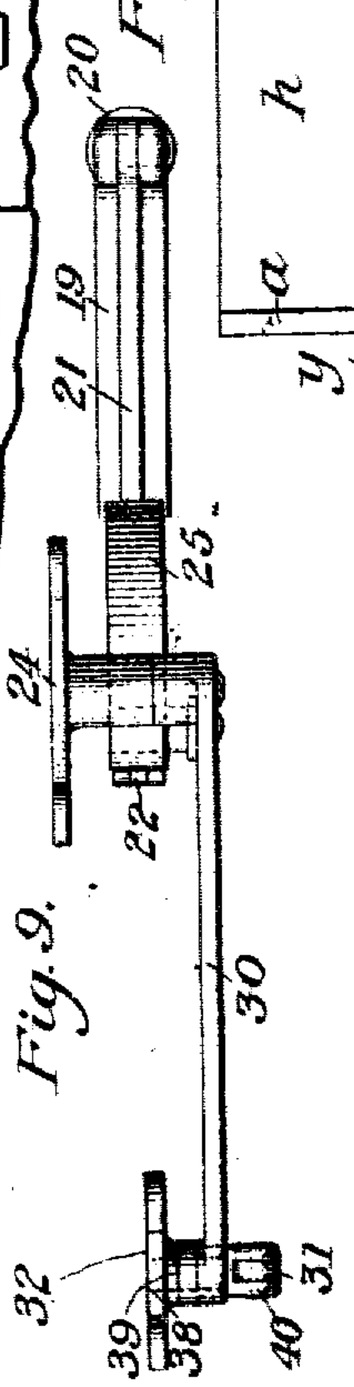


Fig. 9.



Witnesses:
Philip. A. Ettheider
John L. Snyder

Inventor:
S. Rice Stevenson
by Lloyd Wiegand
atty

UNITED STATES PATENT OFFICE.

S. PRICE STEVENSON, OF CHESTER, PENNSYLVANIA.

DOOR-FRAME, DOOR, AND ADJUNCTIVE MECHANISM FOR AIR-TIGHT COMPARTMENTS.

No. 812,377. Specification of Letters Patent. Patented Feb. 13, 1906.

Application filed July 24, 1901. Serial No. 69,575.

To all whom it may concern:

Be it known that I, S. PRICE STEVENSON, a citizen of the United States, residing at Chester, in the county of Delaware and State of Pennsylvania, have invented new and useful Improvements in Door-Frames, Doors, and Adjunctive Mechanism for Air-Tight Compartments, of which the following is a specification.

This invention relates to doors for air-tight apartments, and more particularly to those used for cold-storage apartments, and has for its object the facility of entrance and exit from such apartments with the least duration of opening of the door and the facility of introducing and removing objects by a trolley and suspended railway with a prompt opening and air-tight closing of the door and facility of adjusting the door-frame to any imperfections in the form of the door.

To this end this invention consists in an improved construction of adjustable door-frame and doors fitting thereto and to the suspended rail and positively-connected means of opening said doors and closing them, as hereinafter described, and shown in the accompanying drawings, in which—

Figure 1 shows a front elevation of a door-frame and door in closed position embodying this invention. Fig. 2 shows a side elevation thereof. Fig. 3 shows a rear elevation thereof. Fig. 4 shows a vertical section thereof in closed position; Fig. 5, a vertical section thereof in open position. Fig. 6 shows a modified form in front elevation. Fig. 7 shows an enlarged front view of the mechanism for operating the upper door; Fig. 8, a side elevation thereof; Fig. 9, a plan view thereof. Fig. 10 is an inverted plan of the door-frame sill, and Fig. 11 an enlarged perspective rear view of the upper door.

Referring to the drawings, *a* and *b* represent the jambs of the door-frame, the upper ends of which are grooved at the inner sides, receiving the tongues *c* and *d* on the ends of the lintel *e*, and the lower ends of the jambs *a* and *b* extend downwardly below the upper surface of the sill *h* and are secured to the sill *h* by nailing them. The sill or threshold *h* extends laterally beyond the door-opening in front of the lower ends of the casings *y*, which are attached thereto, and thus strengthened, so as to support the fulcrums of extended hinges, (shown in Figs. 5 and 6,) such as are described and claimed in my Letters Patent No. 647,586, dated April 17, 1900, and shown in my Letters Patent No. 697,689, dated April 15, 1902.

In the jambs *a* and *b* are cut grooves *i* and *j*, into which are fitted blocks *k* and *l*, extending inwardly to within a short distance from the center of the doorway and having their front edges flush with those of the jambs *a* and *b*. Grooves *m* and *n* are cut in the upper sides of the block *k* and *l*, into which are fitted tongues *o* and *p*, formed on blocks *q* and *r*, the upper ends of which are fitted in grooves *s* and *t*, cut in the under side of the lintel *e*. The front faces or edges of the blocks *k* and *l* and *q* and *r* are flush or in the same plane with the front edges of the jambs *a* and *b* and of the lintel *e*. Casings *y* sufficiently thin to be torsionally flexible (or susceptible of being twisted out of a flat plane to conform to any deviations from flat plane in the door) are secured to the front edges of the jambs *a* and *b*, the lintel *e*, blocks *k* and *l* and *q* and *r* of the frame, and to the sill *h*. A door *u*, with overlapping edges *w*, is hung by extended hinges *v* from the front casing *y*, the edge *w* resting against the front of the casing *y* when closed, and sealed by a gasket *x*, interposed between the overlapping edge *w* and the front of the casings *y*, attached to the front of the frame.

A small door or shutter *z* is hung by hinges 1 on its upper edge from the casing *y* and has overlapping edges 2 on the upper edge and sides, which when closed rest upon the casing *y*. The shutter *z* has also a projecting lip 3 upon the inner side, which rests against the inner side of the door *u* when closed, being thus held in closed position by the door *u*. The edges 2 are fitted with gasket *x*, similar to that on the door *u*, extending across the door *z*. The door *z* is provided with a slit or cleft 4, which fits loosely over the suspended rail 5. This slit is covered with a piece of felt *f* or other fabric, extending down to the gasket *x* on the door *u*, having an opening through it to fit the rail 5, and with a scissor-cut extending downward to its lower end. The inner margin of the cleft 4 in the door *z* is rounded out, so that the felt opens to pass over the rail, closing over it practically air-tight and leaving no appreciable leak at any point.

The front casings *y* extend downwardly below the upper surface of the sill *h*, which sill *h* extends forwardly from the door and is beveled downwardly for a portion of its thickness, as shown in the part marked 6 in the drawings. This construction of sill or thresh-

old is adapted to be let into the floor, so that the door-frame when erected is held securely at the lower end by the floor and presents no abrupt break in the floor to obstruct the passage or cause jolting of wheeled trucks or other vehicles, such jolting being very damaging when occurring to crates of eggs in entering or leaving cold-storage apartments, and, further, it avoids the thin and perishable edge incident to sills or thresholds as usually constructed and fastened upon the surface of the floor. The thickness of the sill in the doorway above the level of the floor in front thereof provides an elevated surface for contact with the packing, which seals the lower end of the door when closed and allows the packing to clear the floor in the open position of the door. The lower corner 7 of the door *u* is strengthened by cleat 8, secured thereto to protect it from injury by collision with trucks entering or leaving the doorway.

The door *u* is preferably hung from the casing *y* and jamb *b* by hinges such as are described and claimed in my Letters Patent No. 647,586, dated April 17, 1900, and described and shown in my Letters Patent No. 697,689, dated April 15, 1902.

The small door or shutter *z* is connected with and operated by the door *u* by a mechanism consisting of levers and links constructed as follows: A bracket 19 is secured to the upper part of the door *u* and has a projecting arm 20, to which is pivotally attached a link 21. The opposite end of the link 21 is pivotally attached to a lever-arm 22, turning upon a pivot 23, supported by a plate or bearing 24, secured to the casing *y*. Attached to or formed with the lever-arm 22 is a slotted cam 25, in the slot 26 of which a roller 27 is engaged. The roller 27 is pivotally attached to the arm 28 of an angle-lever 29, pivotally supported from the plate 24. The other arm 30 of the lever 29 is pivotally connected with a link 31, the opposite end of which link is pivotally secured to a plate 32, attached to the door *z*. The link 21 is made of two parts 33 and 34, the part 33 fitting over the part 34 and is slotted upon one side, so as to be contractible, and is secured adjustably on the part 34 by means of a clamping-screw 35. In order to avoid the torsional strains upon the links 21 and 31, due to the axes of their pivots being in different planes, the pivot connecting the link 21 with the arm 20 is formed in a sleeve 36, having a vertical pivot 51 fitted to turn in the arm 20, and the pivot connecting the link 31 with the plate 32 is similarly formed with a pivot 38, fitted to turn in a bearing 39 in the plate 32, and a like construction is provided at the end of the lever-arm 30 consisting of a pivot 40 having its axis at right angles to the upper pivot of the link 31. The slot 26 in the cam 25 is made in radial form from the pivot 23 through a sufficient part of its length to operate the roller 27 and connected lever 28 and to impart a sufficient motion to open the door *z* during a movement of the door *u* through an arc of thirty degrees. The remaining part of the slot 26 is in a circumferential direction, so that the door *z* is only operated at such time relatively to the door *u* as to always close the door *z* before the upper part of the door *u* contacts with the lower end or lip 3 of the door *z* and to move the door *u* clear of the door *z* before the upper door *z* commences to open.

By making the door-frame with the lintel tongued and grooved into the jambs I am enabled to twist the frame into adjustment so as to fit the plane of the door when the door is warped or sprung without opening the joints, and by using flexible casings I am enabled to make this adjustment without detaching the casings.

By extending the casings below the upper surface of the sill I clamp them securely, so as to strengthen them in their attachment to the door-frame and materially brace them to sustain the strain of the hinges attached to the casing.

By attaching the hinges to the casing instead of to the jambs of the door-frame the door is always held in proper adjustment to the casing and the doors and frames as fitted to each other at the factory remain in adjustment ready for erection and use.

Having described my invention, what I claim is—

1. The combination of a door for an air-tight apartment; a door-frame having a port above the door-opening proper and adapted to permit the passage of a rail with a free space between its track and the upper portion of said port; a shutter hinged to the door-frame above said port, said shutter having a vertical slot extending from its lower edge throughout a portion of its height, whereby said shutter may be swung downward to close the interspace between said port and the top and sides of said rail, substantially as set forth.

2. The combination of a door for an air-tight apartment; a door-frame comprising jambs *a*, and *b*, a lintel *e*, blocks *k*, *l*, *r*, and *q*, a casing *y*, provided with a port which is adapted to permit the passage of a rail above said door with a free space between said track and the upper portion of said port; a shutter hinged to the door-frame above said port and provided with a slot extending vertically from its lower edge throughout a portion of its height, whereby said shutter may be swung downward to close the interspace between said port and the top and sides of said rail, substantially as set forth.

3. The combination of a door for an air-tight apartment; a door-frame therefor provided with a port arranged above the door-opening, and adapted to permit the passage of a rail with a free space between its track

and the upper portion of said port; a shutter hinged to the door-frame above said port and having a vertical slot extending from its lower edge throughout a portion of its height, the lower margin of said shutter extending downward below the bottom of said port and into the opening for the door, but substantially flush with the face of the door-frame, whereby said shutter can be swung downwardly to close the interspace between said port and the sides and top of the rail, and the door proper can be closed upon the lower margin of said shutter, substantially as set forth.

4. A door for an air-tight apartment; a door-frame having a port adapted to permit the passage of a suspended rail with a free space between the track thereof and the top of said port; a shutter hinged to the door-frame above said port and adapted to close the opening about the top and sides of said rail; and actuating mechanism, substantially as set forth, operatively connecting said shutter with said door, whereby the shutter is positively opened and closed by the movement of the door in opening and closing.

5. In a door and door-frame for air-tight apartments a port for a suspended rail-track, and a shutter fitted to close said port, in combination with a positive means of opening and closing said shutter from the motion of the door, and arranged to close shutter before closing the door and to open the door before opening the shutter as and for the purpose set forth.

6. In a mechanism for operating a shutter and door for closing the doorway of air-tight apartments, a cam connected to and receiving motion from the opening and closing of the door, and having a slot therein engaging a roller connected with said shutter, said slot having such configuration as to impart motion to the shutter during a portion of the motion of the door and hold the shutter in fixed position during another portion of such motion as set forth.

7. In a door-frame and door for air-tight apartments, a port for a suspended rail-track and a shutter fitted to open and close said port, in combination with a mechanism connecting said shutter with said door arranged to open said shutter as soon as the door has opened sufficiently to clear said shutter and to hold said shutter open during the further opening of the door substantially as set forth.

8. In a refrigerating apparatus, the combination of a housing having a door adapted to close an entrance, and an opening above the door, plates adapted to cover said opening, a lever, connections between said plates and the said lever, a means for actuating the lever and thereby opening or closing said plates simultaneous with the opening or closing of the door.

S. PRICE STEVENSON.

Witnesses:
C. R. MORGAN,
S. LLOYD WIEGAND.