

No. 647,930.

Patented Apr. 24, 1900.

V. ARSCHAULOFF.

WATER TIGHT VERTICALLY SLIDING DOOR.

(Application filed Dec. 6, 1899.)

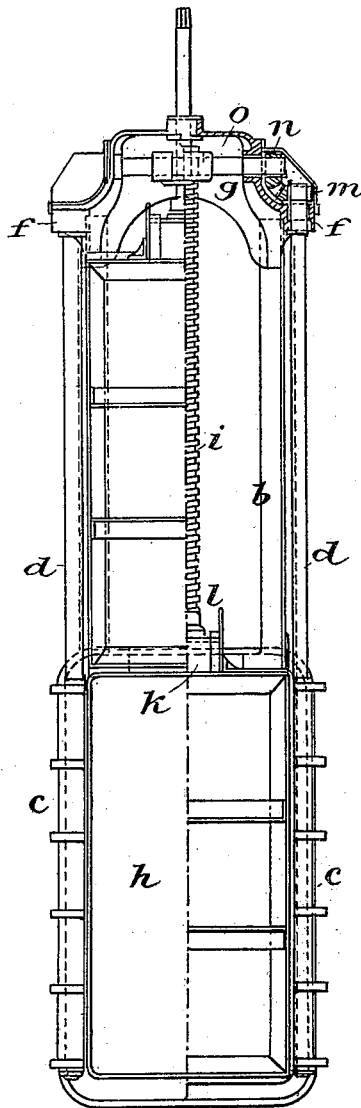
(No Model.)

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Fig. 2.

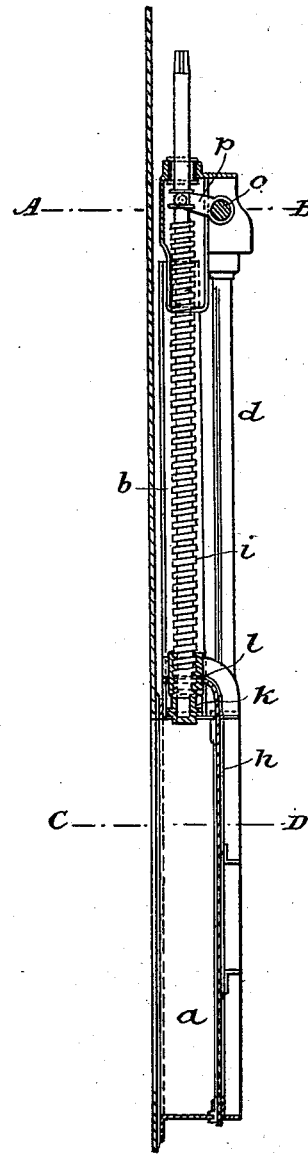
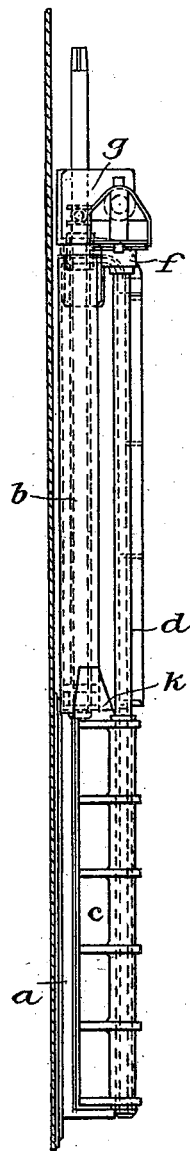
Fig. 1.

Fig. 3.



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Fig. 4.

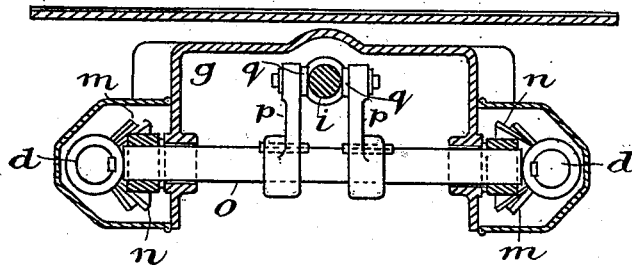


Fig. 5.

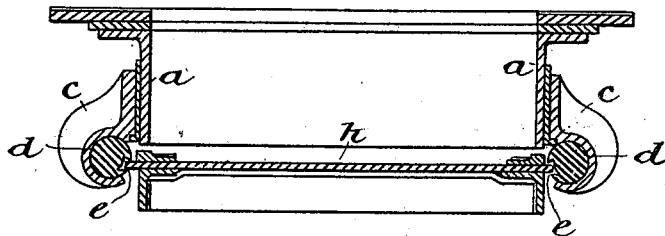
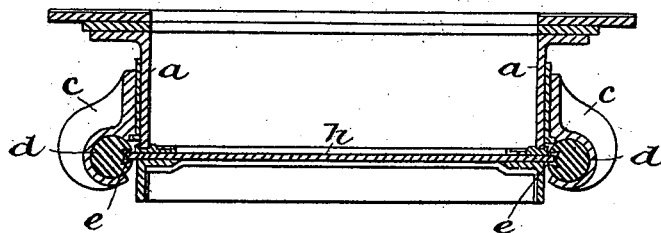


Fig. 6.



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VADIM ARSCHAOULOFF, OF ST. PETERSBURG, RUSSIA.

WATER-TIGHT VERTICALLY-SLIDING DOOR.

SPECIFICATION forming part of Letters Patent No. 647,930, dated April 24, 1900.

Application filed December 6, 1899. Serial No. 739,433. (No model.)

To all whom it may concern:

Be it known that I, VADIM ARSCHAOULOFF, a subject of the Emperor of Russia, and a resident of St. Petersburg, Russia, have invented certain new and useful Improvements in Water-Tight Vertically-Sliding Doors, of which the following is a specification.

The water-tight vertically-sliding doors known up to this time are generally of such a character that the tightening of the joint depends upon a careful fitting of the contact-surfaces of the door and of its fixed frame. Such fitting constitutes a very delicate work, the efficiency of which can be injured by the least lesion of the fitted surfaces and even by the least warping of the bulkhead to which the door-frame is secured. If a more simple and effective system of tightening the doors is applied, consisting in a rubber packing-strip, the closing mechanism becomes considerably more complicated, because by the sliding-down motion of the door this latter must be maintained at a certain distance from the contact-surface of the fixed frame to avoid the flaying and damaging of the packing-strip. Only when the door has reached the limit of its stroke can it be firmly pressed against the fixed frame; but the working conditions of such water-tight doors require that their mechanism should be as simple as possible.

The object of the present invention is to attain this purpose; and it consists of a limited number of parts, which are combined together positively and require for their actuating only a uniform working of a crank-handle or the like, which causes at first the door to slide downward, and when this latter has reached a determined position it is firmly pressed against the fixed frame in an automatic manner.

Figure 1 of the accompanying drawings represents a front elevational view of the improved door, the left-hand part of the figure showing the door in a raised or open position and the right-hand side in a lowered or closed position; Fig. 2, a side elevation of the door, the bulkhead being cut on a vertical plane; Fig. 3, a vertical axial section of the door; Fig. 4, a horizontal cross-section, on a larger scale, on line A B, Fig. 3. Figs. 5 and 6 are sectional views, on a larger scale, of the door

and contiguous parts, Fig. 5 showing the door partly closed and Fig. 6 showing the same fully closed.

The fixed frame *a*, constructed of angle-irons, is secured to the bulkhead. Above this frame two standards or guides *b b* of a similar cross-section are secured. To the outer sides of the frame *a* two vertical tubular sleeves *c c* are secured, having on their inner sides a longitudinal slot, Figs. 5 and 6. In these sleeves vertical shafts *d d* are fitted, having each a longitudinal groove *e*. The upper ends of these shafts are journaled in sleeves *f f* of a cross-box *g*, secured to the standards *b b* and serving as a casing for the actuating device. The door slides with its side edges in the grooves *e e* of the vertical shafts *d d*, which serve to guide them. The downward and upward sliding movements are imparted to the door *h* by a vertical worm or screw *i*, whose lower end is journaled in a step-bearing *k*, secured on the upper cross-beam of the fixed frame *a*. The upper end of the screw is journaled in a sleeve of the cross-box *g*. The screw *i* is actuated directly or by means of any suitable transmission device.

The upper edge of the door *h* is bent inwardly and forms a fork, embracing a square nut *l*, through which passes the screw *i* in such a manner that the rotation of this latter causes the nut *l*, and with it the door *h*, to rise or to descend in accordance with the direction of rotation of the screw.

On the upper extremities of the vertical shafts *d d* toothed conical sectors *m m* are secured, gearing with similar sectors *n n*, fixed on a horizontal shaft *o*, journaled in the cross-box *g*. About the middle of this shaft two arms or levers *p p* are secured, having trunnions *q q* inserted into their free extremities. These trunnions are engaged between two collars or shoulders of the screw *i*.

During the upward or downward motion of the door the screw *i* bears upon the bottom of the step *k* and the arms *p p* remain inclined downwardly and maintain, by the aid of sectors *n n*, engaging with the sectors *m m*, the vertical shafts *d d* in such a position that their longitudinal grooves *e e* and therewith the web of the door remain at a certain distance from the external rib of the fixed frame

a, Fig. 5; but as soon as by the rotation of
 the screw *i* the door will descend to the po-
 sition in which the nut *l* will sit down upon
 the step *k*, the movement of the screw *i* be-
 5 ing continued in the same direction, it begins
 to unscrew itself and rise up, while its col-
 lars will lift up the trunnions *q q*, which causes
 the levers *p p* to be pivoted upwardly and
 turn the horizontal shaft *o*. This latter trans-
 10 mits the motion, by means of toothed sectors
n n and *m m*, to the vertical shafts *d d*, so
 that their grooves *e e*, together with the door
h itself, will approach to the fixed frame *a*,
 thus causing the rubber packing to be firmly
 15 compressed between the door *h* and its fixed
 frame *a*, Fig. 6. Thus a rotation of the screw
i in one direction will cause the door to slide
 down and to be pressed firmly against the
 fixed frame. When the screw is driven in an
 20 opposite direction, the door begins first to
 move away from the fixed frame and then to
 slide upwardly.

I claim as my invention—

1. The combination, with a vertical sliding
 25 water-tight door, of two vertical rotative
 shafts, provided with longitudinal channels,
 or grooves, in which the edges of the door
 slide, the latter being raised or lowered by
 means of a screw and nut, located in the up-

per bent part of the door, this nut bearing in 30
 the lowest position of the door upon the box
 or any other stop, thus forcing the screw,
 which continues to rotate in the same direc-
 tion, to rise and to impart to the vertical
 shafts, by means of a suitable transmission, 35
 a rotation, by which grooves of these shafts
 cause the door to be pressed against the fixed
 frame and to secure a water-tight joint, sub-
 stantially as described and shown.

2. In combination, a door, movable guides 40
 therefor, a screw adapted to be rotated, and
 means operated by said screw for succes-
 sively moving the door vertically and mov-
 ing the guides to move said door transversely
 and vice versa, substantially as described. 45

3. In combination, a door, rotatable shafts
 having guides for said door, a screw adapted
 to move said door vertically, and means op-
 erated from said screw for rotating said shafts
 when the door is opposite the door-opening, 50
 substantially as described.

In witness whereof I have hereunto set my
 hand in presence of two witnesses.

VADIM ARSCHAOULOFF.

Witnesses:

N. TSCHÉVOLOFF,
 J. BLAU.