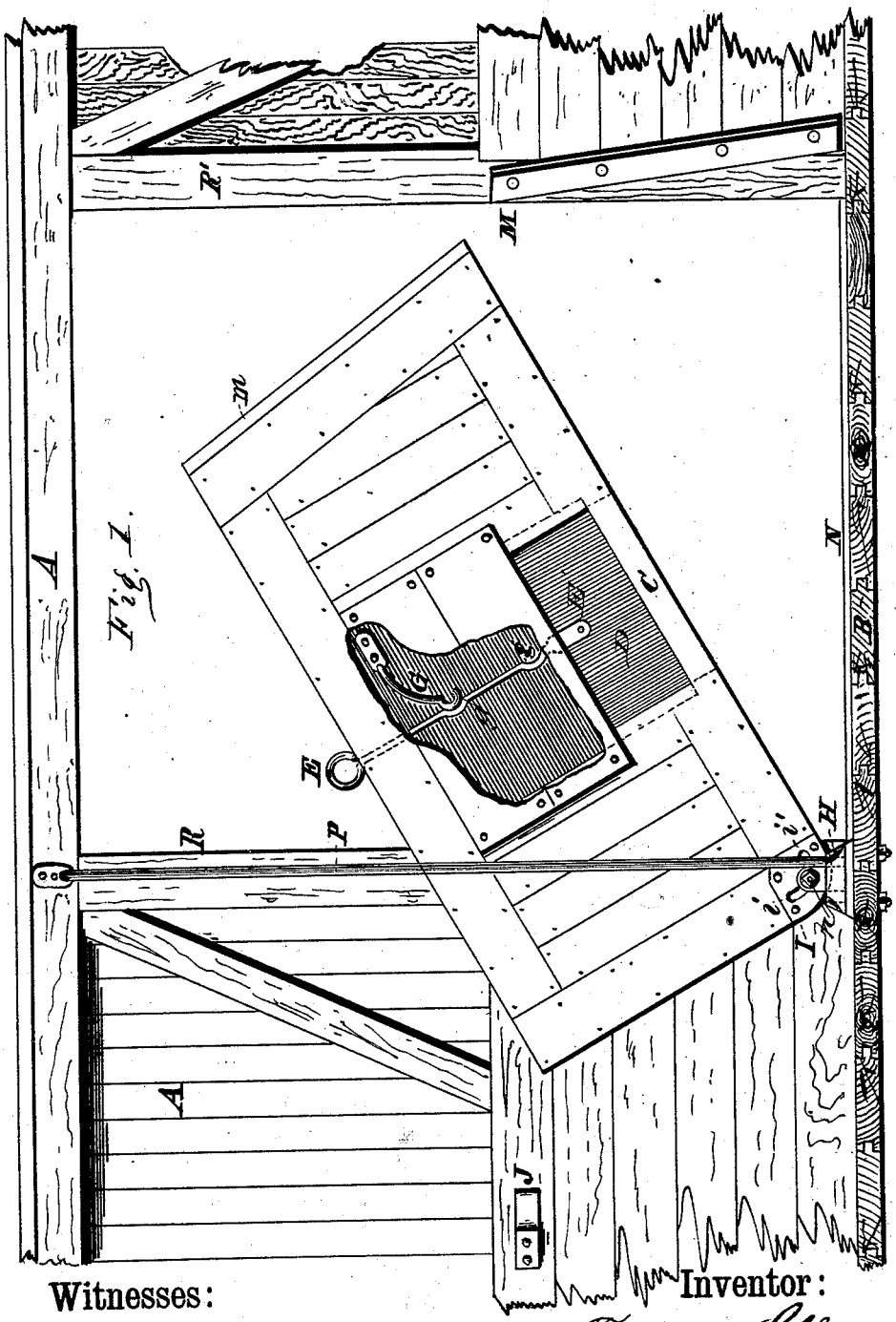
3 Sheets—Sheet 1.

T. SILLS.

Grain-Door.

No. 216,580. Patented June 17, 1879.



Witnesses:

Michael J. Stark

Frank Hirsch

Inventor:

Thomas Sills,

by Michael J. Stark

Attorney.

3 Sheets—Sheet 2.

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Grain-Door.

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FIG. 3.

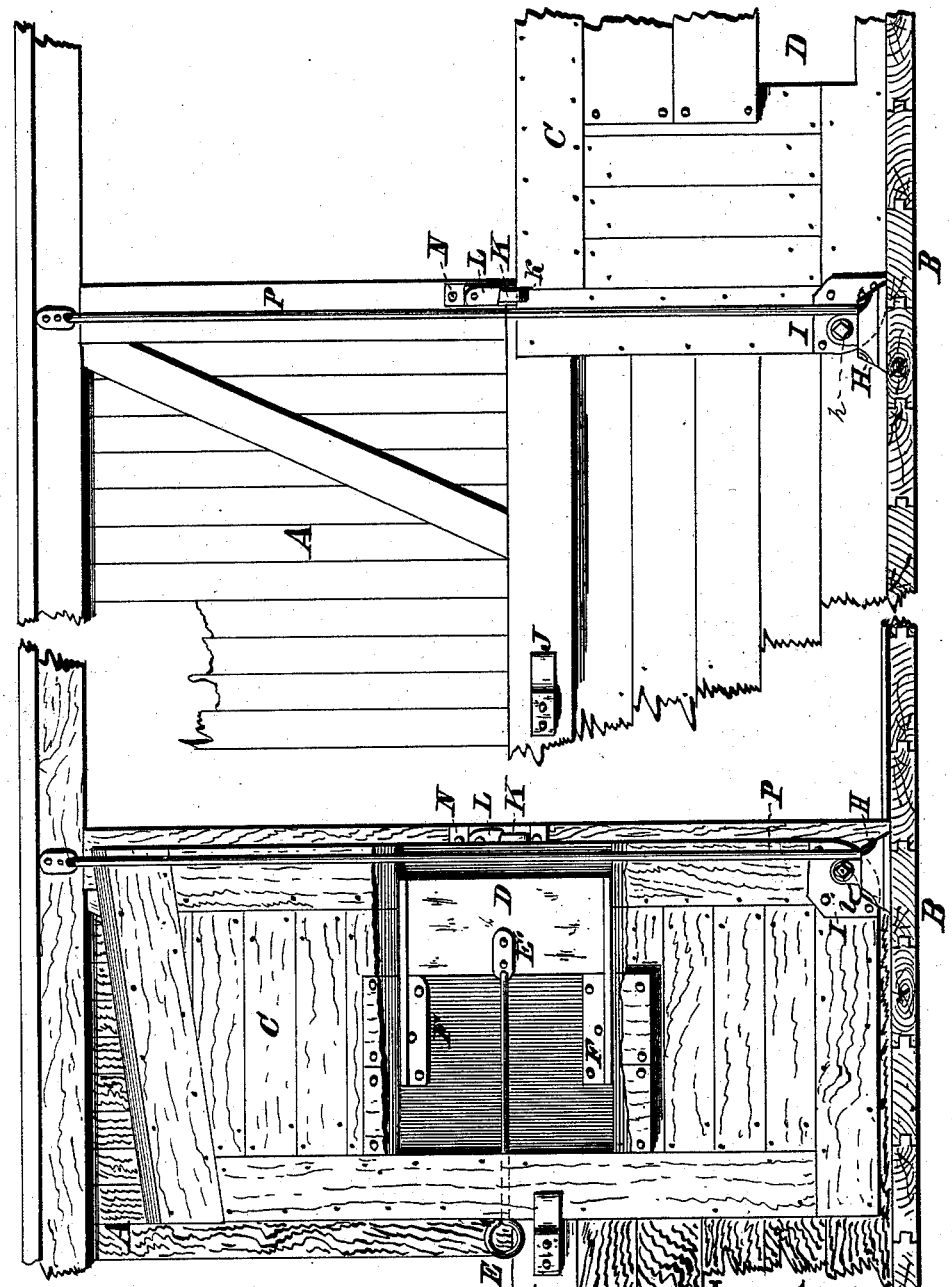

FIG. 2.

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3 Sheets—Sheet 3.

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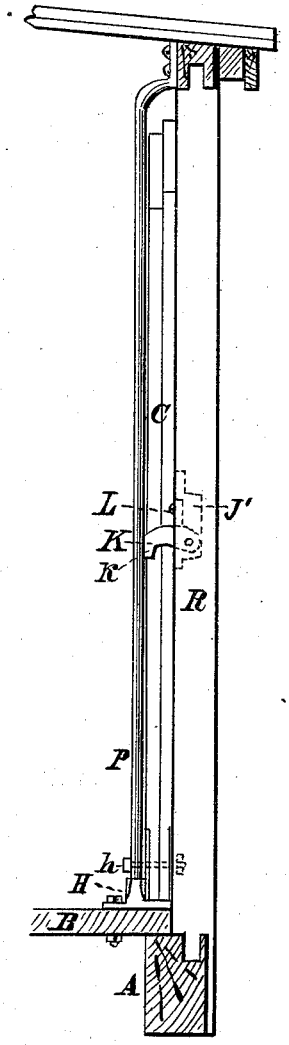


FIG 4.

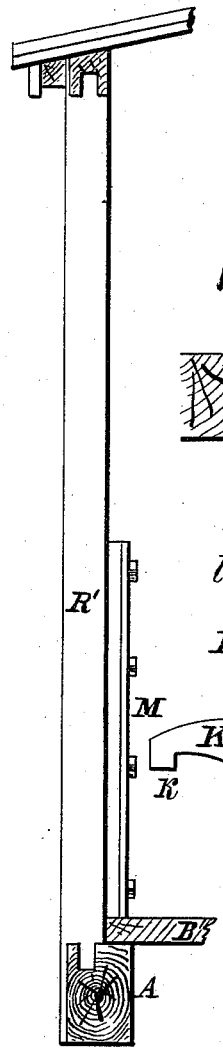


FIG. 5.

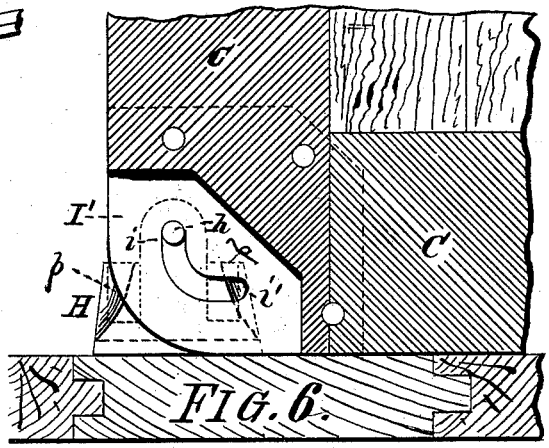


FIG. 6.

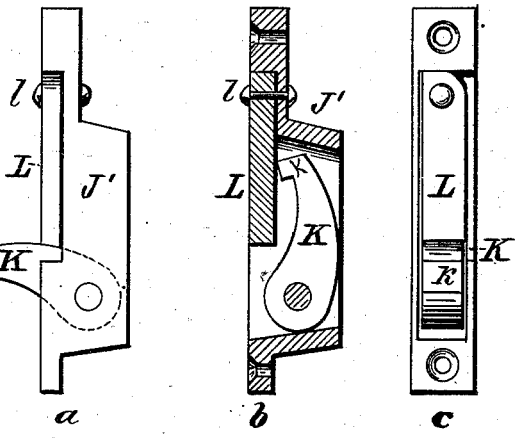


FIG. 7.

Fig. 8.

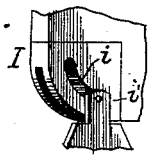
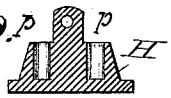


Fig. 9.



Witnesses:

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Frank Hirsch

Inventor:

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by Michael J. Stark,

Attorney.

UNITED STATES PATENT OFFICE.

THOMAS SILLS, OF FORT ERIE, CANADA, ASSIGNOR OF ONE-HALF HIS RIGHT TO JAMES R. PETRIE, OF BUFFALO, NEW YORK.

IMPROVEMENT IN GRAIN-DOORS.

Specification forming part of Letters Patent No. **216,580**, dated June 17, 1879; application filed December 31, 1878.

To all whom it may concern:

Be it known that I, THOMAS SILLS, of Fort Erie, in the county of Welland and Dominion of Canada, have invented certain new and useful Improvements on a Grain-Door; and I do hereby declare that the following description of my said invention, taken in connection with the accompanying sheets of drawings, forms a full, clear, and exact specification, which will enable others skilled in the art to which it appertains to make and use the same.

This invention has general reference to grain-doors for railway-cars, &c.; and it consists in the novel construction and arrangement of parts, as hereinafter first fully set forth and described, and then pointed out in the claims.

In the drawings hereinbefore mentioned, which serve to illustrate my said invention more fully, Figure 1 is a front elevation of a portion of a car seen from the interior thereof, and showing my grain-door partially open. Fig. 2 is a similar view of the same entirely open, and Fig. 3 is a like view illustrating a portion of the door closed. Figs. 4 and 5 are sectional elevations through the center of the doorway. Fig. 6 is a sectional elevation of a fragment of the lower left-hand corner of the door seen from the interior. Fig. 7, *a* is an elevation; *b*, a sectional elevation, and *c* a face view of the lock. Fig. 8 is a perspective view of the corner-piece, and Fig. 9 a sectional view of the support.

Like parts are designated by corresponding letters of reference in all the figures.

A is the framing of a railway freight, express, or other car, &c., of which B is the bottom, and R R′ the upright posts on the sides of the door-opening. C is a door having centrally near the lower part an aperture closed by a sluice, D, placed within guides F in said door, and operated by a hand-rod, E, secured to said sluice at E′ in any convenient manner. This hand-rod has two notches, *g*, at suitable places, wherewith engages a spring, G, in such manner that it will either uphold the sluice when opened or retain the same in position when closed. This door is pivoted on one corner (the lower left-hand corner when seen from the inside of the car, by preference) to a support, H, by means of a bolt, *h*, passing through a curved slot-hole, *i i′*, in a corner-piece, I, secured to said door. The front edge of this door is rabbeted at *m* and engages with a guard, M, secured to the upright R′ of the car-framing. The support H has two sockets, *p*, Fig. 6, wherein is placed a guide-rod, P, extending to the roofing of the car-body, said support having two sockets, so as to enable it to be used on either the right or left side of a door. Within the upright R is placed a lock, (shown in detail in Fig. 7, *a*, *b*, and *c*,) consisting of the housing J′, the pivoted catch-hook K, having the nose *k*, and the pivoted latch L.

The operation of this door is substantially as follows: Supposing a car is to be unloaded, the sluice D is first opened to allow as much of the grain to flow from the car as will discharge of its own accord. After disengaging the lock the door is pushed upward, which, on account of the curved slot-hole *i i′*, will cause, also, a lateral motion of said door sufficient to cause the inclined rabbeted part *m* to withdraw from the guard N. Now the door may be readily swung entirely open and brought to a stop against the stop J. In this position the catch-hook K will readily fall out of its housing J′, so as to hold the door in a vertical position, the guard-rod P assisting in this, while the pivoted latch L, also dropping of its own accord, locks the hook. In this manner the door is securely held in proper position, so that the car may now be emptied in the usual manner.

One of the principal advantages of this door is that it can never be removed from the car, and is thereby not liable to be lost or damaged, and is thus also ever ready to serve its designated purpose.

To close the door, it is swung downward until the rabbeted projection *m* has effected engagement with the guard M, the curved slot-hole *i i′* causing a reverse movement of the door from that already described, while the hook K is again brought in action to hold the door securely to the upright R, the nose K engaging with the face of the door to draw it tightly to the framing, while the latch L, engaging the hook K, prevents an upward movement of said door.

To prevent any accumulation of grain within the slot-hole *i i′*, which would interfere with the proper operation thereof, I have slot-

ted the proper corner of said door, as shown in Figs. 6 and 8, so that when the door is lifted the accumulated grain will escape through said slot-hole.

For a similar purpose I have also slotted that part of the door C into which the gate or sluice D passes when being closed, as illustrated in Fig. 2.

It will be observed that the front edge of the grain-door C is inclined, said door being shorter on its top edge than on its bottom edge, and that the guard M is placed onto the car-framing in a corresponding manner. This is quite a feature in my device, inasmuch as by it the front part of the door is locked in position in conjunction with the curved slot-hole *i i'*, while the rear part thereof is locked by the catch-hook K and latch L.

This locking of the front edge is accomplished in the following manner: The door, when being closed, slides downward on that corner having the slot-hole *i'*, and moves forward sufficiently to engage the guard M. Now, any pressure or force applied on the forward or inclined end of said door has a tendency to wedge the inclined part tighter into the said guard, owing to its being inclined, so that the front part of the door cannot be opened until the rear part is first raised, and, by the curved slot *i i'*, the door caused to move laterally and withdrawn sufficiently from the guard M to afford a free passage of said front end.

During shipment of grain, the catch-hook K and latch L being in position, the rear end of the door is locked; and since that end must be raised first before the front end is unlocked, it is evident that unlocking of the door by accident is an impossibility, and that, therefore, said locking devices form an effectual safeguard against loss of grain, merchandise, &c., caused by an accidental opening of said door.

It will be further observed that the catch-hook K, in conjunction with the latch L, locks the rear end of the door when in a horizontal or closed position. This device also locks the door in position when standing vertically, inasmuch as in that case the bottom edge passes beyond said catch-hook and allows it to drop out of its housing, thereby placing an obstruction in the way of the door, which prevents its being closed until said obstruction is first removed by swinging the catch-hook upward into the housing J'. This locking of the door when in an erect position is clearly shown in Figs. 2 and 4, while that of locking the door in a horizontal position is illustrated in Fig. 3.

Having thus fully described my invention, I claim as new and desire to secure to me by Letters Patent of the United States—

1. A grain-door arranged to swing upon a pivot at one corner within a curved slot-hole, and having its front edge inclined and arranged to engage a fixed inclined guard, substantially as and for the purpose specified.

2. A grain-door arranged to swing upon a pivot at one corner within a curved slot-hole, and having its front edge inclined and arranged to engage a fixed inclined guard on the car-frame, said door being arranged to swing in a vertical plane, and having a locking device, substantially as described, on its rear end, whereby both ends of said door are locked when in a closed or horizontal position, substantially as and for the use and purpose specified.

3. In a grain-door pivoted at one corner and arranged to swing in a vertical plane, the combination, with said door, of the corner-piece having the curved slot-hole and the guard M, said door being provided with a sluice, whereby part of the matter to be discharged from the car is withdrawn through said sluice to facilitate the opening of said door, substantially as and for the object stated.

4. The combination, with the door C, having the corner-casting I, provided with the curved slot-hole *i i'*, of the support H, having the bolt *h*, and the double sockets *p*, for the reception of the guard-rod P, as and for the object stated.

5. The combination, with the door C, having its front edge inclined and rabbeted at *m*, and provided with the corner-piece I, having the curved slot-hole *i i'*, of the support H and the guard M, as stated.

6. The combination, with the door C, having its front edge inclined and rabbeted at *m*, and provided with the corner-piece I, having the curved slot-hole *i i'*, of the support H, the guards M and P, and the stop J, as and for the object stated.

7. The door C, having the slotted corner-piece I, as specified, said door being grooved or slotted at I', to allow the passage of grain accumulating within said curved slot, as specified.

8. The reversible support H, having the sockets *p*, for the reception of the guard-rod P, and an eye for the bolt *h*, as stated.

9. The combination, in a grain, &c., car, with a door arranged to swing from a horizontal to a vertical position, of a lock having the pivoted hook K, as described, and the tumbler L, arranged to engage the hook K, to prevent it from moving upward, said lock being arranged to engage the upper margin of the door when closed and the lower bottom edge when the door is open, as shown and described.

10. The combination, in a grain, &c., car, with a door having a sluice, of the hand-rod E, having the notches *g*, and the spring G, as and for the purpose described.

In testimony that I claim the foregoing as my invention I have hereto set my hand and affixed my seal in the presence of two subscribing witnesses.

THOMAS SILLS. [L. S.]

Attest:
MICHAEL J. STARK,
FRANK HIRSCH.