No. 871,659. PATENTED NOV. 19, 1907.

J. E. ABBOTT.

GRAIN DOOR FOR CARS.

APPLICATION FILED SEPT. 20, 1906.

2 SHEETS—SHEET 1.

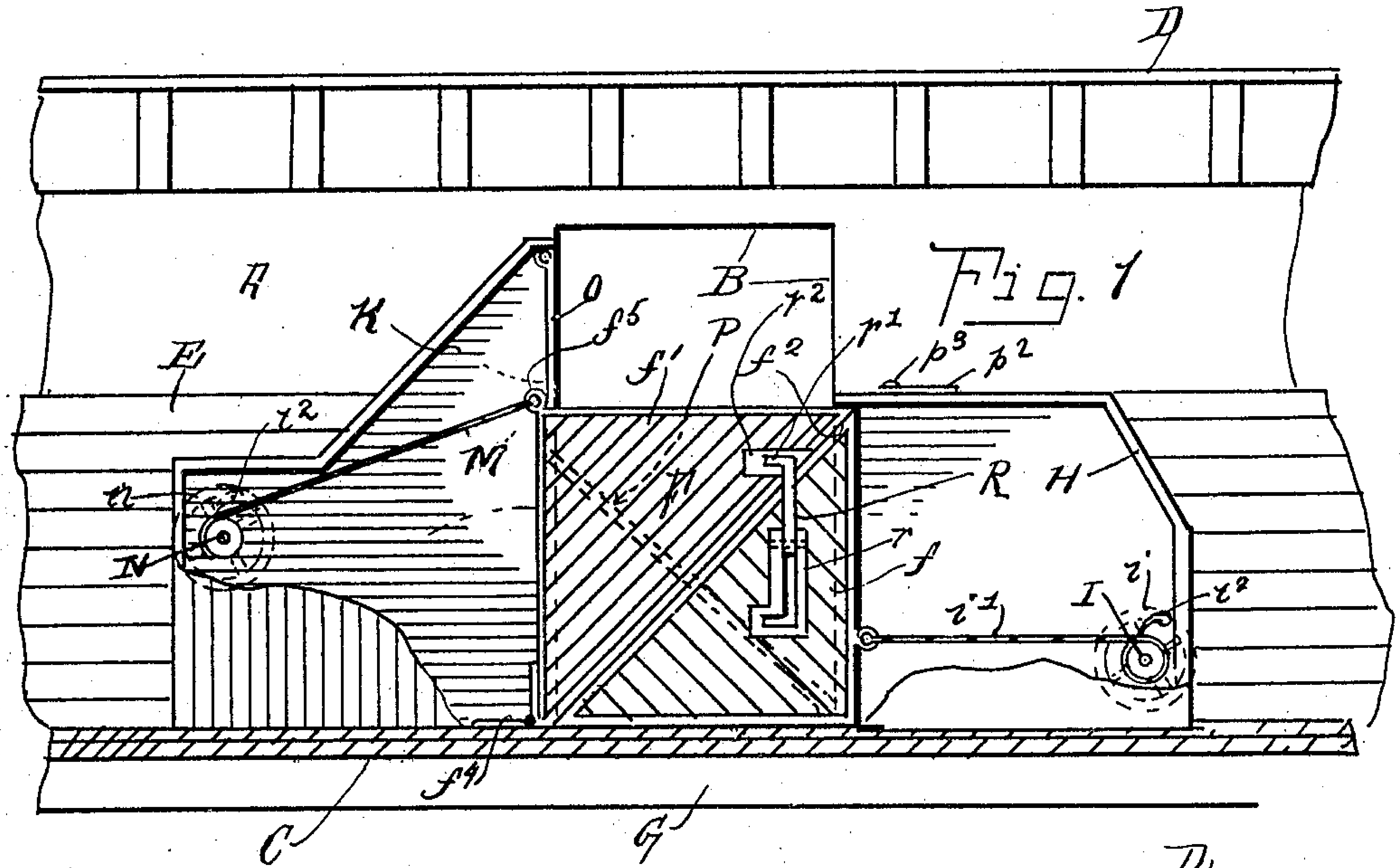

Fig. 1

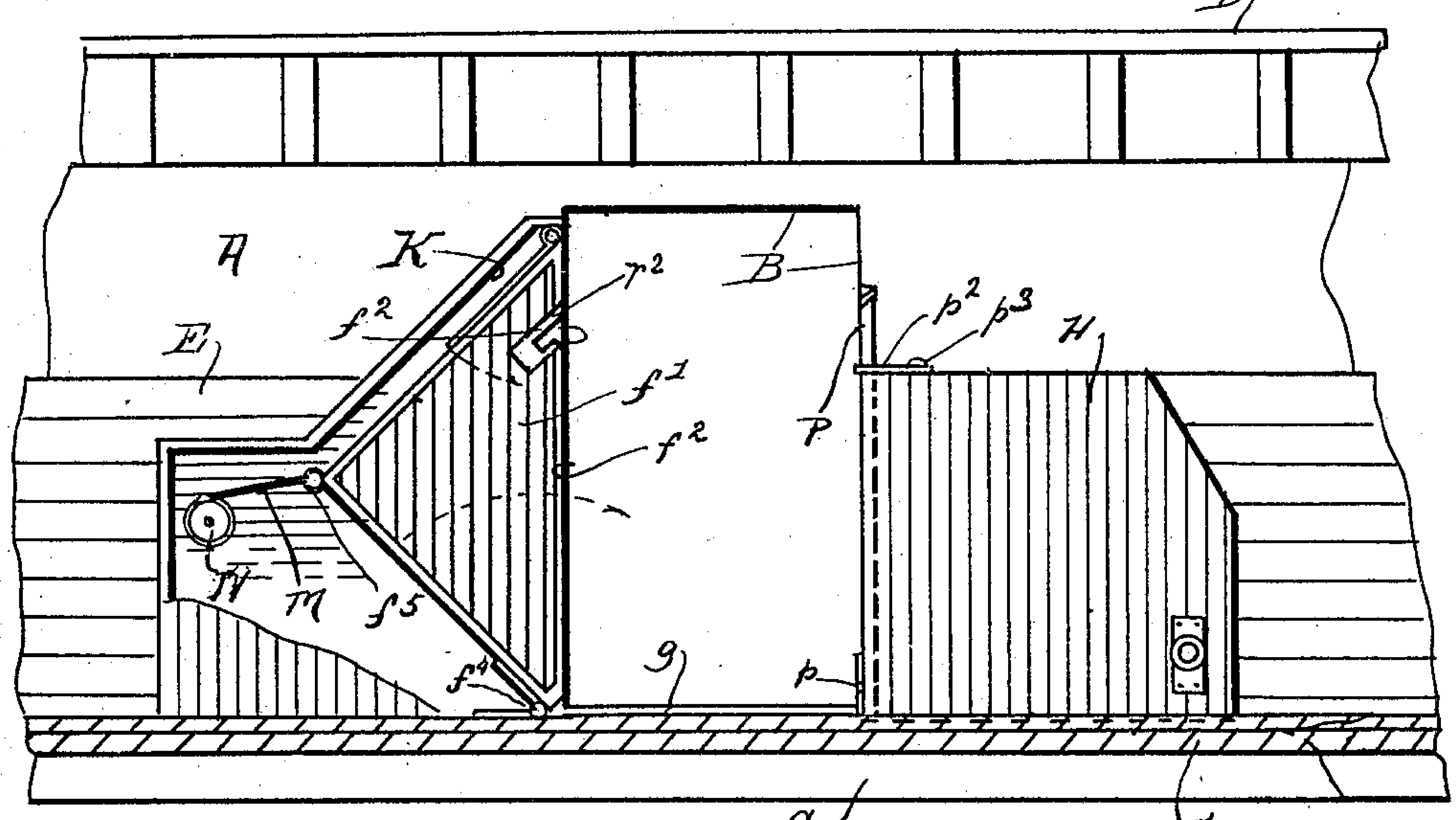

Fig. 2

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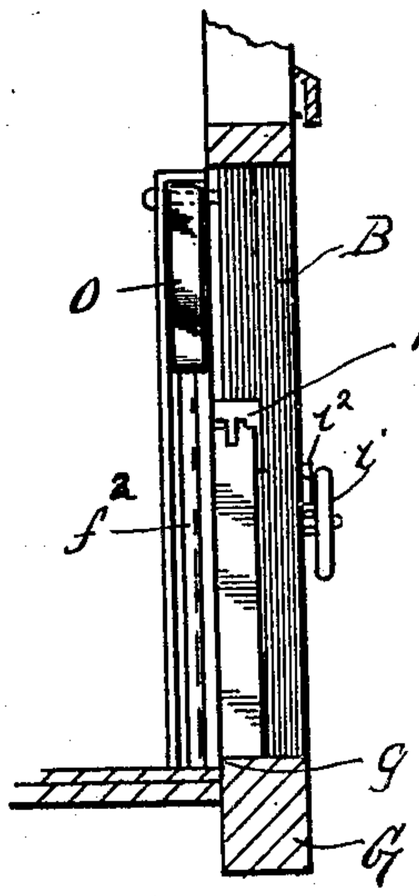

Fig. 3

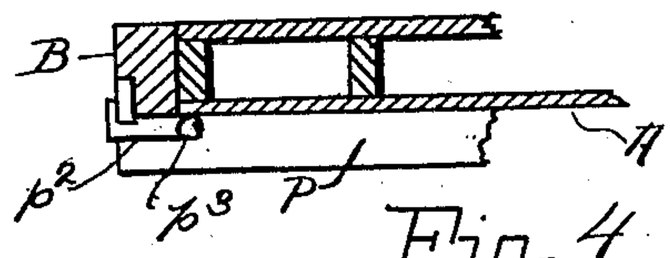

Fig. 4

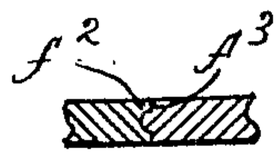

Fig. 5

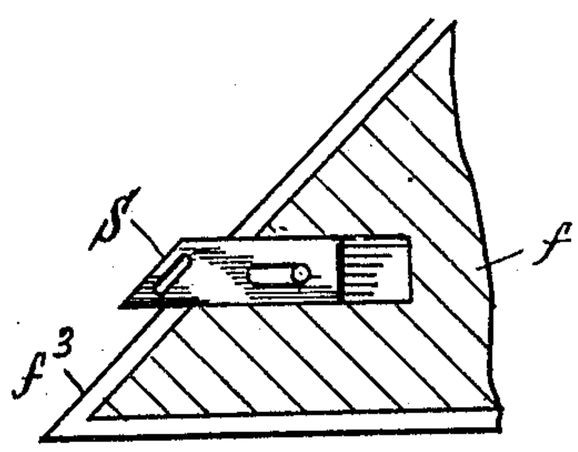

Fig. 6

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UNITED STATES PATENT OFFICE.

JOHN E. ABBOTT, OF PORT HURON, MICHIGAN.

GRAIN-DOOR FOR CARS.

No. 871,659 Specification of Letters Patent. Patented Nov. 19, 1907.

Application filed September 20, 1906. Serial No. 335,471.

To all whom it may concern:

Be it known that I, JOHN E. ABBOTT, a citizen of the United States of America, and a resident of the city of Port Huron, St. Clair county, Michigan, have invented certain new and useful Improvements in Grain-Doors for Cars, of which the following is a full, clear, and exact specification.

In providing inner doors for freight cars which are adapted to seal the lower part of the regular door opening so that the car may be filled to its full capacity with bulk grain, difficulty is met in so disposing the parts that the car may be opened after the cargo has settled against the door from the tremor of the car while being moved, the great side pressure resulting in binding the slide-doors and aprons of the many forms now used so that they can only be started by pounding and jarring them from the outside, often necessitating the use of special battering rams and pinch bars.

The object of this invention is to provide a door which may be opened from outside the car, with a minimum effort, and which is so disposed and arranged that the weight of the settled bulk grain does not bind it.

Another object is to provide a door which can be attached to any car of standard build without changing the details of construction or incurring unusual cost for special materials and construction.

Another object is to provide an absolutely grain-tight door which is securely locked against accidental movement, either shut or open.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claim.

In the drawings, Figure 1 is a view in side elevation of the inner wall of a car with the side door way, fitted with a grain door which embodies the features of the invention, the door being closed, parts being broken away to give clear view. Fig. 2 is a similar view, with the grain door retracted or open. Fig. 3 is a view in elevation of the side of the regular door jamb, showing the upper edge of the lower section of the grain door, and also an apron closing the door pocket. Fig. 4 is a view in detail of a cross-brace, with its retaining latch. Fig. 5 is a view in section, showing the interlocking of the mating margins of the door sections. Fig. 6 is a view in detail of a rabbet latch for the lower section of the grain door.

Referring to the drawings, A represents the inner face of a portion of a box-car wall, with a side door casing B, floor C and roof D, all of any standard construction and material, a smooth, inner skin E for a little more than half the height to fit the car in the usual manner for carrying grain in bulk.

A grain door F is provided, which is adapted to close the door casing B as high as the top of the skin E. This door, when drawn across the casing, or closed, is rectangular in shape and is prevented from being outwardly displaced by the door casing and the ledge *g* formed by the sill G across the door opening. The door comprises a lower section *f*, in form a right angled triangle, resting on one of its sides, and a corresponding upper triangular section f^1, said sections being adapted to close against each other along their oblique margins f^2 and f^3 which thus lie along one of the diagonal axes of the door. The mating margins f^2 and f^3 are tongued and grooved or rabbeted to form a close joint when closed, the preferable construction being the former, with the tongue on the lower section, as herein illustrated. The sections are constructed of metal or the usual matched stuff, with their margins iron-bound.

A suitably proportioned pocket H is formed of wood or sheet metal on the side of the casing, into which the lower section *f* may be retracted by any suitable means, as, for example, a drum I journaled in the car wall and pocket, and rotated by a hand wheel *i* on the outside of the car, said hand wheel lying close against the car wall just beyond the space occupied by the outer slide door, a chain or like flexible connection i^1 connecting the section and drum, and a detent and ratchet or like locking means i^2 being provided to hold the hand wheel against rotation if desired. The upper section f^1 is likewise provided with a pocket K, of suitable proportions and material. Instead of sliding into this pocket, as does the lower section into the other, the lower corner of the upper section is hinged or pivoted as at f^4 to the car floor, a flexible connection M is attached to the upper corner of the section and to a drum N, operated by an outer hand wheel *n* similar to the hand wheel *i*, and the upper section is thus turned up and back until its oblique margin is flush with the door casing and closes the pocket.

Inasmuch as the upper section, when low-

ered across the casing opening, leaves the upper part of the pocket-opening exposed, so that grain might find lodgment there, a swinging apron or shield O of suitable material and proportion is pivoted to hang down and close the opening, its lower end *o* meeting the upper margin of the lower section, and being held from swinging back when the section is closed down, by a suitable stop which may, conveniently, be an eyebolt f^5 to which the connection M is attached. The retraction of the section automatically swings the apron back.

A cross-brace P is secured in the door opening to lie diagonally across the mating margins f^2 and f^3 of the door sections. This comprises a bar of suitable material whose lower end is pivoted or hinged, as at *p*, to the side of the casing, its other end being fitted to interlock with a suitable socket p^1 in the other side of the casing, the bar closing flat in a suitable rabbet in the casing to which it is attached and being locked there by a suitable latch, as for example, a horizontal notched, flat bar p^2 pivoted at its inner end by a bolt or screw p^3 on the top of the pocket H said latch being turned around and interlocking with its notched end with the upper part of the cross-brace. Said cross-brace bears throughout its length against the outer face of both sections when thrown down across the door opening.

To prevent the meeting edges of the sections springing apart, they are locked together by a latch R which is pivoted in a suitable pocket *r* countersunk in the inside of the lower section, so that it does not prevent the retraction of the section into its pocket. The latch is provided with a lug r^1 adapted to interlock with a suitable face plate r^2 countersunk in the upper section. A further convenient detail of construction, is a handpull S which is inserted in the tongued margin f^3 of the lower section *f*, its outer end, when the handpull is pushed back into the pocket or mortise provided, presenting a practically unbroken and flush continuation of the tongue f^3 of said section. Access may be had to the handpull through a notch or recess in the margin of the pocket wall.

When the car is empty, the sections are each folded back or drawn into their respective pockets, and the interior of the car is practically the same as though not provided with the door. When grain is to be loaded, the cross-brace is latched across the casing, the lower section drawn out, and the upper section turned down on it and latched there, the apron falling across the upper part of the pocket opening and closing it against any kernels of grain. The car is then loaded in the usual manner. When it is to be unloaded, the section latch is unlocked, and the upper section is readily turned back by its hand wheel into its pocket, as the bulk of the area exposed to the side thrust of the grain is along the upper strata of the cargo, and so the side pressure is slight. Furthermore, the cross-brace forms a guide which is flush with the pocket wall, and prevents the section springing or warping out of line. After the upper section is released, the pressure against the lower section is relieved, as the grain moves away from it in part, and the cross-brace and sill ledge prevent it from getting out of line.

The chief feature of the invention is the distribution of the area of the two sections so that the side thrust against the first one to be opened is minimized, and thus the grain itself flows away from the second and relieves it in part.

The design of the door is such that it may be made of any materials to match the car to which it is attached, and when once placed, becomes a component part thereof, without interfering with the use of the car for general freight, and without adding to the cost of construction more than do the ordinary inner slide doors or boards provided, which must be usually forced back by battering rams or pinch bars, and are more often broken out than opened without damage.

The minor details of construction may be varied to adapt themselves to any style or standard of good construction and I do not limit myself to any particular form or arrangement of parts, except as set forth in the appended claim.

I claim as my invention:—

The combination with side-wall and door-casing of a box car, of a grain door comprising two right-angled, triangular sections adapted to close together across the door-way along their oblique edges, a pocket for the lower section, means on the outside of the car for drawing the lower section back into said pocket, a pocket for the upper section, means for tilting said upper section on its lower corner back into said pocket, and a cross-brace hinged at its lower end to the floor and side wall extendible across the door-way transverse to the oblique, meeting margins of the two sections, adapted to be folded back flush with the mouth of the lower section pocket, and a swinging apron closing the mouth of the upper section pocket when said upper section is lying within said pocket.

In testimony whereof, I have hereunto set my name in the presence of the subscribing witnesses.

JOHN E. ABBOTT.

Witnesses:
C. RICKILIEU STICKNEY,
HARRY PETTENGILL.