

(No Model.)

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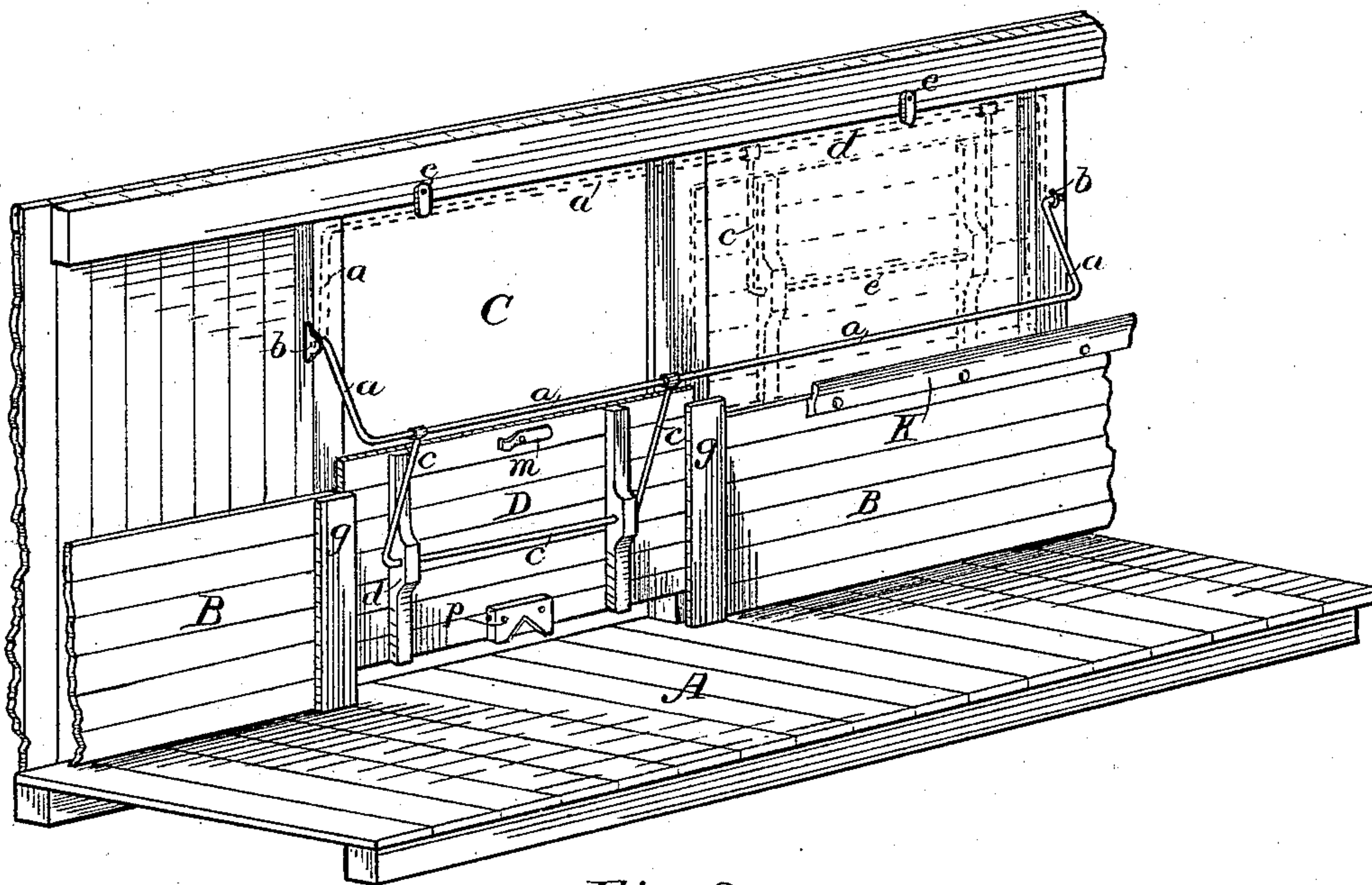
J. A. HAGAN.

GRAIN CAR DOOR MECHANISM.

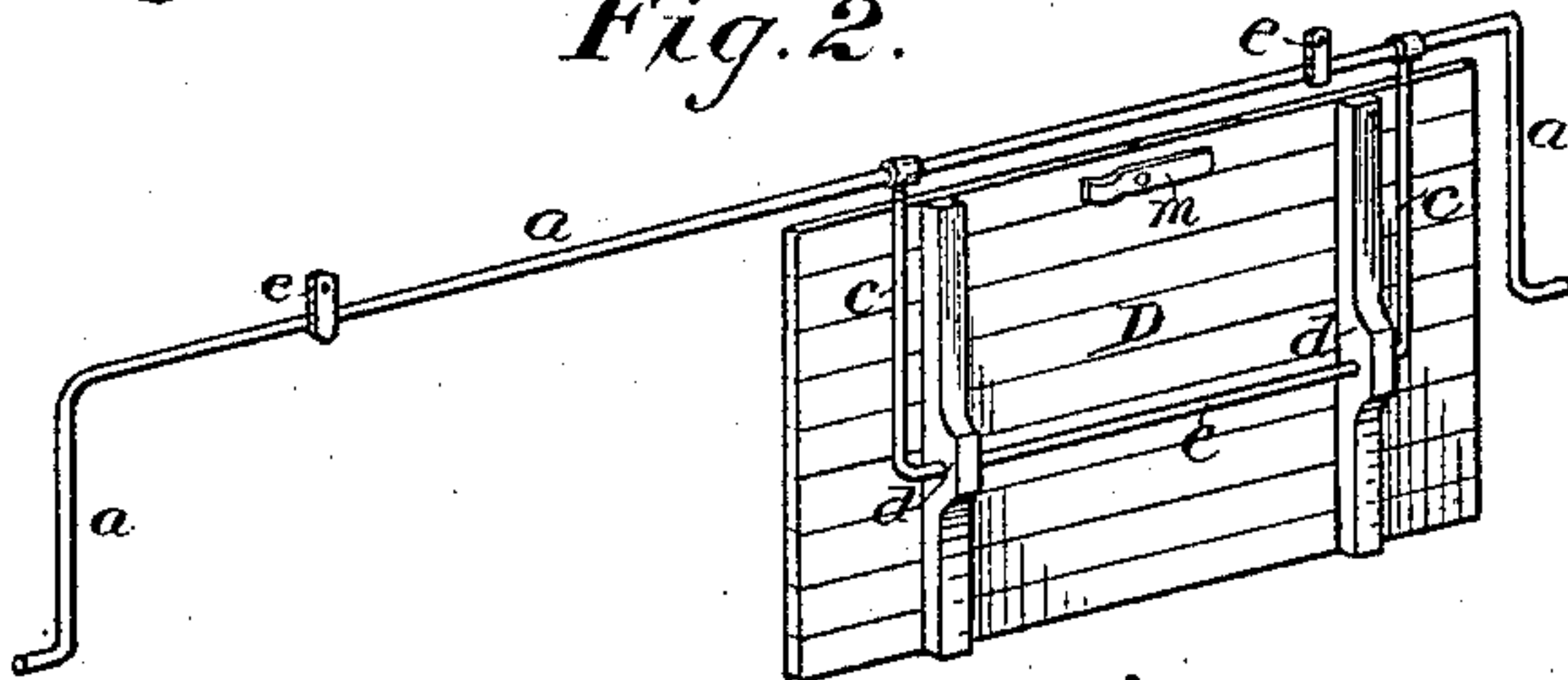
No. 285,258.

Patented Sept. 18, 1883.

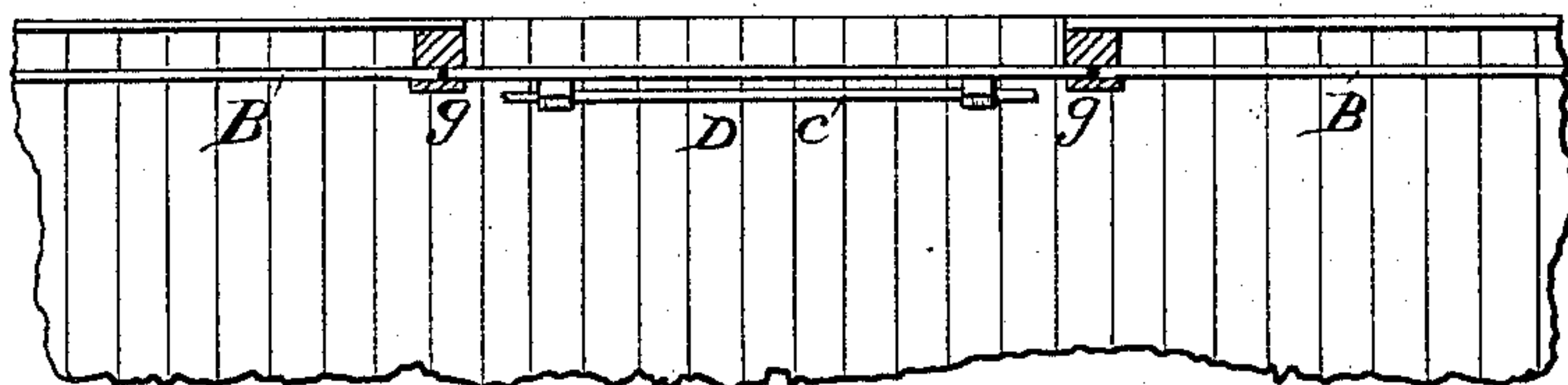
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



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(No Model.)

2 Sheets—Sheet 2.

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Fig. 4.

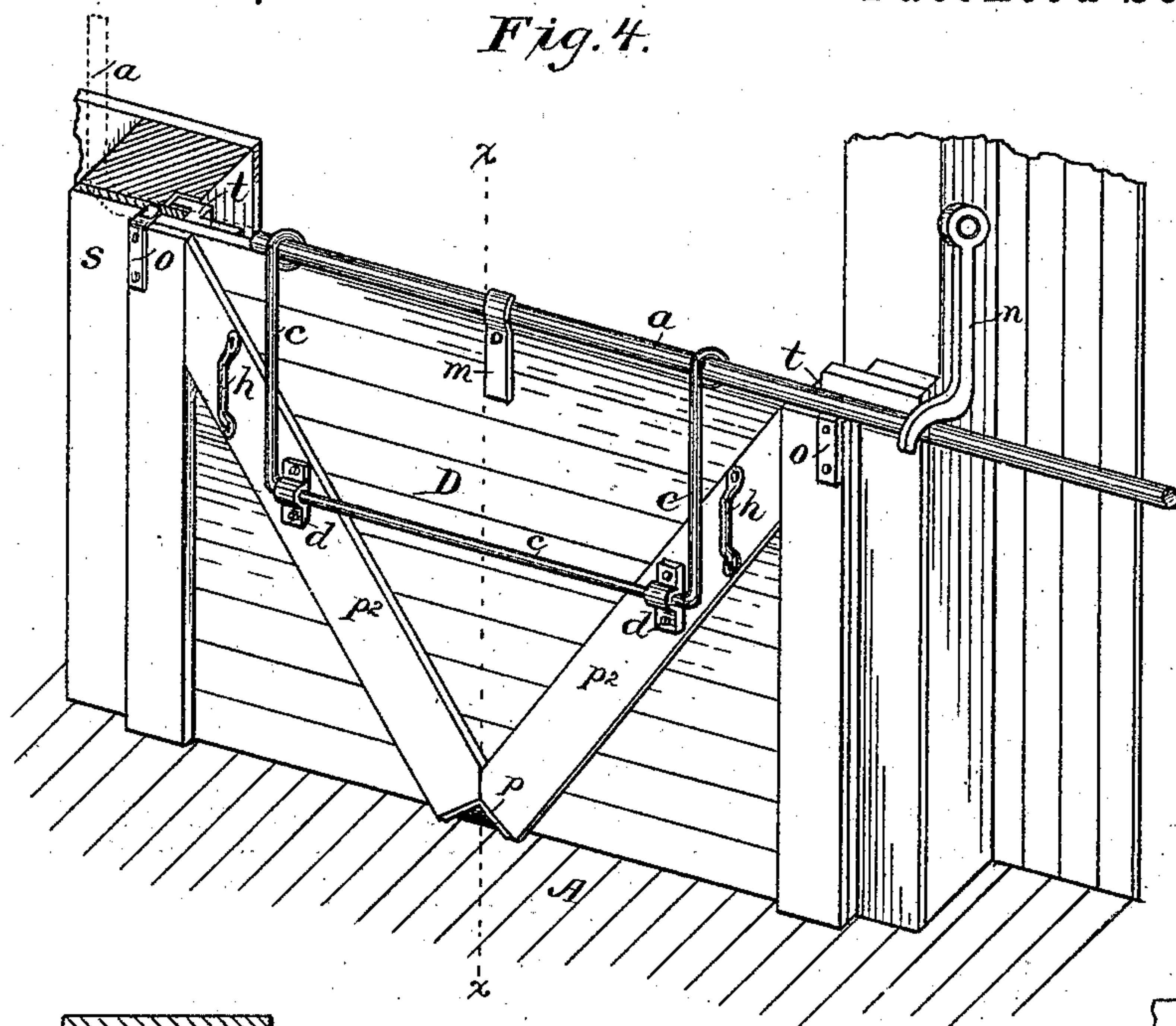


Fig. 6.

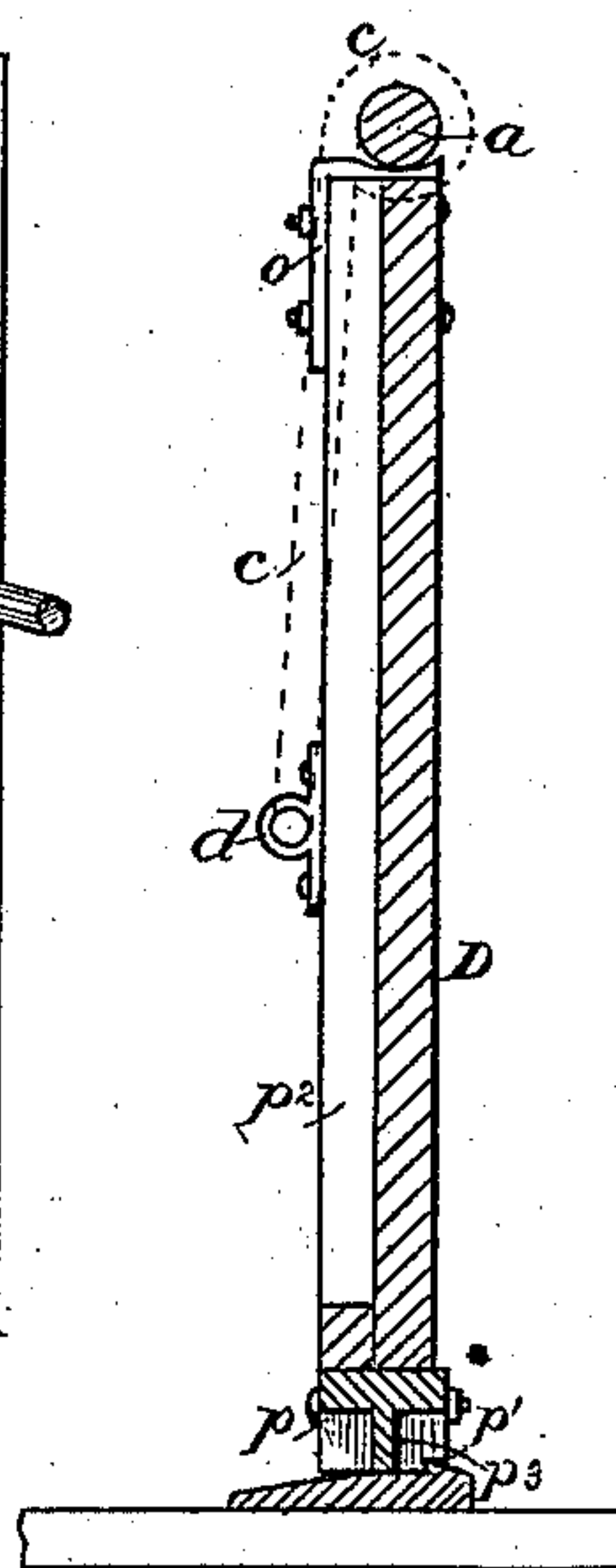


Fig. 5.

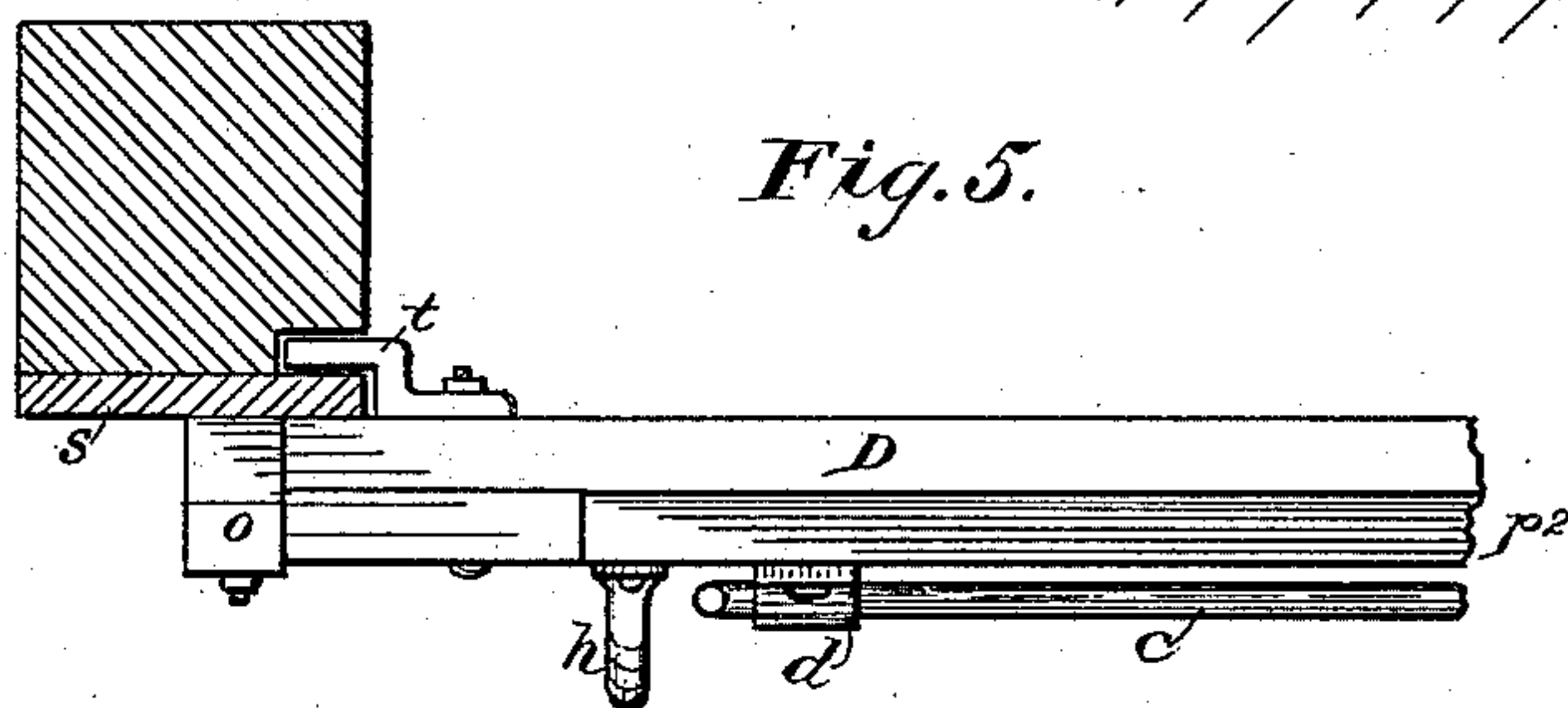


Fig. 9.

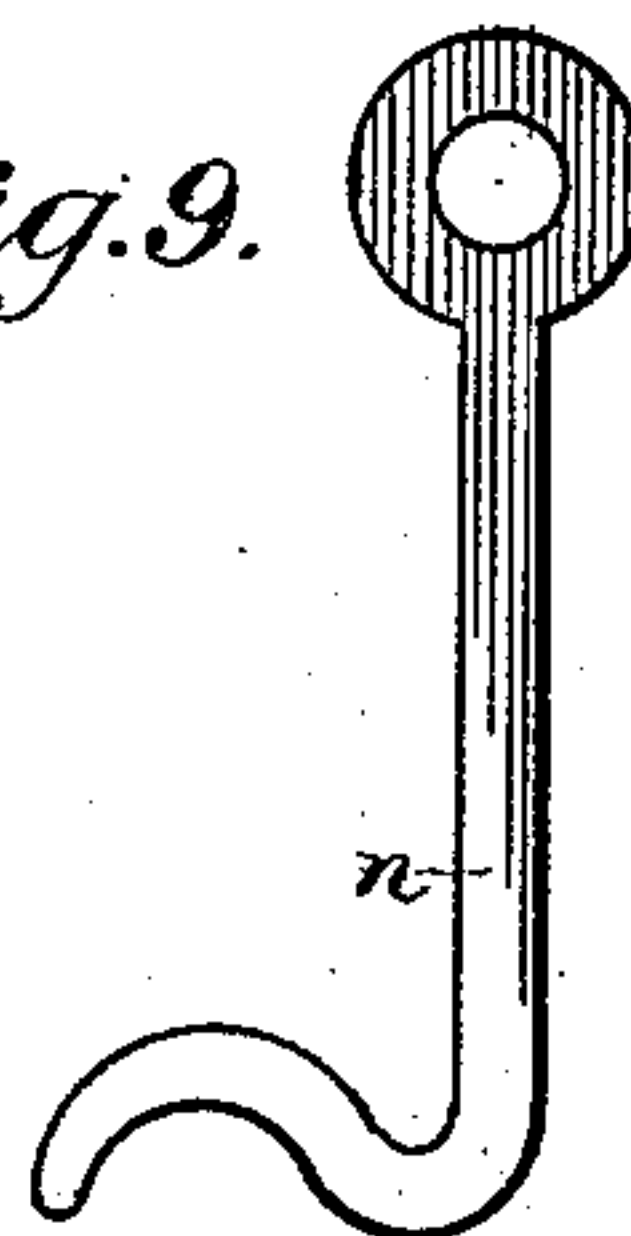


Fig. 7.

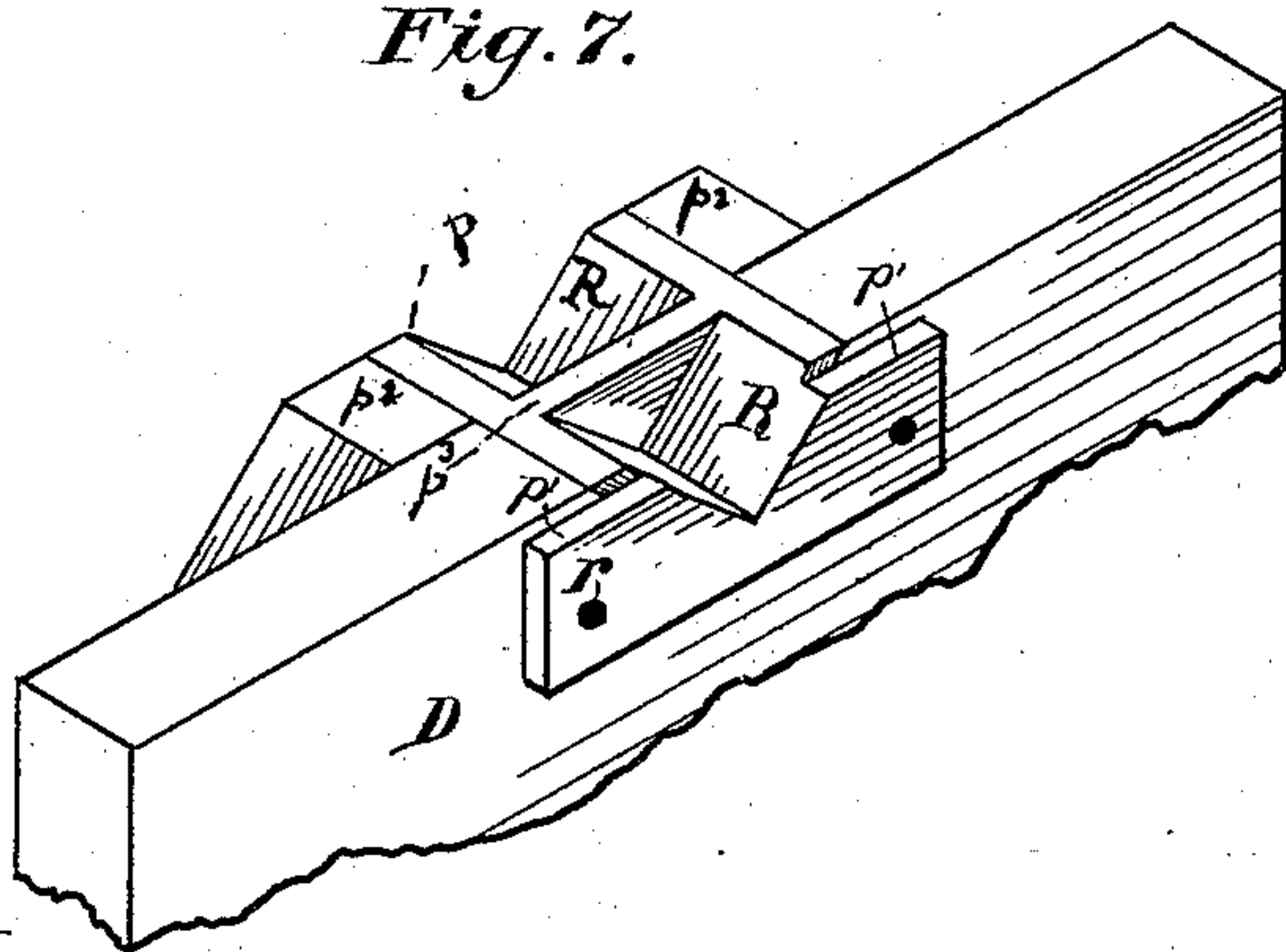
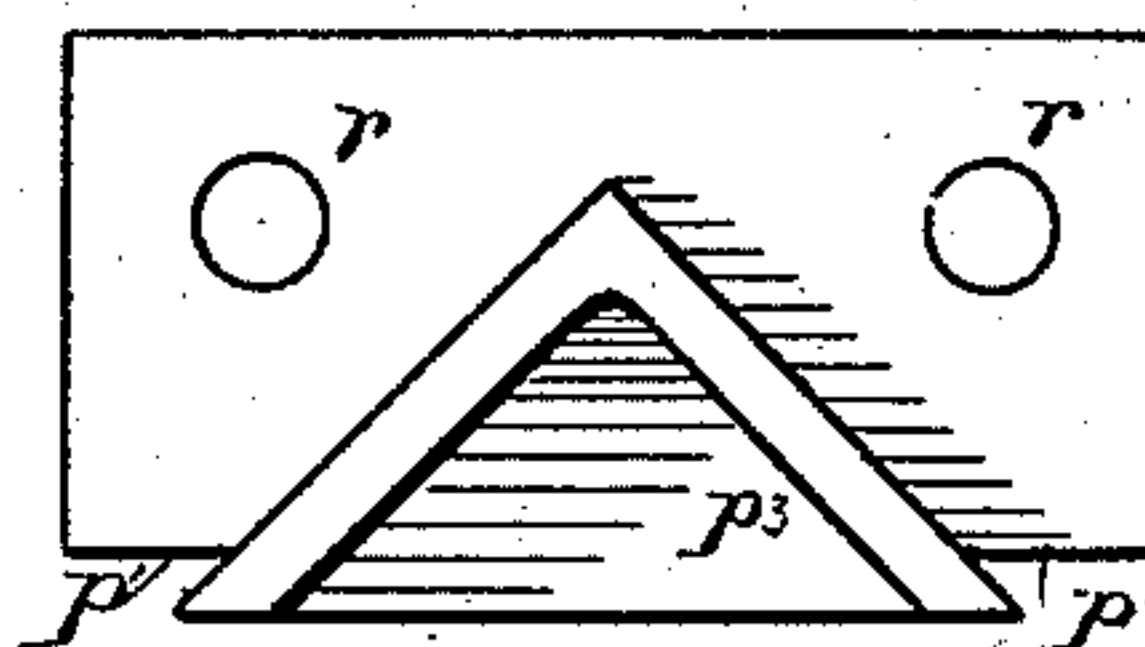


Fig. 8.



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# UNITED STATES PATENT OFFICE.

JOHN A. HAGAN, OF THREE RIVERS, MICHIGAN, ASSIGNOR OF ONE-HALF  
TO THE SHEFFIELD VELOCIPEDE CAR COMPANY, OF SAME PLACE.

## GRAIN-CAR-DOOR MECHANISM.

SPECIFICATION forming part of Letters Patent No. 285,258, dated September 18, 1883.

Application filed February 27, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN A. HAGAN, of Three Rivers, in the county of St. Joseph and State of Michigan, have invented certain new and useful Improvements in Grain-Door Mechanism for use in Freight-Cars, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of a part of the inside of an ordinary box or freight car with my improved door applied. Fig. 2 is a perspective view of the door and its hangings when not applied. Fig. 3 is a plan view of the door in position with part of its hangings broken away. Fig. 4 is an elevation of the door, showing an improved construction. Fig. 5 is a plan view of a part of the door, showing an improved door-guide. Fig. 6 is a vertical section on the line *xx* of Fig. 4. Fig. 7 is a bottom perspective view of a metallic grain-door lift. Fig. 8 is a side elevation of the same, and Fig. 9 is a view of a grain-door lock detached.

The object of my invention is to provide improved extra doors to be used in the better class of box or freight cars to close the openings in the sides of the cars tightly when the cars are used for transporting grain.

I construct and apply my improved extra doors so that they are permanently attached to the cars, and are therefore not liable to be lost or stolen, and yet are attached in such a manner that when the cars are used for other purposes than transporting grain these extra doors can be slid out of the way, and neither the doors nor their hangings will interfere with the use of ordinary freight-car doors.

My improvements are applicable to any kind of cars in which grain can be transported, and may also be useful elsewhere than in cars. Speaking in general terms, they consist in improved means for hanging grain-doors, by which they can be easily removed from and returned to their places in the doorways without being detachable from the cars; of means for locking grain-doors in the doorways to prevent the loss of grain; of means for holding the doors out of the way of other freight than grain when the cars are used for other freight;

of an improved way of framing grain-doors; of improved grain-door guides, which prevent the doors from being jammed by grain getting between the doors and guides, and which are not affected by the shrinkage of doors made of unseasoned lumber; of a door-lift, which, when used with my improved door, distributes the strains in lifting over the whole door, and of other improvements hereinafter set forth in detail and intended to be succinctly summed up in the appended claims.

In the annexed drawings, A represents the floor, B the side, and C the door-opening, of a box-car, all of usual construction.

D is the grain-door, used for closing the lower part of the door-opening when the car is loaded with grain, and in Fig. 1 is shown partly raised. Its length is something more than the width of the door-opening, and my design permits both the length and height to be made as great as desired without affecting the operation of the door.

*a* is a rod, preferably of round iron bent at its ends in the form of a double crank, and pivoted in suitable bearings, *bb*. These bearings are placed in such a relation to the grain-door that when it rests upon the floor of the car the cranked rod *a* will rest on its top with some pressure and hold it close to the floor. The rod *a* has the further use when in this, its lowest position, of forming a metal guard for the top of the door, so that it cannot be cut down to allow elevator grain-spouts to enter. (See Fig. 4.) The rod *a* may be only a little longer than the door in some cases, so as merely to provide for raising the door, and not for sliding it to one side of the doorway.

*c* is another cranked rod, pivoted at *dd* in suitable bearings, and with its ends turned over or suitably and loosely looped to the rod *a*, so that it can be turned freely in the loops and they can slide on the rod. Instead of the cranked rod *c*, two links, or even one central link, might be employed; but a cranked rod is better. Metallic tubes may be used to form the rods *a* and *c*.

*gg*, Fig. 1, are the grain-door guides, which may be of the usual form, but preferably are of the form shown in Fig. 5.



By means of the handles *h h*, the door may be raised to the top of the door-opening, which brings the crank ends of the rod *a* to a vertical position, when the door may be moved to one side in the position shown by the dotted lines, Fig. 1, where it is held by the buttons *e* and the bottom guide, *k*. Since the door is raised vertically, it may have flanged grain-tight guides or shoes at both ends, a property not possessed by any hinged or pivoted door. When the grain-door rests on the floor of the car, the rod *a* is held in position on its top by one or more buttons, *m*, and by the hook *n*, Fig. 9, which is pivoted on the side of the door-post, as shown at Fig. 4, and thus locks one end of the grain-door, while its opposite end is held tightly by its being directly under and in line with the pivoted end of the rod *a*. The corners of the door are protected by the straps *o o*, Figs. 4 and 5, which turn over its top, and may be slightly concaved on their upper surface to receive the locking-rod *a*, as shown in Fig. 6. As these corner-irons rest on the ends of the vertical battens, (which do not materially shrink longitudinally,) the tightness of the door-lock is not affected by the shrinking of unseasoned lumber of which the door may be made.

The door-lift *p*, Fig. 4, is preferably of cast-iron and of the shape shown in Figs. 7 and 8, having lifting-recess *R*. Its flange *r* rests against the outside of the door and provides a means of securing it thereto, and its rabbeted lower edge, *p'*, Fig. 6, allows it to fit over the door-threshold. Its partition *p''* makes it grain-tight when the door is down. Its use is to provide a convenient means of raising the door from the outside when it is desired to allow the grain to escape below it in unloading. It also serves as a footing for the diagonal braces *p''* of the door, and through them the strain of lifting the door is better distributed to all parts of the door, so that it will rise evenly and not be so apt to bind in its ways.

The grain-door guides, Fig. 5, consist of a flat plate of metal, *s*, secured to the door-post, and of the angle-piece *t*, secured to the outside of the grain-door, both of which preferably extend from the top to the bottom of the door. The door-post may be rabbeted to clear the piece *t*, or the plate *s* may extend beyond the door-post. In either case the door is held grain-tight against the plate *s*, and this tightness is not affected by the shrinking of unseasoned lumber of which the door may be made. It will thus be seen that when the door is in its place in the doorway it is tightly locked therein, and is also grain-tight, and when it is moved to the position shown by the dotted lines, Fig. 1, it and all its attachments are out of the way of freight and of ordinary doors, and the trouble of detaching and the expense of housing are avoided. The hook *n* should be so adjusted and have such a resilient quality that it will brace the rod *a* down firmly on the top of the door; but this

hook, although a useful adjunct, is not indispensable, because the cranked rod *a* of itself forms a very good lock for the door, and works automatically for that purpose whenever the door is brought down to place.

The result of the improved construction above described in detail is that I get, first, a set of hangings for a grain-door so constructed as to automatically lock the door in place when in use; second, a set of hangings which form a guard for the top of the grain-door when it is in use; third, a grain-door hung with a crank for elevating it; fourth, a grain-door hung with a crank to admit of vertical and horizontal motion of the door; fifth, a door combined with hangings permanently connecting it with a car so constructed as to admit of the use of door guides or plates at both ends of the door; sixth, a grain-door hung with two cranked rods; seventh, a grain-door hung with cranks, so that the door and cranks will clear the doorway when the door is not in use; eighth, an improved grain-door having diagonal braces resting at their lower ends upon the door-lift; ninth, an improved door-lift; tenth, improved grain-tight metal guideways for grain-doors; eleventh, an improved lock for grain-doors; twelfth, means for putting the door and its hangings out of the way against the upper side of the car-wall and fastening them there.

I am aware that previous to my invention it has been proposed to secure to a door-post an angle-iron in which the door shall slide, and I do not claim such subject-matter.

Without intending to confine myself to the exact details of construction herein specified, and having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination of the pivoted cranked hanging *a*, which extends across and beyond the door-opening, as described, and the grain-door loosely connected to the hanging, whereby the door may have both a vertical and a horizontal sliding movement, both movements being in a line parallel with the door-opening, substantially as set forth.

2. The combination of the grain-door, the cranked rod *a*, upon which the door slides horizontally, and the cranked rod *c*, by which the door is hinged to the rod *a*, and which permits the door to have a vertically sliding movement, both the vertical and the horizontal movements being in a plane parallel with the door-opening, substantially as set forth.

3. The combination of the grain-door, the cranked rod *a*, loosely connected or pivoted to the door, so that it may have a horizontal and a vertical movement in a plane parallel with the door-opening, and the lock *n*, substantially as set forth.

4. The combination of the vertically-sliding grain-door, the vertical metallic plates *s*, secured to the door-posts, and the angle-irons *t*, secured to the door, which embrace the edges of the plates *s* from end to end, as set forth,



so that a grain-tight guide is made for the door irrespective of any shrinkage of timber, substantially as described.

5 5. The combination of the vertically and horizontally sliding grain-door, the cranked rod *a*, by which the door is lifted and on which it slides, and means for securing the door at one side of the doorway, substantially as set forth.

10 6. The combination, with the grain-door, of the cranked locking-rod *a*, and the straps *o o*, secured to the door and concaved on their upper surfaces to receive the locking-rod *a*, substantially as described.

15 7. The combination of the door and the metallic lift secured thereto, said lift being provided with flanges *r*, recesses *R*, and a partition, *p*<sup>3</sup>, between the recesses, as set forth.

20 8. The combination, with the grain-door, of the lift constructed substantially as shown, and

secured to its bottom edge, so as to afford a handle on both sides of the door, substantially as set forth.

9. The combination of the main body of the grain-door with the lift and the diagonal 25 braces *p*<sup>2</sup>, which are supported by the angular sides of the lift, substantially as set forth.

10. The combination of the vertically-sliding grain-door, the cranked locking-rod, the metallic concaved bearing-straps *o o*, and means 30 for locking the rod, substantially as and for the purpose specified.

In testimony whereof I have hereunto subscribed my name this 21st day of February, A. D. 1883.

JOHN A. HAGAN.

Witnesses:

J. P. McKEY,

EDWARD B. LINSLEY.