

T. A. BISSELL & R. MILLER.

Improvement in Grain-Car Doors.

No. 132,237.

Patented Oct. 15, 1872.

Fig. 1.

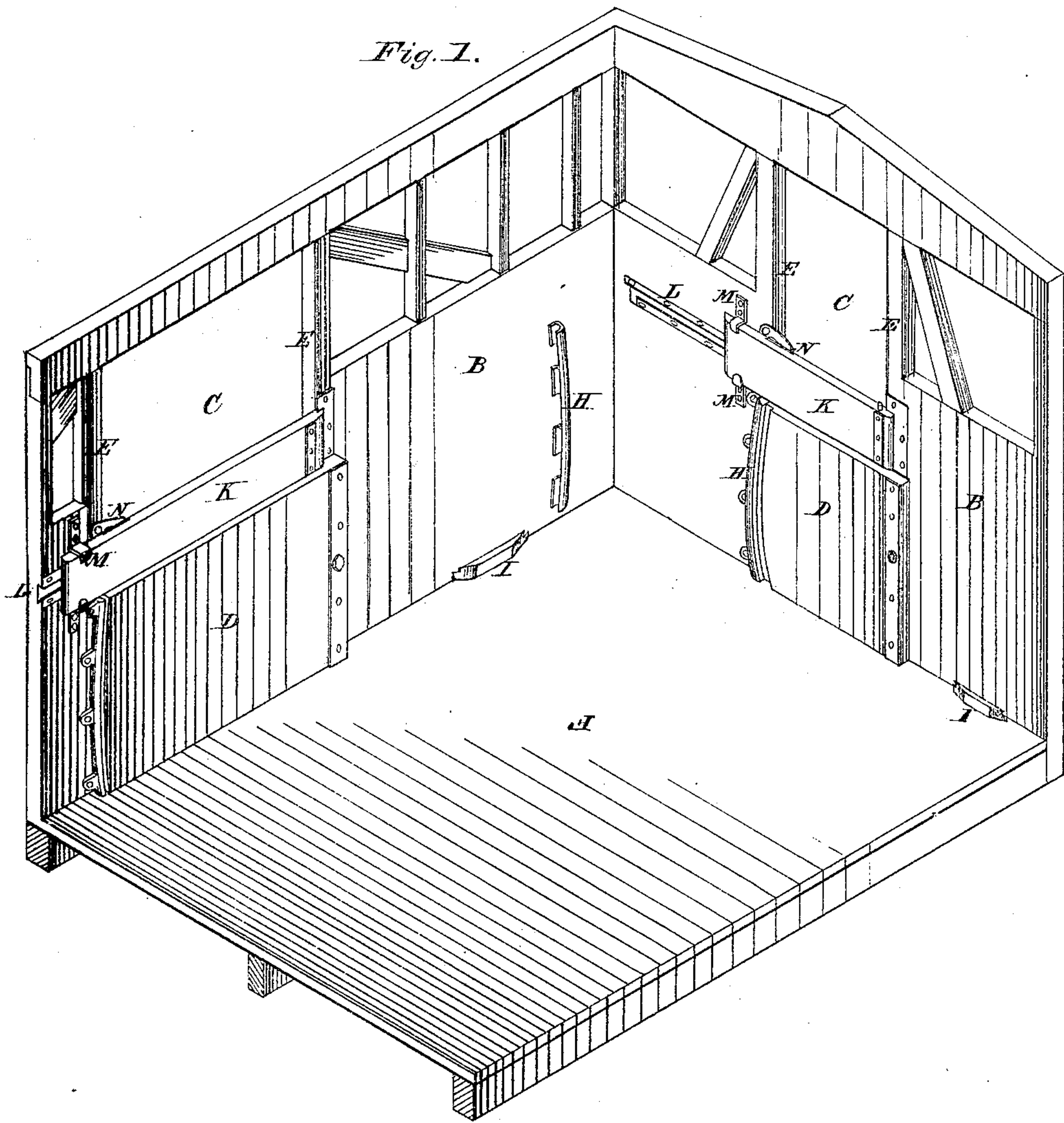
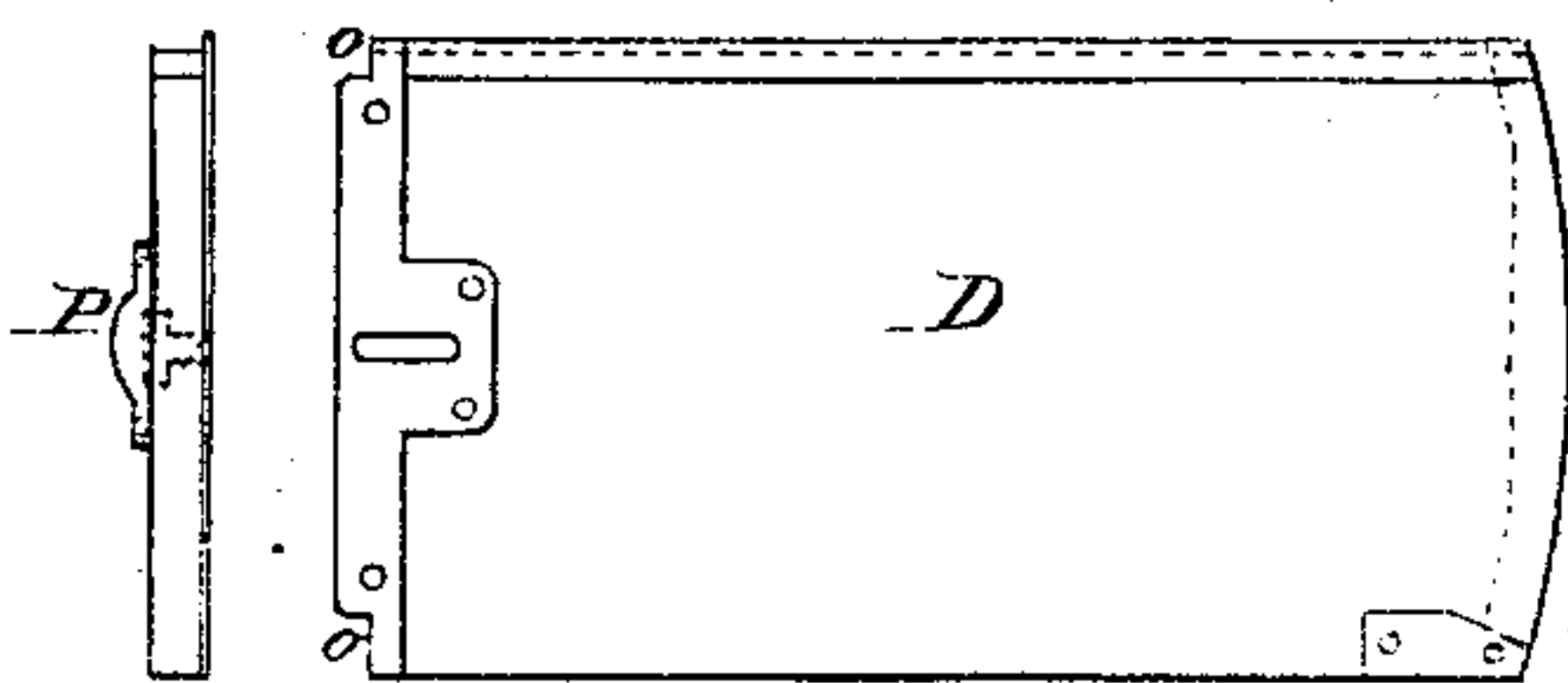


Fig. 5.



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Fig. 2.

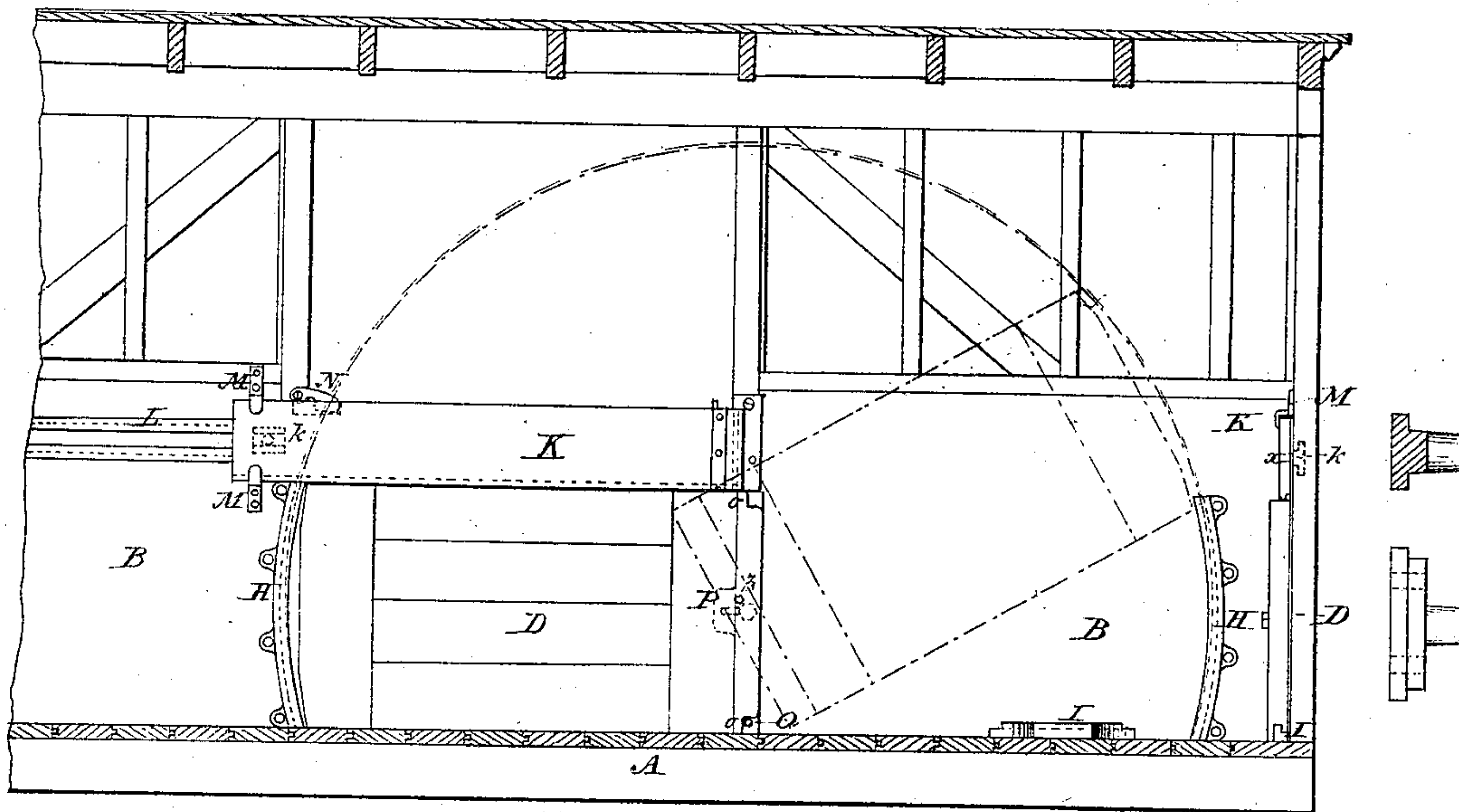


Fig. 3.

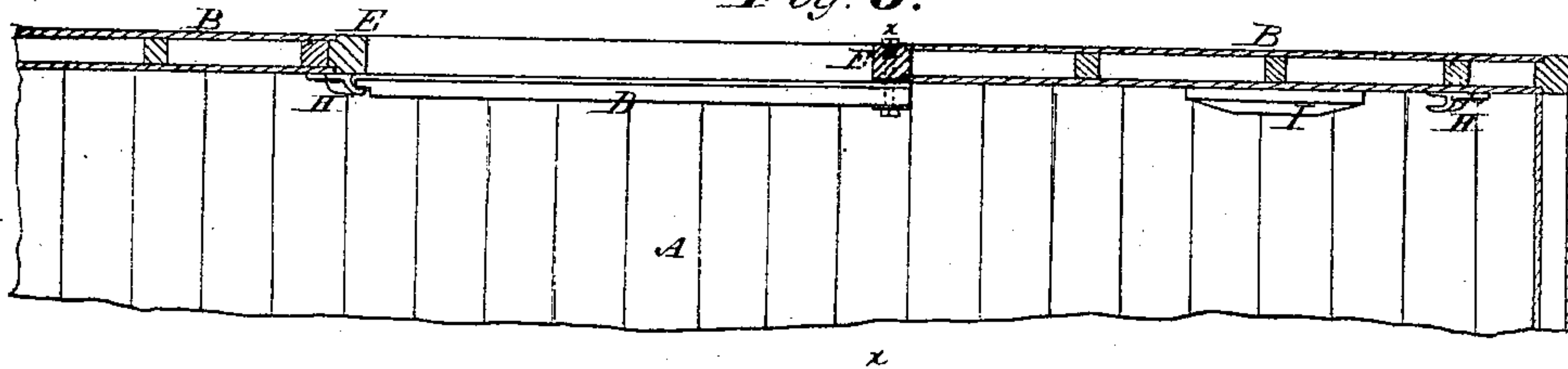
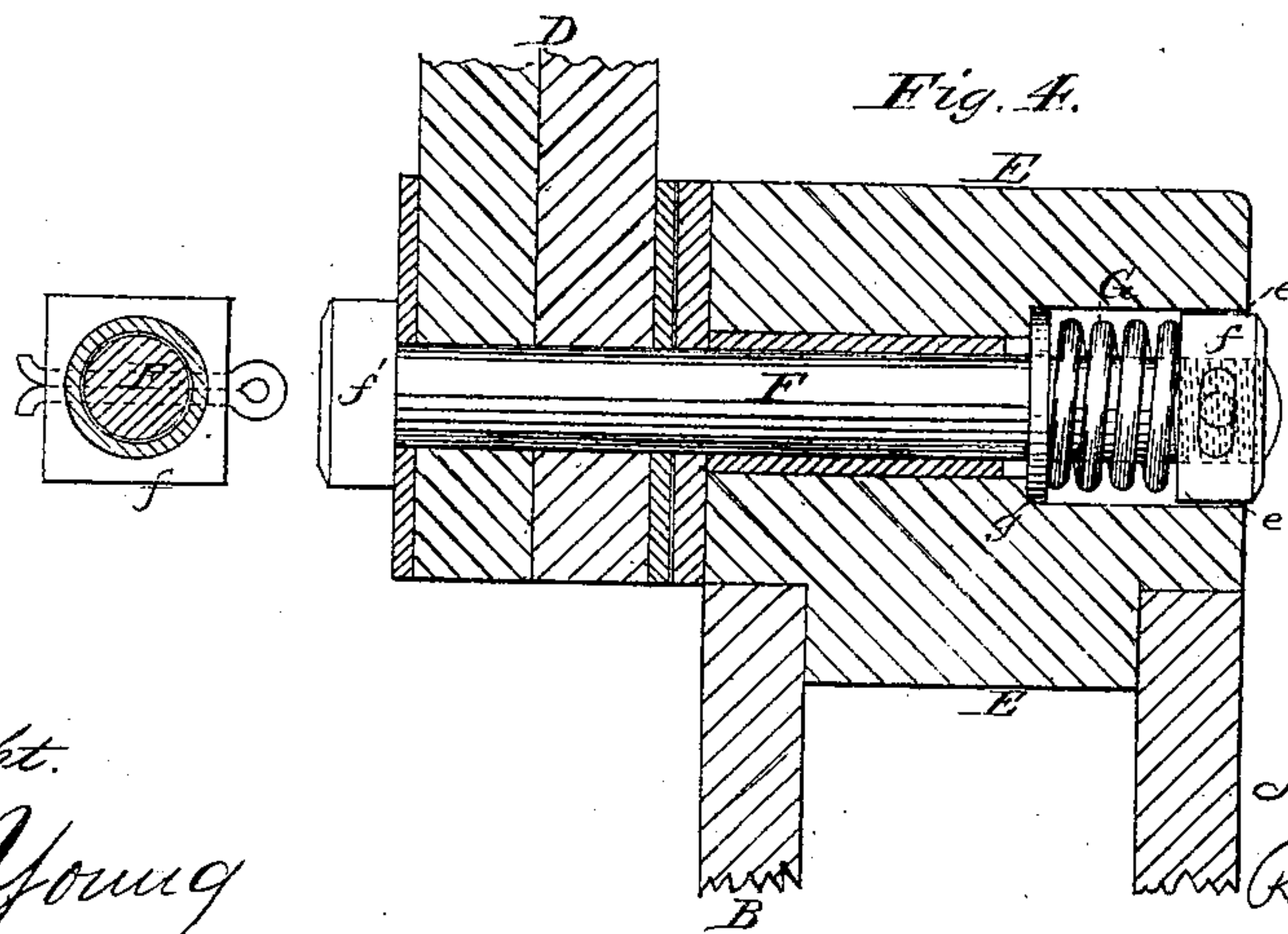


Fig. 4.



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UNITED STATES PATENT OFFICE.

THOMAS A. BISSELL AND ROBERT MILLER, OF AURORA, ILLINOIS.

IMPROVEMENT IN GRAIN-CAR DOORS.

Specification forming part of Letters Patent No. 132,237, dated October 15, 1872.

To all whom it may concern:

Be it known that we, THOMAS A. BISSELL and ROBERT MILLER, of Aurora, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Grain-Car Doors; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is a perspective view of the inner side of a car containing our improved doors; Fig. 2 is a vertical longitudinal section of the same, showing in dotted lines the door partly opened; Fig. 3 is a horizontal section of said car on line *x x* of Fig. 2; Fig. 4 is a plan view of the axial bolt employed for pivoting the door to or upon the door-frame; and Fig. 5 is an end view and an elevation of the outer side of our door, showing a modification in the construction of the axial bearing-plate.

Letters of like name and kind refer to like parts in each of the figures.

Our improvements are applicable to any style of freight-car in which grain can be transported; and they consist, principally, in a grain-door pivoted at one end, and at or near its vertical center, so as to be capable of a radial edgewise motion in a vertical plane, substantially as and for the purpose hereinafter specified. It consists, further, in the construction of the pivotal bolt, upon and around which the door rotates, substantially as and for the purpose hereinafter shown. It consists, further, in the construction of the axial bearing of the door by means of which said door is enabled to rotate in a car having a low roof, substantially as is hereinafter set forth. It consists, finally, in the construction of the combined supplemental door and cattle-bar, and its combination with the main door and the car side, substantially as and for the purpose hereinafter specified.

In the annexed drawing, A represents the floor, and B the side of a freight-car, within the latter of which parts is provided an opening, C, for the discharge of grain or other freight, all of usual construction. The lower portion of the opening C is inclosed by means of a door, D, which has a length somewhat greater than the breadth of said opening, and is pivoted at one end, and at or near its vertical center, to or upon the post E, so as to be ca-

pable of being turned upon its pivot edgewise and in a vertical plane upward and away from said opening. For use within grain-cars it is requisite that the door should bear closely against its frame, while from the nature of the material employed in the construction of cars it is necessary that suitable provision should be made for the expansion or shrinkage of parts from moisture or extreme heat. This result is accomplished by providing within the outer side of the door-post E a recess, *e*, within which the nut *f* upon the outer end of the pivotal bolt F may move freely inward. A washer, *g*, is placed at the lower end of the recess *e*, and around the bolt F and between said washer and the nut *f* is placed a spiral spring, G, which, encircling said bolt, presses outward upon said nut and causes the bolt-head *f'* to hold the door against the inner face of the door-post with a pressure corresponding to the strength of said spring. As thus arranged, it will be seen that the lateral expansion or contraction of the door or its frame can have no other effect than to slightly increase or diminish the constant but yielding pressure of the former upon the latter, and that, therefore, no liability exists to such closeness or looseness of said bearing as to impede the free operation of said door or to permit the escape of grain between the same and its frame. The forward end of the door D is formed upon a circle of which the center *z* is slightly above and forward of the pivotal bearing, and is confined in place by means of a metal shoe, H, which, having a corresponding curve, is secured to or upon the car side, and extends outward therefrom to a distance equal to the thickness of said door, and then inward so as to embrace the inner side of the same. A similar shoe, H, is placed upon the car side in such a position as to cause it to receive the end of the door D when the latter is turned away from the opening. For use in cars employed for both grain and stock the door is pivoted at a point from one to two inches above its vertical center, so that when opened the edge of said door, resting upon a block, I, and parallel with the floor, shall be sustained correspondingly above the latter and out of the way of liquid filth, which, by freezing, would otherwise prevent the closing of the same.

The door described is constructed with a

sufficient height to enable the car to carry a full load of wheat or other heavy grain; but as other kinds of grain possess greater bulk for a given weight, the following-described means are employed for inclosing the opening C to a higher point whenever such may be necessary.

A bar, K, having any desired width, and a length somewhat greater than the breadth of the opening C, is provided, upon its outer face and near one end, with a lug, *k*, which, transversely, has the form of a dovetail tenon, and fits into a corresponding slotted guide, L, attached to or within the side of the car, the relative positions of said parts being such as to enable said bar to rest upon and slide along the upper edge of the door D. Two lugs, M, secured to or upon the car-side, extend outward beside the edges of the bar K, and then vertically inward over the inner side of said bar, hold the latter in vertical and lateral position against and with relation to the slotted guide and the contiguous door-post, without interfering with the free longitudinal movement of said bar. The forward end of the bar K, being suitably shod with metal, fits into a slot provided in the corresponding door-post, and is thereby secured in lateral and vertical position, while its longitudinal position is insured by means of a metal lug or ear, N, which is pivoted to the door-post immediately above said bar, near its rear end, and when turned downward and forward fits into a corresponding notch provided within the upper edge of the same.

In some instances the height of the car is not sufficient to permit the door to be operated, in which event the following-described construction of the latter is employed. The opening for the passage of the pivotal bolt F is lengthened horizontally so as to permit a certain degree of longitudinal motion of said door upon said bolt, the amount of such motion being equal to the distance to which the door is required to drop in order that its end may pass beneath the car-roof. A pin, O, is placed within the door-post, and extends horizontally outward from the same near the floor of the car, and directly beneath the pivotal bearing, in which position said pin engages with the corner of the door and presses said door forward to position within its shoe whenever turned downward in either direction. In order that one pin may operate as a stop when the door is turned in either direction, a notch,

o, is provided within each inner corner of said door, the inner or vertical sides of said notches being about upon a line with the center of the bolt F when said door occupies a horizontal position. The slotted opening within the pivotal end of the door is protected by metal, while the inner side of said opening and the head of the bolt F are protected by means of a metal cap, P, which is secured to or upon said door and incloses said parts.

The forward end of the door being formed upon a circle eccentric to its pivotal bearing, by raising said end for the purpose of opening said door it is immediately removed from contact with the shoe and moves freely therein; while upon closing the door a contrary effect is produced, so that when down to place its end bears firmly against said shoe and prevents end motion.

The doors thus constructed afford a simple, cheap, and efficient means, whereby an ordinary freight-car can be converted into a car for the transportation of grain without lessening its desirability for ordinary purposes.

Having thus fully set forth the nature and merits of our invention, what we claim as new is—

1. A grain-door for cars, pivoted at one end at or near its vertical center, and capable of a radial edgewise motion in a vertical plane, substantially as and for the purpose specified.

2. The pivotal bolt F, provided with the nut *f* and head *f'*, and combined with the spring G, the recessed door-post E, and the door D, substantially as and for the purpose shown.

3. A grain-door for cars, pivoted at one end, and having a radial edgewise motion in a vertical plane, when said door is capable of moving longitudinally upon its pivotal bearing, substantially as and for the purpose set forth.

4. The combined supplemental door and cattle-bar K, provided with the lug *k*, and combined with the slotted guide L, the car side, and the door D, substantially as and for the purpose specified.

In testimony that we claim the foregoing we have hereunto set our hands this 6th day of August, 1872.

THOMAS A. BISSELL.
ROBERT MILLER.

Witnesses:

JOHN H. PEASE,
ROSWELL WILDER GATES.