

No. 704,846.

Patented July 15, 1902.

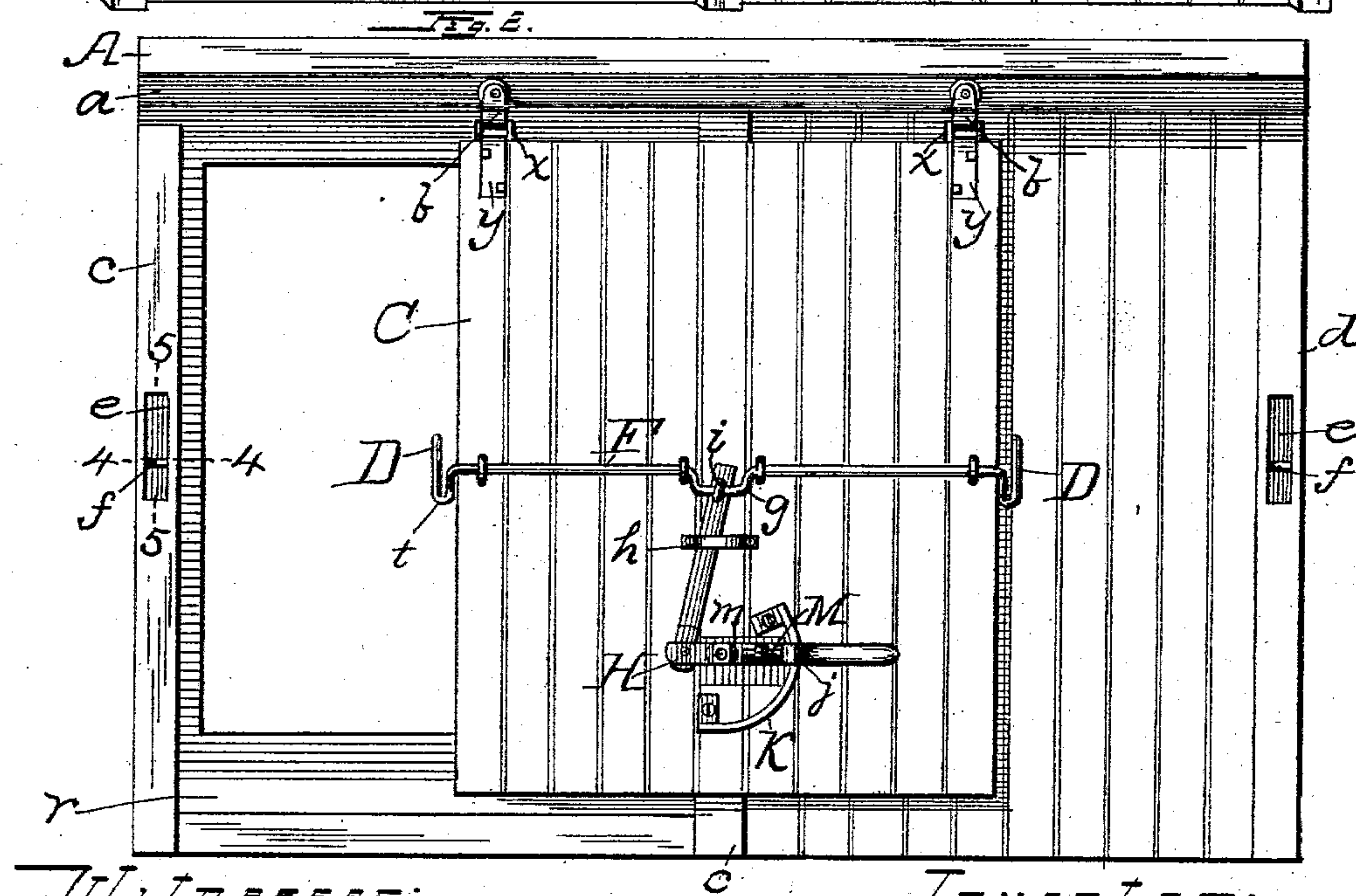
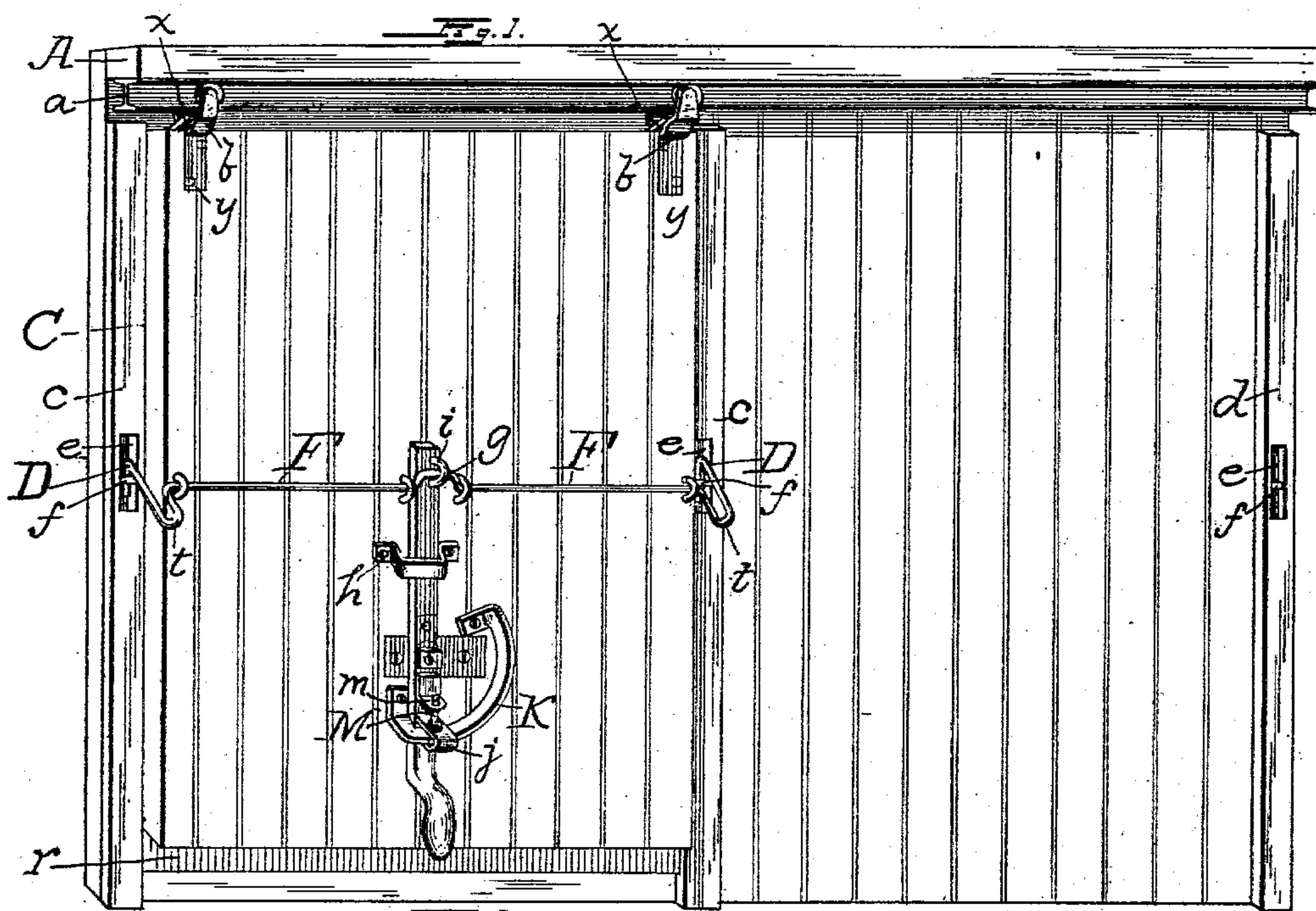
J. F. LYDON.

SLIDING DOOR.

(Application filed Oct. 19, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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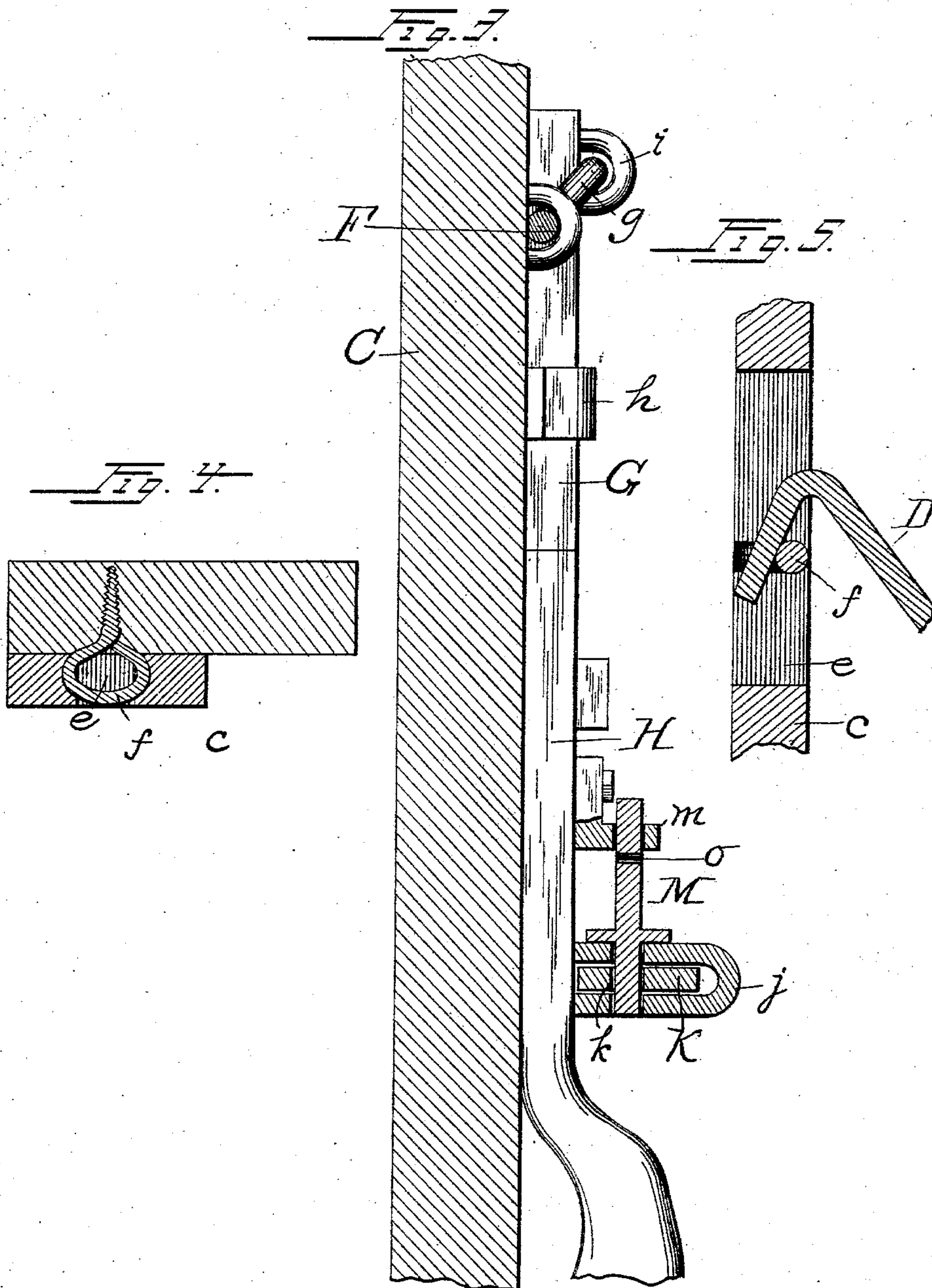
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(No Model.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

JOHN F. LYDON, OF DAVENPORT, IOWA, ASSIGNOR TO THE INTERNATIONAL MANUFACTURING COMPANY, OF DAVENPORT, IOWA, A CORPORATION OF IOWA.

SLIDING DOOR.

SPECIFICATION forming part of Letters Patent No. 704,846, dated July 15, 1902.

Application filed October 19, 1900. Serial No. 33,541. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. LYDON, a citizen of the United States, and a resident of Davenport, in the county of Scott and State of Iowa, have invented certain new and useful Improvements in Sliding Doors, of which the following is a full, clear, and exact specification.

My invention relates more particularly to the sliding door for which I made application for Letters Patent of the United States March 19, 1900, series of 1900, No. 9,214, in which the means for suspending the door are so constructed that the latter can be easily moved in a longitudinal direction and at the limits of its longitudinal movement can be moved sidewise to a limited extent to fit closely against or into the surrounding framework of the doorway or the sides of the wall adjacent thereto.

My invention is particularly adaptable for railway-car doors and barn-doors; and its object is to provide simple and economical means for moving said doors sidewise and locking the same against the supporting-wall either in its closed or open position that prevent shifting and resultant strain on fastenings. This I accomplish by the means hereinafter fully described and as particularly pointed out in the claims.

In the drawings, Figure 1 is a perspective view of my invention. Fig. 2 is a side elevation of the same, showing the doorway in such position as to leave the doorway half open. Fig. 3 is a transverse vertical section taken on dotted line 3 3, Fig. 2, looking in the direction indicated by the arrows. Fig. 4 is a horizontal section of the door-frame of a freight-car, taken on dotted line 4 4, Fig. 2. Fig. 5 is a vertical central section of a portion of the same, taken on dotted line 5 5, Fig. 2.

In the drawings I have shown the application of my invention to a freight-car door; but with the exception of some slight changes or additions in minor details the following description of my invention would be applicable to sliding doors for other structures.

The eaves of freight-cars, to which it is desired to apply my invention, are preferably,

particularly in the neighborhood of the doorway of the car, extended outward sufficiently to enable a two-by-two or two-by-four horizontal timber A to be placed immediately under the same. Secured by bolts or otherwise to the under side of this timber A or any other suitable support and extending from one side of the doorway longitudinally a distance slightly exceeding about twice the width of the door is an I-beam *a*, which constitutes the tram or track, upon the lower flanges of which the rollers or wheels of the carriers or trucks *b* travel.

The trucks *b b*, which support each end of the door, consist of a U-shaped strap, the ends of the corresponding branches of which are provided with inwardly-projecting studs, upon which the rollers are loosely journaled. The bend of this U-shaped strap comes under the lower flanges of and in the same vertical plane as the web of the I-beam *a* and is shaped so as to provide a seat for the upper horizontal side of a link *x*, which is journaled therein. The lower horizontal part of this link is journaled in the knuckle of an inverted-U-shaped strap *y*, the branches of which are secured to each side of the car-door C.

The I-beam *a* is set out from the side walls of the car a slight distance, and the trucks *b*, by means of which said door is suspended, are secured one near one vertical edge and the other near the other vertical edge thereof. Thus the door when suspended under said I-beam hangs in the same vertical plane as the web thereof and is free to be moved or slid from one to the other end of the I-beam and when at the limits of its longitudinal movement can be pushed laterally toward the car in a perfectly vertical position and closed flush against the same or against the jamb of the doorway therein so tightly as to exclude the air and dust from the car.

Secured to the car are two vertical strips *c c* of wood, and secured to the same side of the car on that side of the doorway toward which the door is moved to open the same is a corresponding vertical strip *d*, which is separated the width of the door from the nearest strip *c*. In other words, these strips *c c d*

are equal distances apart and are so located that when it is desired to close the doorway the door must be moved bodily sidewise between strips *c c* flush against the jamb of the same, and when the doorway is fully opened by shoving the door to the limit of its movement in the opposite direction it can be moved sidewise and secured flush against the walls of the car between strips *c* and *d*. In order to accomplish this lateral movement of the door and lock it against the car, I have about the center of height of strips *c c d* provided the same with vertically-elongated recesses *e e e*, and at their centers of length provided said recesses with a hasp or eye *f* to make a simple form of lock counterpart. Engaging these counterparts are two hooks *D D*, which are secured on the ends of a horizontal rock-shaft *F*, which extends slightly beyond the sides of the door, at about the center of height of which it is journaled in suitable bearings about as shown. Mediate its ends rock-shaft *F* is provided with an outwardly-projecting crank *g*, the movements of which are confined by a guide-strap *h*, which guide-strap may be placed above said crank, if deemed necessary or desirable, and engaging this crank is a vertically-disposed link *G*, which near its upper end has a staple *i* projecting from it, through which the bend of said crank passes, as shown. The lower end of this link is jointed to the end of a short lever *H*, which latter is fulcrumed to the door in the same vertical plane as the center of said crank, and the lower end thereof is provided with a suitable handle to afford a convenient hand-grasp for the operator. Between the fulcrum and handle of the lever it is provided with an outwardly-projecting lug *j*, which has a transverse opening through which the curved portion of a segmental frame *K* passes. One end of this frame *K* terminates at a point below the fulcrum of the lever, and the other end thereof terminates slightly above a horizontal plane striking through the center of said fulcrum. At a point in the same vertical plane below the fulcrum of lever *H* segmental frame *K* is provided with an opening *k*, into which when said lever is moved to a vertical position in alinement with said link a bolt *M* will gravitate. This bolt has its upper portion journaled in the end of a lug *m*, extending outward from lever *H* between lug *j* and its fulcrum, but the end thereof nearest the handle of the lever is movable in opening in the lug *j*, between which and lug *m* said bolt is provided with a collar, so as to limit its longitudinal play and prevent loss thereof. When the bolt is brought in vertical alinement with opening *k* in the segment, it gravitates through the opening in lug *j* and said opening *k* and locks the lever. The upper end of bolt *M* is provided with a seal-opening *o*, which comes just below lug *m* when lever is locked, through which the wire of an ordinary car-seal can be passed, if desired, so as to prevent the unlocking of the

lever without detection. If desired, the bolt may be of such length that when in position to lock the lever its lower end will extend down below lug *j* and have an opening therein of sufficient size to permit the bow or yoke of an ordinary padlock to be placed there-through.

When the door is at the limit of its longitudinal movement in front of the doorway and it is desired to close the same, lever *H* is moved into a vertical position, thus moving the link *G* to the limit of its upward movement and through its engagement with the crank of the rock-shaft cause the hooks to enter the recesses *e* in the strips *c c* and engage the hasps or eyes *f*. This engagement lifts and at the same time causes the door to move toward and flush against the jamb of the doorway, thus effectually closing the same. When in this position, the weight of the door is not borne by the trucks, but by the hooks. I prefer to secure between strips *c c* at a suitable distance below the sill of the doorway a horizontal cleat or ledge *r*, against which the lower edge of the door will impinge when said door is closed and keep dust and snow, &c., from getting past the same into the car.

In order to economize in the manufacture of the locking devices, slight changes may be made in the material and shape of the parts of the same without departing from the principle of my invention. As shown in the drawings, I prefer making the rock-shaft *F* and hooks *D D* of one continuous stretch of metal rod or bar. In bending the ends of this bar to make the hooks I prefer to first give said rods an outward detour to form crank-shaped arms *t t*, which when the rock-shaft is moved so that the crank *g* thereof is at the limit of its downward movement will bear against the strips *c c* or *c* and *d* and assist in forcing the door out into its suspended position. The usefulness of these arms *t* will be apparent when in winter the ice around the edges of the door would hold it fast.

What I claim as new is—

1. The combination of a wall having a doorway therein, the three vertically-disposed strips *c* secured to the wall and extending outward therefrom, the strips being at uniform distances apart, and two of the strips being arranged adjacent to the opposite edges of the doorway in the wall, a track arranged above the doorway, a sliding door mounted upon the said track and arranged to travel in front of the intermediate strip, the said door being capable of a limited lateral movement while retaining its vertical position, and means for moving the door laterally inward toward the face of the wall between either pair of the said strips, substantially as set forth.

2. The combination of a suspended sliding door capable of a limited lateral movement, a track upon which the door is supported, a horizontally-disposed crank-shaft for locking the door, a lever mounted upon the door, and

a connecting-link between the lever and the crank-shaft, these parts being disposed to have the arm of the lever to which the link is connected and the link in alinement when the rock-shaft is turned to locking position, substantially as set forth.

3. The combination with a wall having a doorway therein and lock counterparts on either side of the doorway, of a sliding door capable of a limited lateral movement, a crank-shaft having its ends formed to engage with the said lock counterparts, a lever supported by the door and arranged to move in a plane parallel with the face thereof, and a connecting-link between the lever and the crank-shaft, said link and the arm of the lever to which it is connected being arranged to be in alinement when the crank-shaft is turned into position to cause the locking of the door, substantially as set forth.

4. The combination with a wall having a doorway therein, a suspended sliding door capable of a limited lateral movement, a rock-shaft carried by the door and having at its opposite ends hooks, and catches with which the said hooks are adapted to engage supported by the said wall, the said catches being set out from the face of the wall, whereby when the rock-shaft is moved to cause the engagement of its hooks with the said catches, the door is forced inward toward the face of the wall, substantially as set forth.

5. The combination with a wall having a suitable doorway therein and having lock counterparts on each side of said doorway, and a suspended sliding door capable of a limited lateral movement while retaining its vertical position, of a horizontal rock-shaft suitably journaled to said door which is provided with a crank mediate its length, hooks on the ends thereof adapted to engage said counterparts, a vertically-movable link engaging said crank, and lever connected to and actuating said link and means for locking said lever when it alines with said link.

6. The combination with a wall having a suitable doorway therein and having lock counterparts on each side of said doorway, and a suspended sliding door capable of a limited lateral movement while retaining its vertical position, of a horizontal rock-shaft suitably journaled to said door which is provided with a crank mediate its length, hooks on the ends thereof adapted to engage said counterparts, a vertically-movable link engaging said crank, and lever connected to and actuating said link and automatic means for locking said lever when it alines with said link.

7. A device for locking a sliding door, comprising a horizontal rock-shaft suitably jour-

naled to said door and provided with a crank mediate its length, hooks on the ends thereof, a link engaging said crank, a lever connected to and actuating said link a segmental frame extending transversely through a guide-opening in said lever, and a longitudinally-reciprocal bolt adapted to shoot through said segmental frame when said lever alines with said link.

8. A device for locking a sliding door, comprising a horizontal rock-shaft suitably journaled to said door and provided with a crank mediate its length, hooks on the ends thereof, a link engaging said crank, a lever connected to and actuating said link, a segmental frame extending transversely through a guide-opening in said lever, and a longitudinally-reciprocal bolt having a transverse opening there-through adapted to shoot through said segmental frame when said lever alines with said link.

9. A locking device for a sliding door comprising a horizontally-disposed rock-shaft suitably journaled to said door which is provided with a crank mediate its length, and with hooks on the ends thereof, a vertically-movable link engaging said crank, a lever connected to and actuating said link, the arm of the lever to which the link is connected being arranged to be in alinement therewith when the parts are turned into locking position and a bolt for locking said lever when it alines with said link.

10. The combination with a suspended sliding door capable of a limited lateral movement, of a horizontal rock-shaft consisting of a continuous stretch of metal bar or rod, the ends of which extend beyond the sides of said door, and are bent so as to make an outward detour to form arms, and then bent back to form hooks on the side of the rock-shaft opposite the arms, and devices for operating said rock-shaft.

11. The combination with a suspended sliding door capable of a limited lateral movement, of a horizontal rock-shaft consisting of a continuous stretch of metal bar or rod, which is bent mediate its ends to form a crank and the ends of which extend beyond the sides of said door and are bent to make an outward detour to form arms, and are then bent back to form hooks on the side of the rock-shaft opposite from the arms, and devices for operating said rock-shaft.

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Witnesses:

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