

No. 844,251.

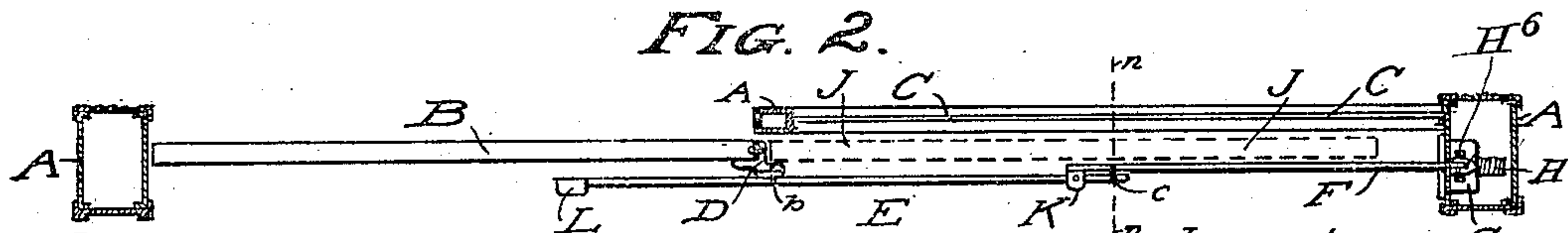
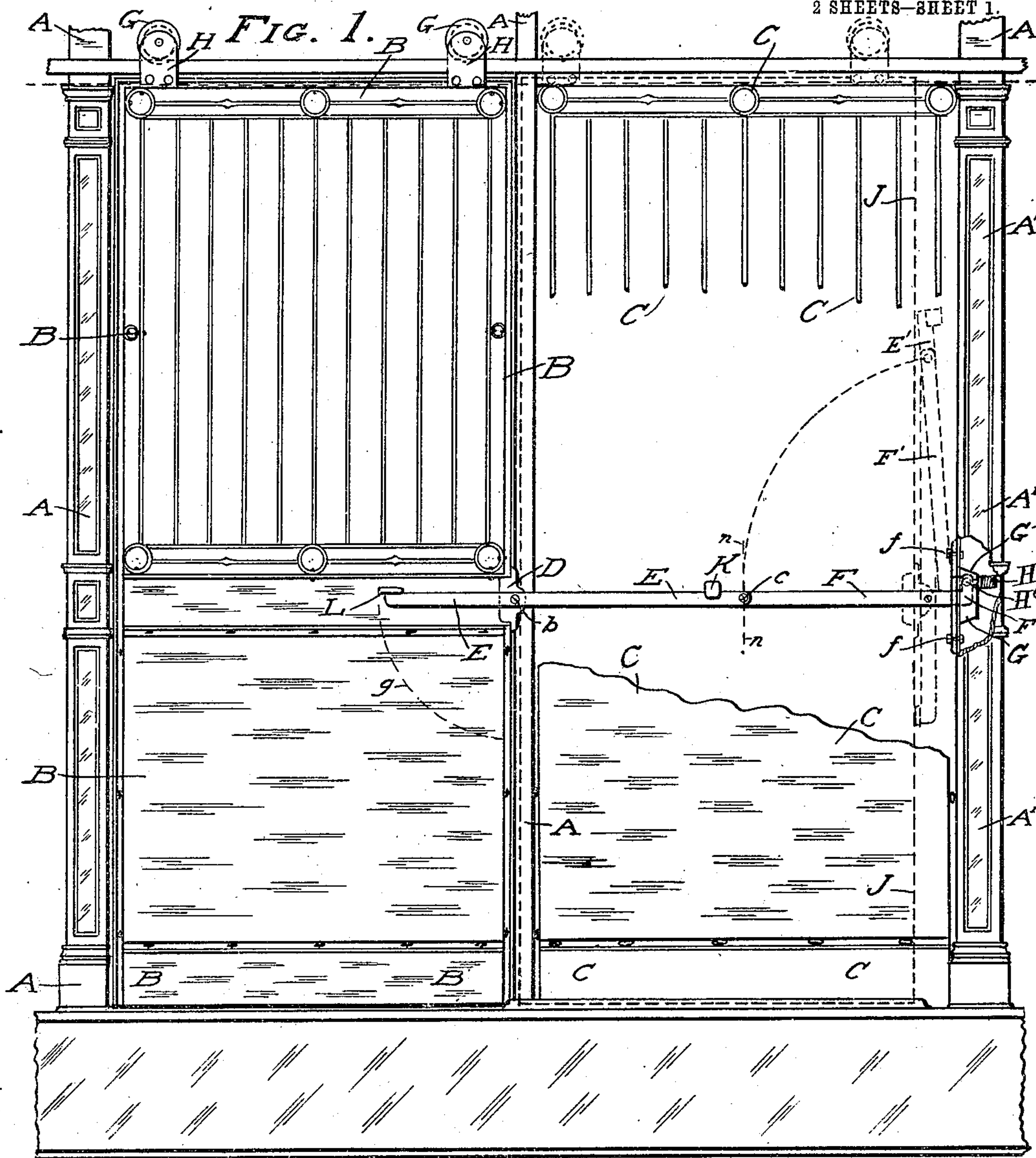
PATENTED FEB. 12, 1907.

J. F. CONNELL.

DEVICE FOR OPENING, CLOSING, AND LOCKING SLIDING DOORS.

APPLICATION FILED APR. 2, 1906.

2 SHEETS—SHEET 1.



Witnesses;
Reni Berry
Ida M. Daskam

Inventor, *G*
John Francis Connell
By *J. F.* *John Day*
Attorney.

No. 844,251.

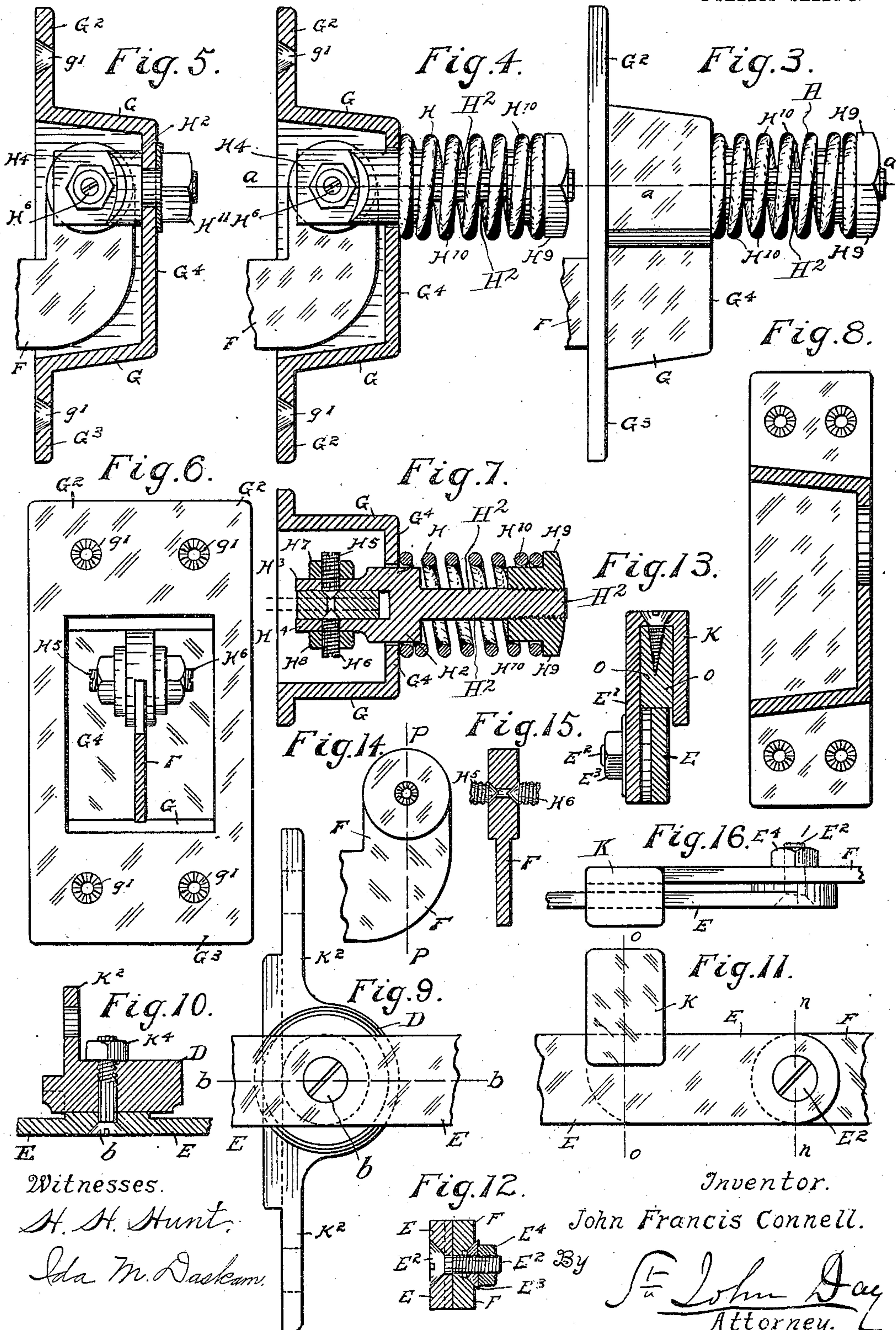
PATENTED FEB. 12, 1907.

J. F. CONNELL.

DEVICE FOR OPENING, CLOSING, AND LOCKING SLIDING DOORS.

APPLICATION FILED APR. 2, 1906.

2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

JOHN FRANCIS CONNELL, OF LOS ANGELES, CALIFORNIA.

DEVICE FOR OPENING, CLOSING, AND LOCKING SLIDING DOORS.

No. 844,251.

Specification of Letters Patent.

Patented Feb. 12, 1907.

Application filed April 2, 1906. Serial No. 309,503.

To all whom it may concern:

Be it known that I, JOHN FRANCIS CONNELL, of the city of Los Angeles, in the county of Los Angeles, in the State of California, have invented certain new and useful Improvements in Devices for Opening, Closing, and Locking Doors, (my said device being more especially applicable to the doors of elevator-shafts and other inclosures,) of which the following is a full, clear, and exact description or specification, reference being had to the accompanying drawings, and to the letters and figures marked thereon.

In Letters Patent previously granted to me, the said John Francis Connell, numbered 760,780, dated May 24, 1904, the device comprised under the Letters Patent has its operative parts connected together by means of bolts or rivets and pivotal connections, which, as shown in the drawings and described in the specification of the aforesaid Letters Patent, are not either capable of adjustment or adapted for taking up any slackness in the joints of said parts, which from time to time naturally results from practical wear and tear in the use of the device, nor is there provision in the operating-lever and link of the said device for maintaining the operating-lever and link rigidly stiff and horizontal by interlocking of the said lever and the link when the lever and link are in the horizontal position.

My present improvement has for its object to provide adjustable pivotal connections for the aforesaid movable link and lever and their connections, by which their mobility is capable of adjustment corresponding with the wear and tear of the joints themselves, also to provide an interlocking of the said lever and link, so that they are maintained rigidly stiff and keep the door locked when the lever and link are horizontal.

My invention has also for its object to enable the adjacent edge of the sliding door in the elevator inclosure to be brought much nearer to the corner of the inclosure, whereinto and toward which corner the door slides when the door is opened than is possible by or with the spring connection projecting from the corner of the inclosure and of the kind described in the specification and shown in the drawings of my aforesaid Letters Patent.

Upon the annexed drawings, Figure 1 is an elevation of a portion of one side of the interior of an elevator inclosure at the part where

one of the opening and closing doors, corresponding to one of the floors of a building, is situated and in which one sliding member is used. Fig. 2 is a plan corresponding to Fig. 1. Fig. 3 is a side elevation, upon a larger scale, showing the spring device whereby the opening, closing, and locking link and lever parts of the device are elastically connected to that part of the elevator inclosure adjacent to which the door becomes situated when the said door is open. Fig. 4 is a vertical section corresponding to Fig. 3. Fig. 5 is a section corresponding to Figs. 3 and 4 in all respects excepting that the spiral spring is dispensed with. Fig. 6 is a front elevation of the box on a scale corresponding to Figs. 3, 4, and 5, showing the opening therein and the lever partly in elevation and partly in vertical section, also the attachment and adjusting device of the lever within the box. Fig. 7 is a horizontal section upon the line *a a*, Figs. 3 and 4. Fig. 8 is a vertical section of the box, but wherein the lugs for fastening it to the columns or grillwork of the elevator inclosure are shown at one side of the box instead of in the front thereof, as in Figs. 3, 4, 5, 6, and 7. Fig. 9 is an enlarged view of the block, which is connected to one edge of the sliding door and on which the manually-operated lever of the device is pivoted. Fig. 10 is a horizontal section on the line *b b*, Fig. 9. Fig. 11 is an elevation, on the same enlarged scale as Fig. 9, of the projection of the link, which holds an india-rubber pad which presses on the lever when the opening and closing device is in the straight horizontal position. Fig. 12 is a vertical section on the line *n n*, Figs. 1, 2, and 11, showing the construction of the joint at that part, whereby tightening and adjusted working thereof is easily effected when any wear or tear thereof has taken place. Fig. 13 is a transverse section on the line *o o*, Fig. 11. Fig. 14 is a side elevation of that end of the link of the opening and closing device which connects with the box of the apparatus fastened into the framing or grillwork of the elevator inclosure. Fig. 15 is a transverse section on the line *p p*, Fig. 14, showing the ends of the screws each entering into the countersunk hole at each side of this fastened part of the link. Fig. 16 is a plan corresponding to Fig. 11.

In Figs. 1 and 2 the main framing of the elevator inclosure is marked A, the sliding

door B, and the fixed panel and grillwork of the opposite half of the elevator inclosure, upon the inner face of which the door B is situated when opened, is marked C. Upon the door B and at a height convenient to the hand of the elevator cage or car attendant there is attached the pivot-carrying block D, and to this block the lever E is movably fastened by the pivot *b*. The opposite end of the lever E is connected movably by the pivot *c* to the link F, the outer end of which link F is connected by the conically-pointed screws H^5 and H^6 to the bolt H^2 , contained within the box G, which is fastened by bolts f to the interior of the column A' , forming part of the elevator inclosure, and all as shown at Figs. 1 and 2. The connection of the bolt H^2 to the box G is a spring or elastic connection, the springiness or elasticity thereof being brought about by means of a coiled spiral spring H, through which the shank of the bolt H^2 passes, as more particularly shown in the enlarged views of this part of my apparatus at Figs. 3, 4, and 7. The outer end of the bolt H^2 is constructed with a screw-thread thereon, and upon this screw-thread the corresponding screw-nut is carried, which upon being tightened compresses the spiral spring H to the extent necessary to hold the bolt H^2 and the link F connected thereto with the requisite degree of rigidity in the box G, while at the same time allowing the spring H to yield whenever the door B is moved into the open position. The link F, as shown at Figs. 1 and 2, while being movable on the pivot *c*, is extended to a sufficient distance beyond the pivot *c* to constitute a stop which maintains the link F and lever E as a rigid horizontal bar when the link F and lever E are in the horizontal position. (Shown at Figs. 1 and 2.) The locking is effected by the outwardly-projecting stop K of the link F in its downward motion coming into contact with the upper edge of the lever E, as shown in Figs. 1 and 2. The stop K being fitted with a pad of india-rubber or other analogous elastic material O, Fig. 13, takes up by reason of its elasticity any blow which may occur on the lowering of the link F and lever E into the horizontal or locked position. The outer end of the lever E is formed with the thumb and finger piece L for the convenient application of the thumb and finger when raising or lowering the lever E in the act of opening or closing the door B.

As shown enlarged to about its actual size at Figs. 3 and 4, the spring attachment whereby the lever F in Figs. 1 and 2 is attached elastically to the framing or grillwork of an elevator inclosure consists of the box G, formed with an upper and lower projection G^2 and G^3 , respectively, through which holes g' are made for the passing of bolts or screws for securely connecting the box G

with the framing or grillwork of the elevator inclosure. Through the rear or back of this box (marked G^4 in Figs. 3, 4, and 6) an opening is made through which the head portion of the bolt H^2 passes, as more particularly shown in section in Fig. 4. The head, or that portion of this bolt H^2 which is situated within the hollow of the box G, is constructed as having two eyepieces H^3 and H^4 , respectively, as particularly shown at Figs. 6 and 7, between which the end of the lever F is situated and held in place therein by the two conically-pointed screws H^5 and H^6 , which pass through these screwed holes in the eyepieces H^3 and H^4 . The conically-pointed screws H^5 and H^6 have a screw-driver slot cut into the outer extremity of each, so that a screw-driver having its screw-turning member at the side of the shank of the screw-driver can be passed into either side of the box G and inserted into the slot of either screw H^5 and H^6 for the purpose of turning the screw in the eyepieces H^3 and H^4 until the proper adjustment of the conical points of the screws H^5 and H^6 within the corresponding conical holes in the end of the lever F is brought about, so as to insure steady, smooth, and non-shaking operation of the lever F upon the pivots constituted of the conical points of the screws H^5 and H^6 . Upon each of the screws H^5 and H^6 a lock-nut H^7 and H^8 , respectively, is carried, so that after the screws H^5 and H^6 have been properly adjusted they are maintained in their adjusted positions by applying a wrench to tighten the two lock-nuts H^7 and H^8 . The outer end of the bolt H^2 has a screw-thread cut upon it, and upon this screw-thread the nut H^9 is carried. A spiral spring H^{10} is also carried on that part of the bolt H^2 situated between the box G and the nut H^9 , and by tightening the nut H^9 to any required extent the compression of the spring H^{10} is effected, so as to operate elastically when the act of opening or closing the door (shown at Figs. 1 and 2 of the drawings) is terminated, thus cushioning any blow, percussion, or jar which may take place on the termination of either of these movements of the doors. Instead, however, of using the spiral spring H^{10} for the purpose of cushioning the blow due to the opening or closing of the elevator-inclosure doors the cushion effect may sometimes be dispensed with. As shown at Fig. 5, wherein the bolt H^2 has a shorter shank than in Figs. 3 and 4 and is rigidly held in the rear part G^4 of the box G^5 by the screw-nut H^9 .

When the box G^5 cannot be conveniently attached to the framing or grillwork of the elevator inclosure by means of the upper and lower projections G^2 and G^3 at the front of the box G, as shown in Figs. 7, 8, and 9, then corresponding lugs are or may be placed at one of the lateral faces of the box G, as

shown in Fig. 8, in which case the screws or bolts are passed through holes in these lateral lugs instead of through the holes g' and g' . (Shown in Fig. 6.)

5 As shown by the larger views, Figs. 9 and 10, the front end of the lever E in Figs. 1 and 2 is attached to the block B at the edge of the elevator-door by means of a screw K^3 , having a conical head, as shown more especially in section in Fig. 10. The shank of this screw K^3 is passed into the corresponding screw-hole in the part K^2 and has a lock-nut K^4 at the inner end thereof. The object of placing the screw K^3 with conical head and lock-nut K^4 to retain the lever E at this point of connection of the lever E with the elevator-door is to enable adjustment thereof to be made and retained when any looseness of the lever E about the bolt b may take place by wear or tear, in which condition any looseness due to this wear and tear is removed by turning the screw K^3 by applying a screw-driver in the slot of the head thereof and tightening the nut K^4 correspondingly.

25 The outer end of the link F at Fig. 11 not only shows the container K, having its india rubber cushion, as in contact with the upper edge of the lever E when the opening and closing and locking device is in the horizontal position, but it also shows the outer end of the joint by which the lever E is connected to the link F, as shown at Figs. 1 and 2. A section of this joint on the line $n n$ is shown at Fig. 12, wherein the part marked E corresponds to the part marked E in Fig. 11, and the part marked F in Fig. 12 corresponds to the part marked F in Figs. 1 and 2. A washer E' is situated between the parts E and F at this joint, so that the lever E and link F do not touch each other, but are kept apart by the washer E' . Through the lever E and link F and the washer E' is a circular hole through which the screw E^2 is passed. It will be noticed that the screw E^2 is constructed with a conical head and that a conical washer E^3 is in the link F. By tightening the screw E^2 into the tapped hole in the washer E^3 the conical head of the screw E^2 and conical edge of the washer E^3 are drawn tightly together, so that the link and lever, respectively, are capable of being adjusted to any required degree of accurate fitting and movement together. For the purpose of maintaining the screw E^2 , the washer E^3 , the lever E, and link F in proper operative relationship a lock-nut E^4 is applied to the outer end of the screw E^2 , by which arrangement the operative parts of the joints are capable at all times of being

maintained in complete working condition 60 without looseness, shake, or noise.

I claim as my invention—

1. The device for opening, closing and locking, elevator-doors, consisting of the combination of a single sliding door, a lever 65 pivoted at the edge of said sliding door and movably connected to a link whose outer end is bent upward and pivotally connected to a holder fastened to the elevator inclosure in such manner that the sliding door is enabled 70 when open to approximate closely to the connection of the outer end of the link with the elevator inclosure, the link having a rearward extension beyond its connection with the operating-lever, the extension of said 75 link having a stop projecting upward from its rearward end, said stop containing an elastic body for engaging with the upper edge of the operating-lever, so as to lock the sliding door, the operating-lever, the movable link and the elevator inclosure when said lever and link are horizontal, substantially as hereinbefore described.

2. The device for opening, closing and locking, elevator-doors, consisting of the 85 combination of a single sliding door, a lever pivoted at the edge of said sliding door and movably connected to a link whose outer end is bent upward and pivotally connected to a holder fastened to the elevator inclosure in such manner that the sliding door is enabled 90 when open to approximate closely to the connection of the outer end of the link with the elevator inclosure, the link having a rearward extension beyond its connection 95 with the operating-lever, the extension of said link having a stop projecting upward from its rearward end, said stop containing an elastic body for engaging with the upper edge of the operating-lever so as to lock the 100 sliding door, the operating-lever, the movable link when said lever and link are horizontal, the pivotal connection of the operating-lever with the sliding door, the connection of the outer end of the operating-lever with the link and the pivotal connection of the outer end of the link with the elevator inclosure being all adjustable, substantially as hereinbefore described.

In testimony whereof I, the said JOHN FRANCIS CONNELL, have hereunto set my hand and seal, in the presence of two subscribing witnesses, at Los Angeles aforesaid.

JOHN FRANCIS CONNELL. [L. s.]

Witnesses:

ST. JOHN DAY,
IDA M. DASKAM.