

(No Model.)

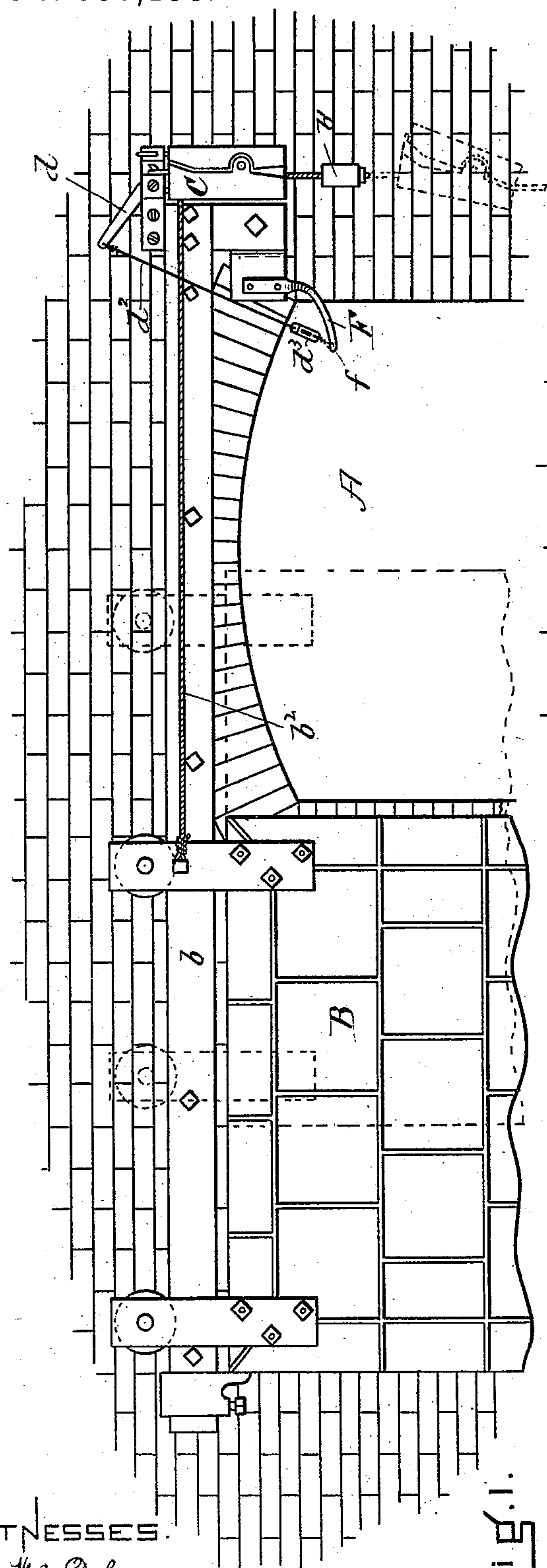
3 Sheets—Sheet 1.

H. T. MOODY.

APPARATUS FOR OPERATING DOORS.

No. 556,158.

Patented Mar. 10, 1896.

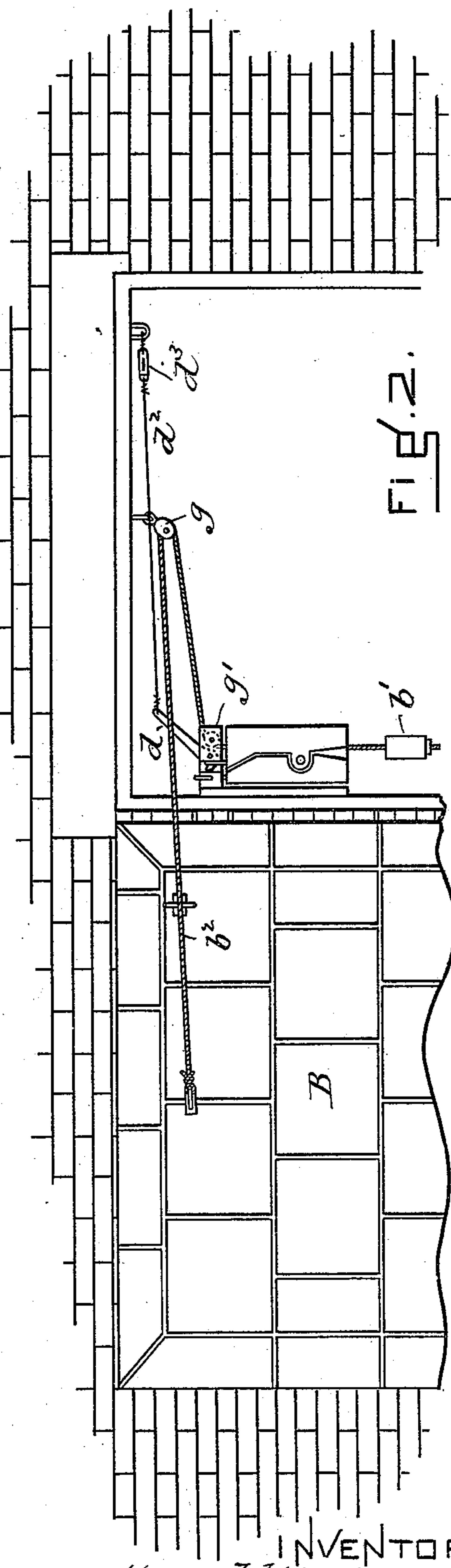


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WITNESSES.

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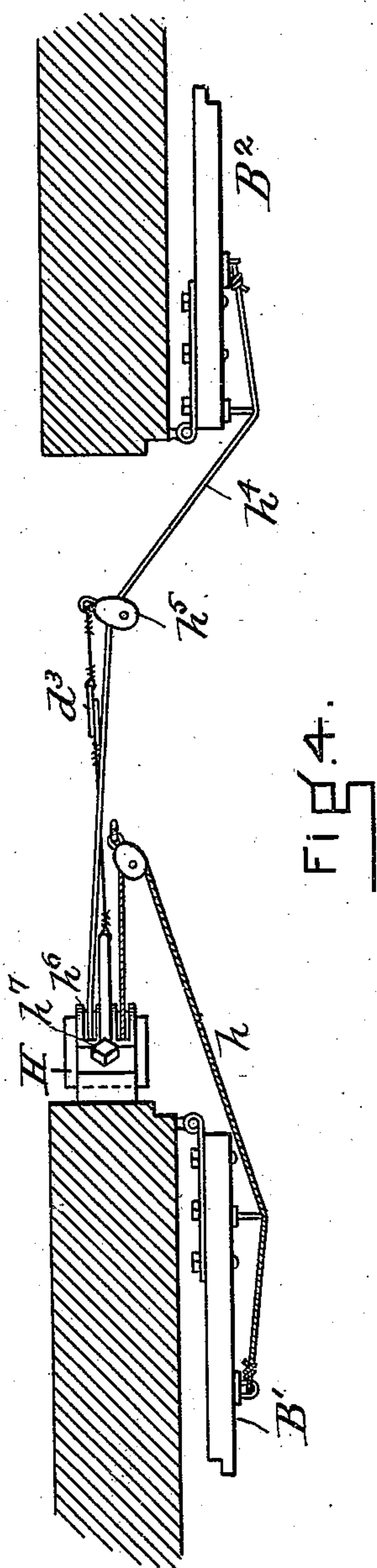
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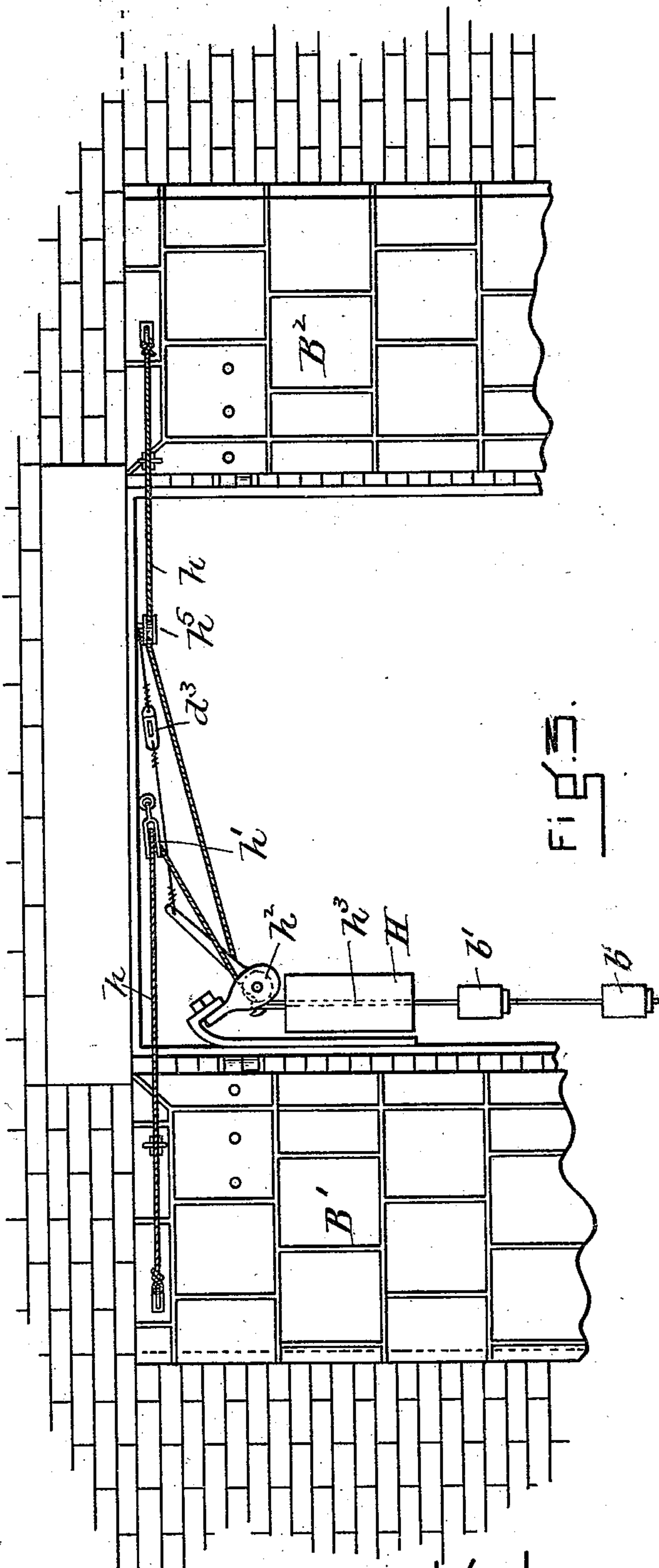
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(No Model.)

3 Sheets—Sheet 3.

H. T. MOODY.
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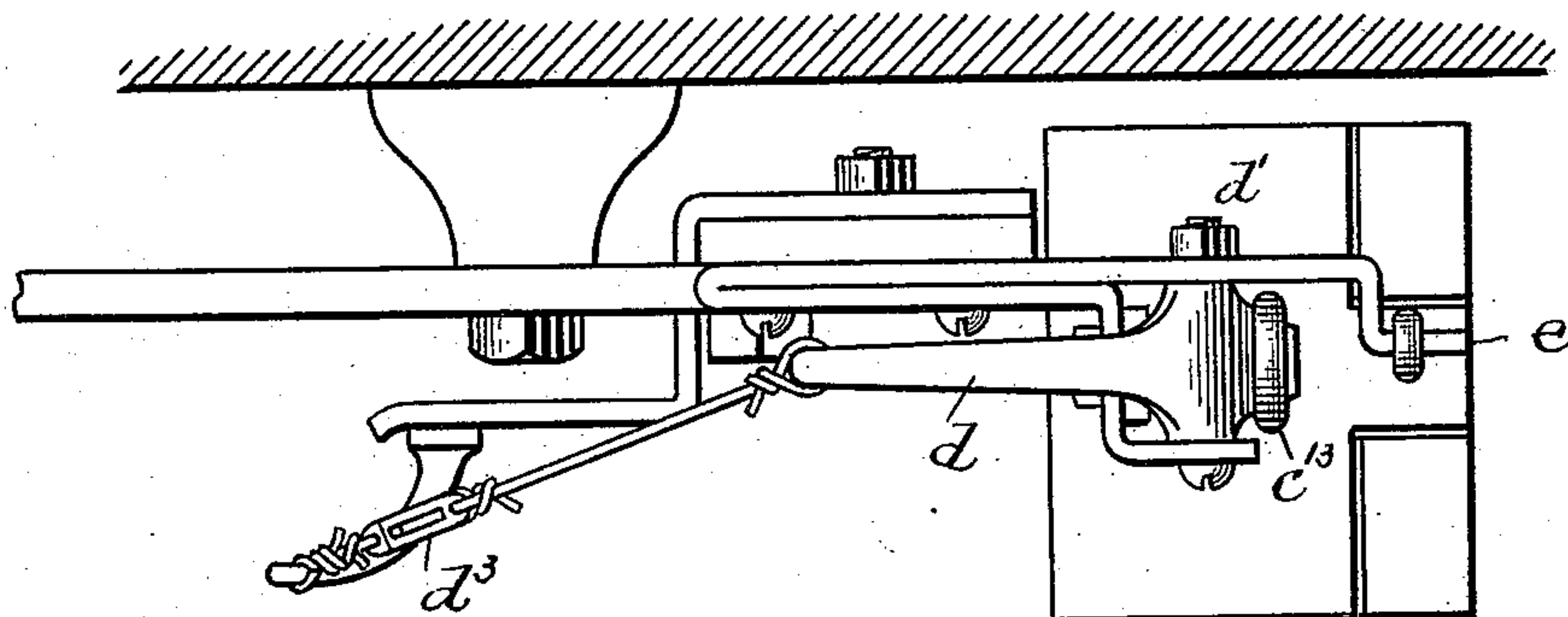


Fig. 5.

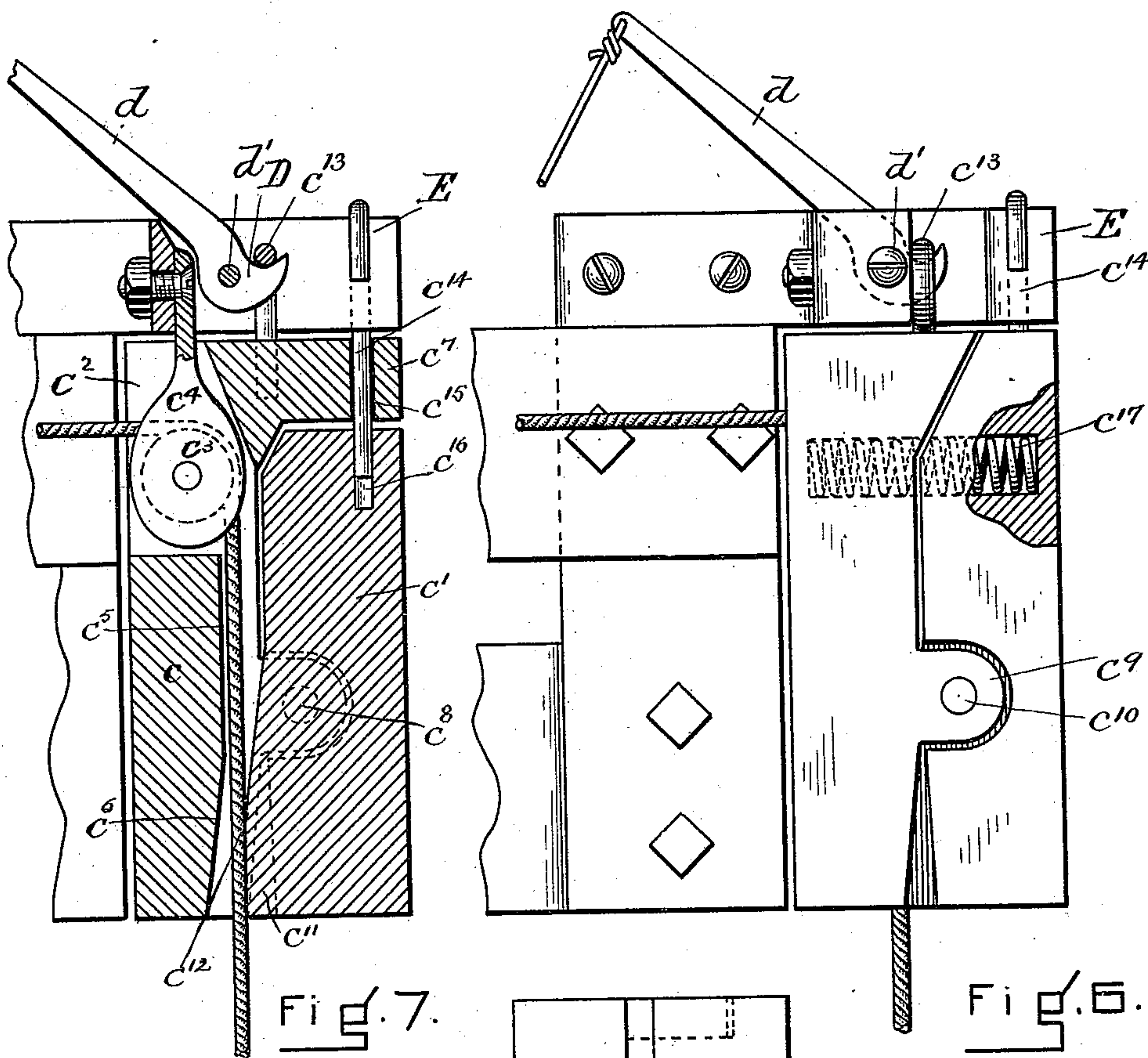
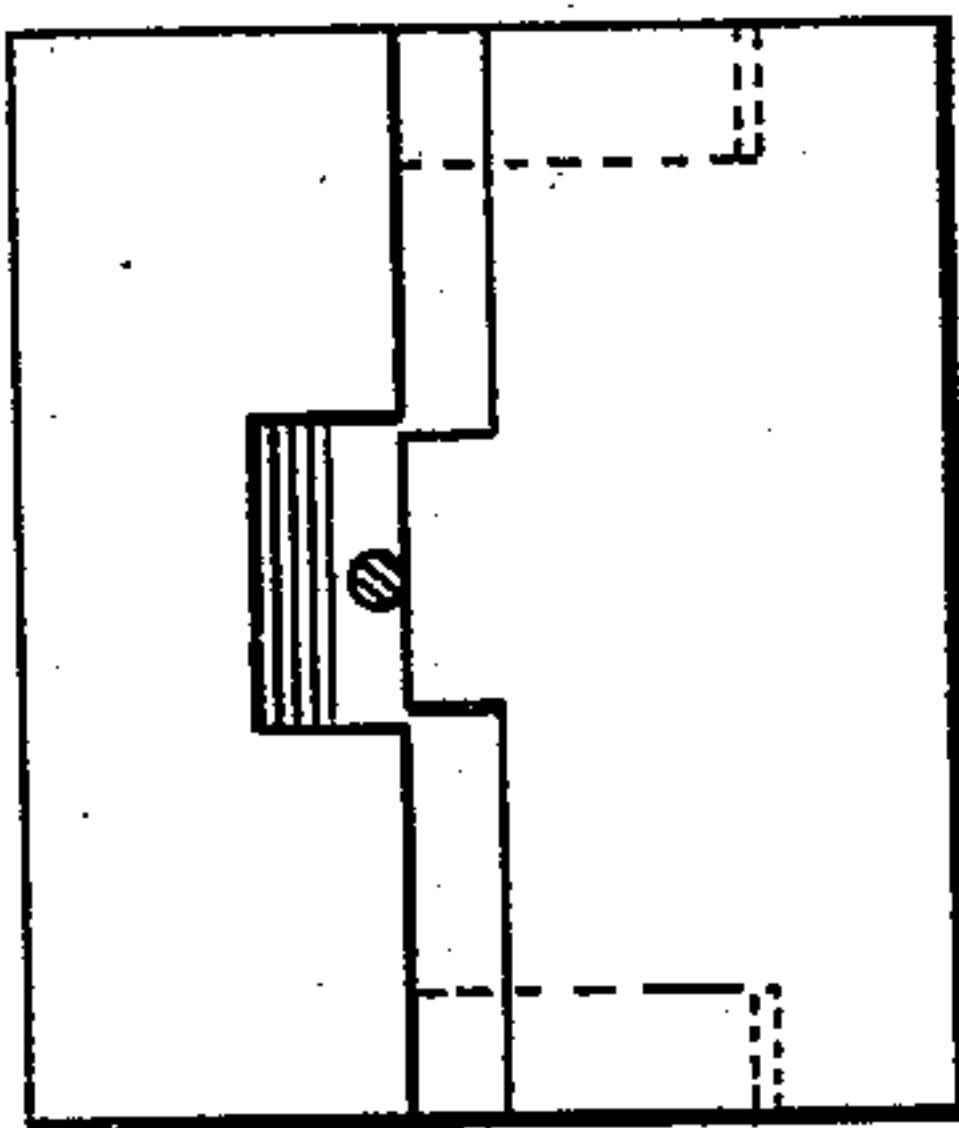


Fig. 7.

Fig. 6.

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UNITED STATES PATENT OFFICE.

HENRY T. MOODY, OF NEWBURYPORT, MASSACHUSETTS, ASSIGNOR TO THE
VICTOR MANUFACTURING COMPANY, OF SAME PLACE.

APPARATUS FOR OPERATING DOORS.

SPECIFICATION forming part of Letters Patent No. 556,158, dated March 10, 1896.

Application filed March 30, 1895. Serial No. 543,804. (No model.)

To all whom it may concern:

Be it known that I, HENRY T. MOODY, a citizen of the United States, residing at Newburyport, in the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Apparatus for Operating Doors, Shutters, and Similar Devices, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention is especially adapted for use in connection with doors or shutters adapted to be closed automatically in case of fire, but at all other times to be used in the ordinary way, and it is represented as applied to both sliding and swinging doors.

In the drawings, Figure 1 is a view of a part of a doorway and of a portion of a sliding door for opening and closing the same and of the means for closing the door in case of fire. Fig. 2 is a view representing substantially the same parts, with the exception that the door is represented as swinging instead of sliding. Fig. 3 represents the application of the invention to double doors of the swinging type. Fig. 4 is a view in section upon the dotted line, Fig. 3, and in plan of parts below said line. Fig. 5 is a view in plan, Fig. 6 in side elevation, Fig. 7 in section, and Fig. 8 an inverted plan, of an operating-weight, to which reference is hereinafter made. Figs. 5, 6, and 7 also show portions of the operating mechanism of the invention.

A is a doorway. B is its door. It may be arranged to slide upon a track, in which case it preferably is suspended from rolls which run upon it, (see Fig. 1;) or it may be hinged at one side of the doorway to swing across it and away from it, as represented in Fig. 2; or, as shown in Fig. 3, two hinged door-sections are shown, one hinged at each side of the doorway. Whichever form of door is used, the mechanism for closing it is practically the same in each case, with the exception that it is somewhat modified when used for closing two doors, for reasons which are hereinafter given.

The doors are not of the self-closing type,

and remain in any position to which they may be moved, and for closing them automatically in case of need a weight is released, which, acting through a cord or flexible connection, overcomes the inertia of the door and draws or swings it to a closed position and holds it closed. For starting and closing large doors, as well as holding them closed, it is desirable to use a relatively heavy weight. It will be understood, however, that this weight is normally and ordinarily held in a suspended position and has nothing to do with the ordinary movements of the door, and is only released in case of the emergency created by a fire; but as it is then necessary to have some connection between the weight and the door there is attached to a part of the door a cord or chain of a suitable kind to run through the suspended weight, which cord has at its free end a relatively light weight *b'*, which acts to keep the cord or chain taut while it is being released by the closing of the door, or while it is being drawn upon in the opening of the door. This weight acts principally to take up slack in the cord or chain, although it may also be used as a stop, as will be hereinafter explained.

Where the door is a large or heavy one the inertia to be overcome is considerable, and it is desirable that the weight should take immediate hold of the operating cord or chain and not drop to the bottom or end of the cord or chain before making an actuating engagement therewith. This is desirable, because it subjects the apparatus to no strain and permits the weight to begin to act to close the door the instant it is released, and it permits a greater freedom in respect to the position to which the door may be left open, because its operation is the same whether the door is partly or wide open, which, however, is not the case where the weight is permitted to drop and come up on the enlarged end formed by the weight *b'*, as would happen if the door were only part open instead of entirely open, it being obvious that the farther the door is from being wide open the greater the distance between the weight and the end of the draw cord or chain and the more disastrous or rack-

ing the drop of the weight would be, not only in the preliminary strain arising from the first shock of the blow, but also from the force with which the door would be closed, due to the excess of power thus caused by the rapid falling of so great a weight; and I have overcome this trouble by causing the weight to be so constructed that upon its release it immediately grips the cord or chain and begins to act to draw upon and close the door. I have illustrated this part of my invention as carried into effect by the weight C. It is made in sections c c' , the section c having a cavity c^2 of a size to receive a pulley, sheave, or roll c^3 and its housing c^4 , which is suspended from a suitable stationary support and over which the draw chain or cord b^2 extends and about which it turns to run downward through the way or recess c^5 in the section c of the weight, the said way or recess having near its lower end the inclined face or surface c^6 . (See Fig. 7.) The part c of the weight also has the overhanging section c^7 at its upper end to overhang the part c' of the weight. This part is pivoted to the part c at c^8 , the part c having ears c^9 on each side, between which a section of the part c' extends, and a pivot c^{10} passing through the ears and said part. This pivotal point preferably is somewhat below the center of the part c' , and the part c' has at its lower end the tongue c^{11} , which has the inclined face c^{12} , and which partly enters the way c^5 opposite the inclined wall c^6 . Ordinarily, or when the weight is at rest, the cord or chain is free to render or play through the way c^5 of the weight, the weight being suspended by a bail or eye c^{13} , attached to the part c to project from its upper surface, which is engaged by a hook or holder D, and the part c' is held from clamping the cord or chain by being held in a vertical position, or so that the tongue c^{11} does not clamp the chain or push it against the wall c^6 . This result is accomplished by means of a stud or pin c^{14} , supported by the rail E, or in any other suitable way. It is represented in Figs. 5 and 7 as in the form of a hook to hook upon the end e of the rail, which is bent outward from the main section of the rail and then to a position to receive it, the stud extending through a hole c^{15} in the overhanging section c^7 of the part c into a hole c^{16} in the part c' —that is, it serves as a plug or latch for holding the part c' in required relation to the part c while the weight is at rest, and it is so held that upon the release of the weight and the slight dropping thereof the part c' becomes disengaged from the part c by drawing away from the stud or plug, when one or more springs c^{17} , held in cavities or suitable recesses in the two parts c c' , (see Fig. 6,) and also held compressed while the weight is at rest and when the parts are in the position represented in Fig. 7, will act to separate the parts c c' at their upper ends and close them together at their lower ends and upon the cord or chain.

The weight also acts as a clamp or clutch, and to this end it may be said to have a clamping or clutching jaw or device which, upon the release of the weight, is automatically actuated to engage the chain or cord and thus secure the weight to the chain or cord, so that it thereafter moves with the chain or cord to the end of its movement and without moving thereon, at least to any appreciable or hurtful extent. The weight is automatically released in case of fire by releasing the hook D, the hook being at the end of a long lever d pivoted at d' to the rail or other suitable support, and secured in a position to hold the weight by a cord or chain d^2 extending from the end of the lever d to the fusible link d^3 attached closely to the end f of a bracket F attached to some stationary support, such as a depending arm from the rail, or otherwise secured to the wall in close proximity to the doorway and so that its end extends into the doorway. This form of bracket I prefer to use with the construction represented in Fig. 1, as this brings the fusible link into best operative relation to the doorway. The lever d is pivoted at one side of the bail or eye c^{13} and is so shaped that upon its release by the fusing of the holding-link it immediately flies over and unhooks the weight.

The operation of hanging the weight upon the lever and of adjusting the stud or plug c^{14} to hold open the jaw or part c' takes place of course only when the device is originally erected or after a fire.

The apparatus for closing the hinged door is substantially the same as above described, although it may be arranged as represented in Fig. 2, where the weight, instead of being supported at the side of the doorway, is represented as supported in the doorway, in which case the draw cord or chain passes over a pulley g located near the center of the doorway and at the top thereof and then back over a sheave carried by a bracket g' fastened to the side of the door-casing, to which bracket the lever-hook and pin for holding the weight are also secured. The lever-hook is connected with the fusible link d^3 by a cord or chain extending across the doorway and the fusible link is secured in the doorway to a staple.

Where double doors are used each door may be equipped with a weight of the character specified for closing it; but as a rule it is possible to use weights which do not grip or clutch the chain or cord, and it then becomes convenient to employ a single weight for closing both doors and cause it to act upon one slightly in advance of its action upon the other. In Figs. 3 and 4 I have represented my invention as so applied. Each door has a separate or distinct draw cord or chain. The door B' has a draw cord or chain h , which passes about a pulley h' over a roll or sheave h^2 and through a hole h^3 in the weight II, the weight being suspended by a hook-lever like the one already described,

which engages a bail or eye extending from the upper surface of the weight and which also is held by a fusible link b^3 and connecting cord or chain. The release of the link permits the lever to release the weight. The door B^2 is connected with the weight by the cord or chain h^4 , which passes about a roll or pulley h^5 to a sheave h^6 and thence through a second hole h^7 in the weight H. The door which has the rabbet in its front edge into which the overlapping section of the other extends is the one which it is desired to move and close first. B' is this door in Figs. 3 and 4, and its cord or chain h is so arranged that its end which has a slack-removing weight b' is held nearer the operating-weight when both doors are wide open than the corresponding slack-weight at the end of the cord or chain h^4 , and upon the release of the weight H in the case of fire it drops and comes first in contact with the weight b' at the end of the cord h and thus communicates motion to the cord and by it to the door B' , and continuing its downward movement it then comes in contact with the end of the cord h^4 , and a closing movement is then communicated to the door B^2 , and these movements continue until the doors B' B^2 are closed in successive order and held closed by the weight.

It will be seen that with this organization a lighter weight may be employed, and its successive contacts with the two ends of the draw cords or chains somewhat break the force of its fall.

It will also be seen that one weight serves to close both doors, and a single fusible link only is necessary for controlling the closing of both doors.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In an apparatus for automatically closing doors, shutters, &c., in case of fire, the combination of a door or shutter, a chain or cord attached to it to be movable therewith extending over a pulley and having at its free end a weight b' for removing slack from the cord, a weight for closing the door normally held stationary by means of a bail or eye upon the weight, and a lever having a hook end pivoted to the casing or other stationary support, the hook end being the short end and engaging the bail or eye, and the other or long end of the lever being connected with a fusible link by means of a cord or chain; the said fusible link and a bracket attached to the side of the doorway and bent or shaped to extend into the doorway or in front of it; the fusible link being immediately attached to the end of the bracket, as and for the purposes described.

2. In an apparatus for closing a door or shutter in case of fire, a draw cord or chain attached to the said door or shutter, and a door or shutter closing weight through which the draw cord or chain normally is free to run

and which weight is provided with chain or cord gripping or clamping devices which are set in operation or released upon the release of the weight, as and for the purposes described.

3. The combination of a door or shutter, a draw cord or chain, a weight having an aperture through which the draw cord or chain passes, means for normally holding the weight suspended, comprising a trip held by a fusible link and a connecting-cord and cord grasping or clamping mechanism contained in the weight and operative to grasp the cord or chain upon the release of the weight, as and for the purpose described.

4. The combination of the normally-stationary weight, the door or shutter, the draw cord or chain normally playing through the weight and means for automatically connecting the weight with the cord or chain in any position of the cord or chain in relation to the weight, as and for the purposes described.

5. The combination of the door or shutter, the cord or chain and the operating-weight normally stationary and having a hole or aperture through which the cord or chain passes, the said weight having a jaw which is held from contact with the rope or chain when the weight is stationary and which upon its movement is released and automatically closed upon the chain or rope, as and for the purposes described.

6. In combination with the draw cord or chain the weight C having the sheave-aperture c^2 , the rope-runway c^5 , the overhang c^7 and the bail or eye c^{13} , and the jaw c' pivoted at c^8 and having a tongue c^{11} to close upon the jaw or cord and force it against the incline c^6 and the jaw-latching pin c^{14} stationarily supported and extending through the overhang into the jaw c' , and the trip D, and the jaw-actuating spring c^{17} , and the stationary sheave c^3 and its housing contained in the recess c^2 , as and for the purposes described.

7. In an apparatus of the character specified, a door or shutter closing weight normally held stationary and having a rope or chain engaging device normally held out of operative position, and automatically actuated to engage the cord or chain upon the release of the weight, substantially as described.

8. The rope or chain weight having a jaw or surface against which the chain is adapted to be gripped or clamped, a gripping-jaw to clamp or grip the rope or chain against said surface, a spring for closing said jaw, and a latching device for holding the spring compressed and adapted to be actuated to release the spring automatically upon the automatic release of the weight.

9. The combination of a pair of hinged doors or shutters, a weight normally held stationary, a tripping device for so holding the weight, a fusible link in the door or window way connected with said tripping device and the parting of which releases it and permits the weight

to be dropped, and draw cords or chains passing from the doors respectively over pulleys or sheaves and through holes in said weight and slack-preventing weights or stops at the
5 ends of said cords, one of which weights or stops is at a higher level than the other, and whereby the doors are adapted to be closed,

one slightly in advance of the other, substantially as described.

HENRY T. MOODY.

In presence of—

G. W. LANGDON,
J. C. M. BAYLEY.