No. 848,761. PATENTED APR. 2, 1907.

H. T. MOODY.

SELF CLOSING DOOR OR SHUTTER.

APPLICATION FILED NOV. 5, 1906.

3 SHEETS—SHEET 1.

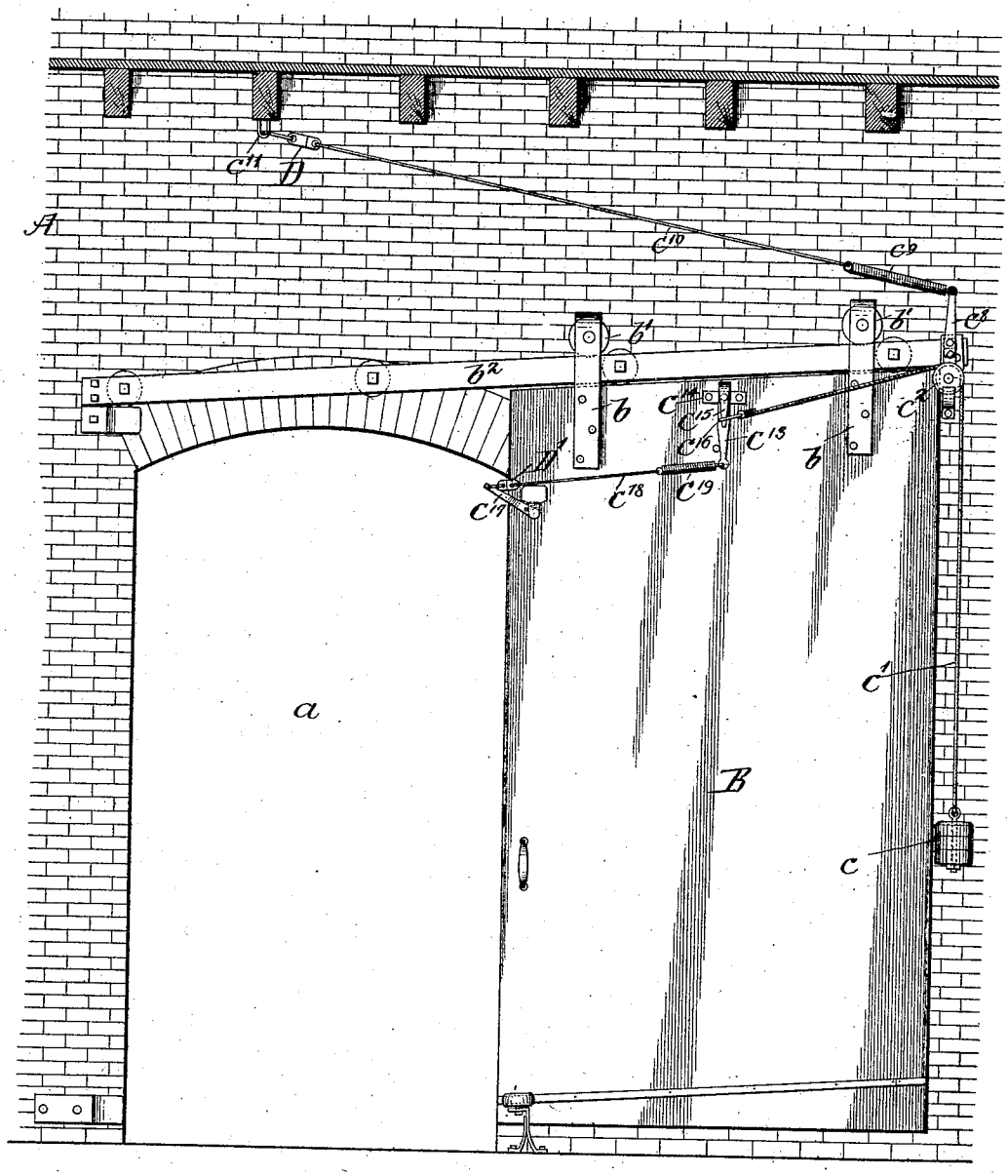

Fig. 1.

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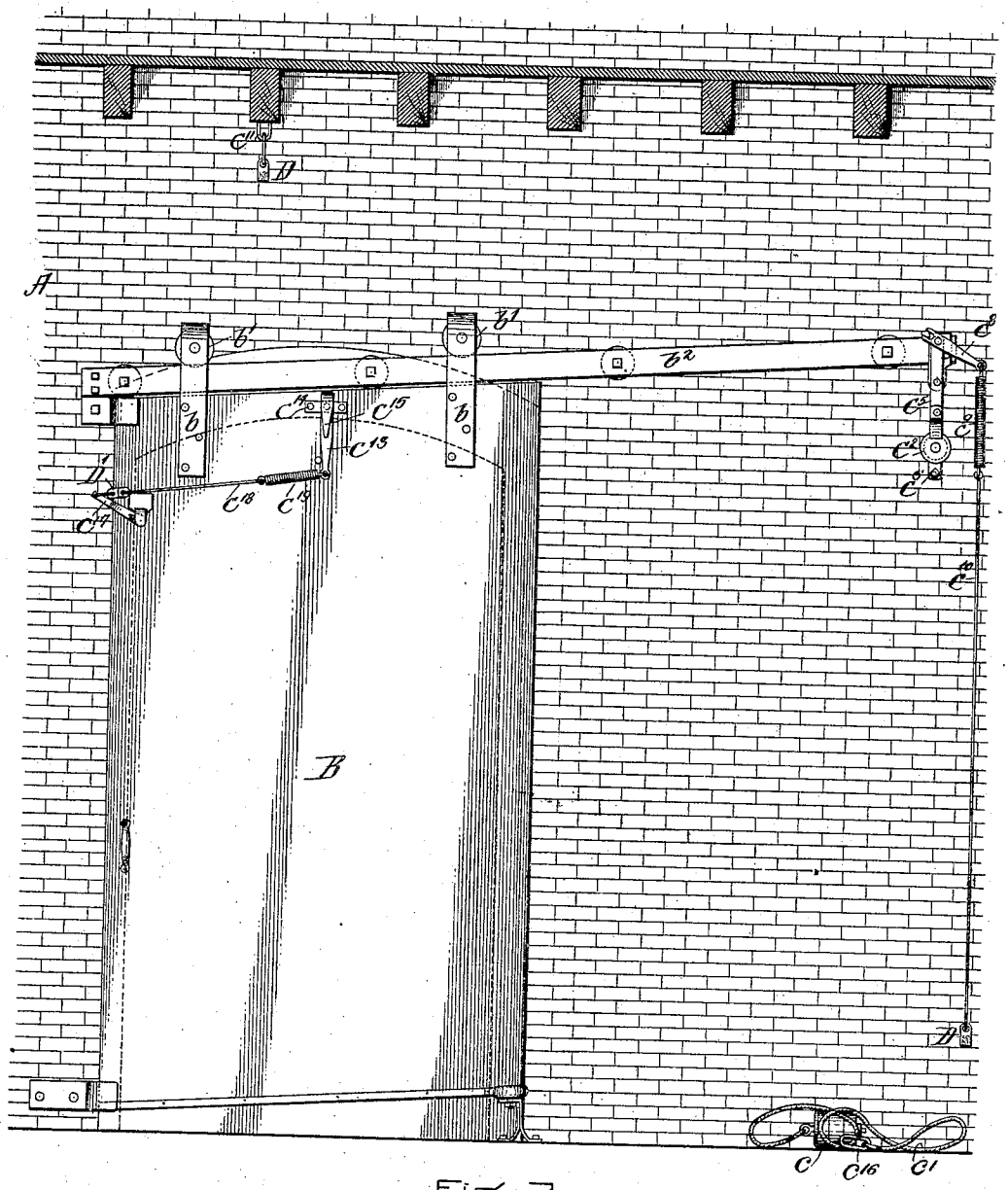

FIG. 2.

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3 SHEETS—SHEET 3.

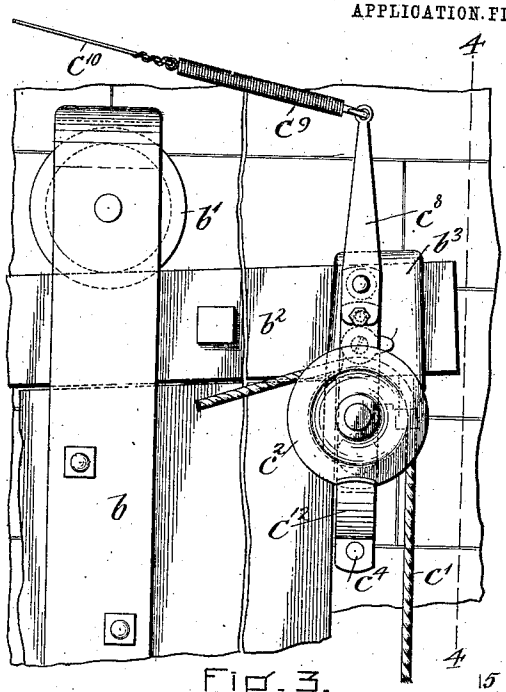

Fig. 3.

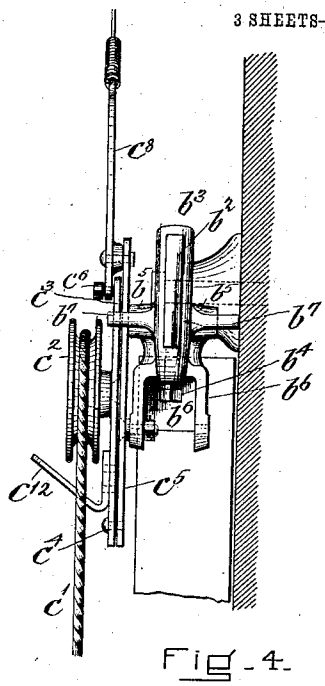

Fig. 4.

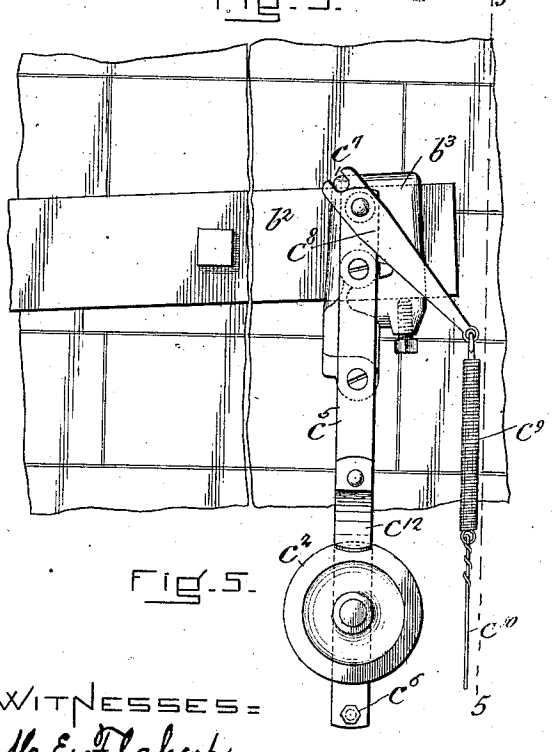

Fig. 5.

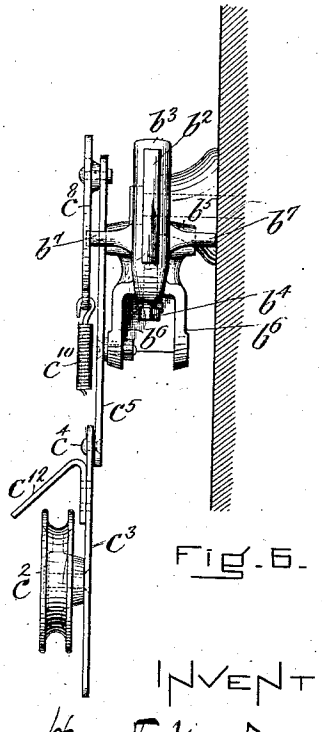

Fig. 6.

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UNITED STATES PATENT OFFICE.

HENRY T. MOODY, OF NEWBURYPORT, MASSACHUSETTS, ASSIGNOR TO VICTOR MANUFACTURING COMPANY, OF NEWBURYPORT, MASSACHUSETTS, A COPARTNERSHIP.

SELF-CLOSING DOOR OR SHUTTER.

No. 848,761. Specification of Letters Patent. Patented April 2, 1907.

Application filed November 5, 1906. Serial No. 342,000.

To all whom it may concern:

Be it known that I, HENRY T. MOODY, of Newburyport, in the county of Essex and State of Massachusetts, a citizen of the United States, have invented a new and useful Improvement in Self-Closing Doors or Shutters, 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.

My invention relates to that type of self-closing door or shutter which is provided with a balancing-weight or other means by which the door or shutter is held open or partially open.

The object of my invention is to provide means by which the balanced door or shutter may automatically be released to close in case a fire occurs in any one or more of different parts of the building in which the door or shutter is located.

My invention can best be seen by reference to the drawings, in which—

Figure 1 shows in side elevation the door or shutter provided with the improved apparatus. Fig. 2 illustrates in side elevation the door or shutter in closed position, with the apparatus disconnected or released therefrom. Fig. 3 shows in side elevation an enlarged detail of the apparatus, to which special reference will hereinafter be made. Fig. 4 shows a section on the line 4 4 of Fig. 3. Fig. 5 illustrates in side elevation a portion of the apparatus in a disconnected or released position. To this, also, special reference will hereinafter be made. Fig. 6 shows a section on the line 6 6 of Fig. 5.

In the drawings, A represents a portion of a wall or partition having therein an opening *a*, which is closed by a fire door or shutter B. This fire door or shutter, by means of the hangers *b*, carrying rolls or wheels *b'*, is arranged to run upon the inclined track b^2, secured to the wall or partition. By means of the inclination of this track the door or shutter running along the same is adapted to gravitate to and maintain a normally closed position. The door or shutter is held open or partially open by means of a balancing-weight *c*, hanging pendent from a rope *c'*, which renders over a pulley c^2 and connects with the door or shutter. As may be noted by reference to Figs. 3 and 4, where this portion of the apparatus is shown in enlarged detail the pulley c^2 is fixed to the side of a pulley-supporting arm c^3. This arm at one end is pivoted, by means of a pin c^4, to a supporting-fixture c^5. This fixture is shown consisting simply of a bar, and I prefer that it shall be affixed to the sleeve b^3, which is attached to the track b^2 by means of a set-screw b^4. I prefer that the supporting-fixture c^5 should be thus secured for the reason that the sleeve is an element commonly employed with the track upon which the door or shutter slides, being adapted, in part, to act as a stop for defining the amount to which the door or shutter may open. It therefore provides a very convenient element to which the pulley-support may be secured. By using the sleeve as a supporting-fixture also the parts may be assembled in the shop, and all that is necessary to do in setting up this portion of the apparatus is to place the sleeve upon the track, when the pulley will be in a properly-operative position. There is then no need of any auxiliary parts or fittings.

The supporting-bar c^5 is secured to the sleeve, preferably by fastening it to a lug b^5, extending from the side of the sleeve, and by also fastening it to the flange b^6 depending from the sleeve. In this connection it is to be noted that the sleeve has lugs b^5 extending from either side thereof, and there are also two flanges b^6 dependent from the sleeve. Two sets of lugs and flanges are provided in order that the support carrying the pulley may be secured to either side of the sleeve, thereby providing for a right or left door or shutter—in other words, a door or shutter which may roll from the right or left of the doorway.

As was before described, the pulley-supporting arm c^3 is pivoted to the supporting-fixture c^5, by which the pulley is allowed to assume different relative positions, one of which is its usual or normal position, in which the rope or cord supporting the balancing-weight passes over the same, the other position being one in which the rope becomes released therefrom. I have so provided that the pulley will assume a position where the weight-carrying rope is released therefrom by gravity. The pulley accordingly is maintained in the following manner. Projecting

from the side of the arm c^3 is a pin c^6. Engaging with this pin by means of a slot c^7 therein is a lever c^8, which is pivoted to the supporting-bar c^5. The arrangement of this lever is such that when held in an engaging position it will hold the pulley-supporting arm in proper position for the pulley to receive the weight-supporting rope. The lever is held in an engaging position in part by a stop b^7, which projects from the side of the sleeve b^3 and against which the pulley-supporting arm is adapted to bear, preventing further movement of the arm and lever in one direction. Connecting also with the lever and acting as a further means for holding it in an engaging position is a spring c^9, to which is secured a wire c^{10}, which may run through the building in which the door or shutter is located or to any point of fixture c^{11}. The wire and spring thus connecting with the arm of the lever operate to draw it to and maintain it in an engaging position. Of course the spring c^9 might be dispensed with; but I prefer to use it for the reason that any slack in the wire is taken up and the lever maintained in a more rigid or fixed position.

At one or more points in the wire c^{10} is a fusible link D, which is adapted to separate or break when overheated, by which the lever will become released, with the effect that it will fall from its operative position above mentioned and become disconnected from the pin upon the pulley-supporting arm. This arm being then unsupported will fall, turning upon its pivotal connection with the supporting-fixture above mentioned, and the pulley will fall with it, whereby the weight-supporting rope will become disconnected from the pulley and fall to the ground or floor.

In order to insure the rope being disconnected from the pulley, I have provided the pulley-supporting arm with a cast-off c^{12}. This cast-off is in the nature of a flange projecting out from the arm c^5 around the periphery of the pulley and which when the pulley has dropped into an inoperative position, or one like that shown in Figs. 5 and 6, acts to cast off the weight-carrying rope from the pulley.

Thus far I have described the means by which the weight-supporting rope may be released or cast off from the pulley over which it is rendering, whereupon the weight will fall to the ground or floor. Such casting off of the weight-supporting rope might under certain circumstances of construction release the door sufficiently to close, the door or shutter being released from the balancing-weight. I have provided, however, means by which the weight-supporting rope will be entirely disconnected from the door or shutter with which it makes connection at the same time that it is released or cast off from the pulley. As may be noted by reference to Fig. 1, there is pivotally secured to the side of the door or shutter an arm c^{13}. In practice I prefer to pivotally secure this arm to a cleat c^{14}, which is fastened to the side of the door or shutter. Fastened to this arm and moving pivotally therewith is a hook c^{15}. In practice I prefer to make the hook and arm integral. Engaging with this hook is a ring or other device c^{16} on the end of the weight-supporting rope, which ring when the arm c^{13} and hook secured to it are maintained in a proper engaging position will be held on the hook by the bearing stress of the weight on the end of the rope. When the rope becomes cast off or released from the pulley in the manner before described, this bearing stress will become relieved, and the ring or device c^{16} on the end of the rope will simply slip off the hook, and thereby become disconnected from the door or shutter, which will immediately close. The arm c^{13} and hook c^{15}, secured to it, are held in a proper engaging or operative position by means of a connection between the end of the arm c^{13} and an arm c^{17}, fastened to the door or shutter and projecting forward from the front edge thereof. This connection consists of a cord c^{18}, in which is a fusible link D′, the link being preferably so located that it will come in the doorway when the door is open. I prefer that the connection shall consist, in part, of a spring c^{19}, the tension of which will assist in holding the arm c^{13} in a proper engaging or operative position. I prefer also to attach to the door or shutter a stop c^{20} for positively defining the proper operative or engaging position of the arm and hook, the arm being held against this stop by the means before described. The advantage of this auxiliary construction is that the rope and weight will become released from the door by the breaking of the fusible link other than in the manner first described, for it is obvious that in case of fire in the vicinity of the door the link D′ in the doorway would break, whereupon the arm c^{13} would become released and it and the hook carried by it allowed to pivot or turn. Being then overcome by the stress of the balancing-weight the hook would turn to a point where the ring on the end of the weight-supporting rope would become cast off or slip from it, and thereby become disconnected from the door or shutter, which will thereupon close.

It would seem unnecessary to describe in any further particular the operation of the apparatus or device. It is sufficient to say that by it a balanced door or shutter may be released to close practically from any part of the building in which the fire may occur—that is, in any part of the building to which the connection including the element of a fusible link can be carried. The apparatus has also the advantage of two means of disconnection, in both of which the balancing means and rope supporting the weight, which

normally act to hold the door or shutter open, become absolutely disconnected from it.

It is very apparent that various changes in construction may be made without departing from the spirit of my invention. In this connection I would say that where I have used the term "rope" in this specification I would claim practically any means by which suitable connection could be obtained, such as a cord, wire, chain, or other instrumentality.

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

1. The combination with a self-closing fire door or shutter of a weight, a rope connecting with the door or shutter and supporting said weight, a pulley over which the rope renders, and means supporting said pulley whereby the position thereof may become changed and said rope released therefrom.

2. The combination with a self-closing fire door or shutter of a weight, a rope connecting with the door or shutter supporting said weight, a pulley over which the rope renders, a supporting-fixture for said pulley, means connecting said pulley with its support whereby it may gravitate from a position of engagement with said rope to a position where said rope is released from said pulley, and releasable means holding said pulley in its position of engagement as aforesaid.

3. The combination with a self-closing fire door or shutter, of a weight, a rope supporting said weight, a pulley over which the rope renders, means whereby said rope prevents the closing of said door and releasable means supporting said pulley whereby the release of the support may free the door from the control of the weight.

4. The combination with a self-closing fire door or shutter of a weight, a rope connecting with the door or shutter supporting said weight, a pulley over which the rope renders, an arm carrying said pulley, a fixture of support to which said arm is pivoted, a lever connecting with said arm adapted to hold said pulley-carrying arm in a position whereby said pulley may receive said rope, a stop for defining said position, releasable means including the element of a fusible link for holding said lever in an engaging position, and means secured to said pulley-carrying arm for casting off or releasing said rope from said pulley when said arm is released from its holding-lever, substantially as described.

5. The combination with a self-closing fire door or shutter, of a weight, a rope carrying said weight, a pulley over which the rope renders, a member pivotally fixed to the side of the door or shutter and with which member said rope makes detachable connection whereby it may be disconnected therefrom as said member is released to pivotally turn from an engaging position, means releasable when overheated for holding said member in an engaging position, and a stop for defining such position.

6. The combination with a self-closing fire door or shutter of a weight, a rope carrying said weight, a pulley over which the rope renders, an arm pivoted to the side of said door or shutter, a hook carried by said arm, means forming a detachable connection between said hook and the end of said weight-carrying rope and adapted to be released therefrom when said hook turns from an engaging position upon the pivotal turning of said arm, and means for holding said hook in engaging position comprising a connection including the element of a fusible link between said arm and said door or shutter.

7. The combination with a self-closing fire door or shutter, of a weight, a rope carrying said weight, a pulley over which the rope renders, means releasable when overheated by which said weight-carrying rope makes connection with the door or shutter, and independent means releasable when overheated whereby said rope may be released from said pulley.

8. The combination with a self-closing fire door or shutter, of a weight, a rope connecting with the door or shutter and supporting said weight, a pulley over which the rope renders, and means for detachably supporting said pulley in operative position to receive said rope whereby said pulley may become detached from its operative position as aforesaid and said rope become released therefrom.

HENRY T. MOODY.

Witnesses:
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HELEN M. MAGUIRE.