No. 777,300. PATENTED DEC. 13, 1904.

H. T. MOODY.

FIRE DOOR OR SHUTTER.

APPLICATION FILED APR. 7, 1904.

NO MODEL. 2 SHEETS—SHEET 1.

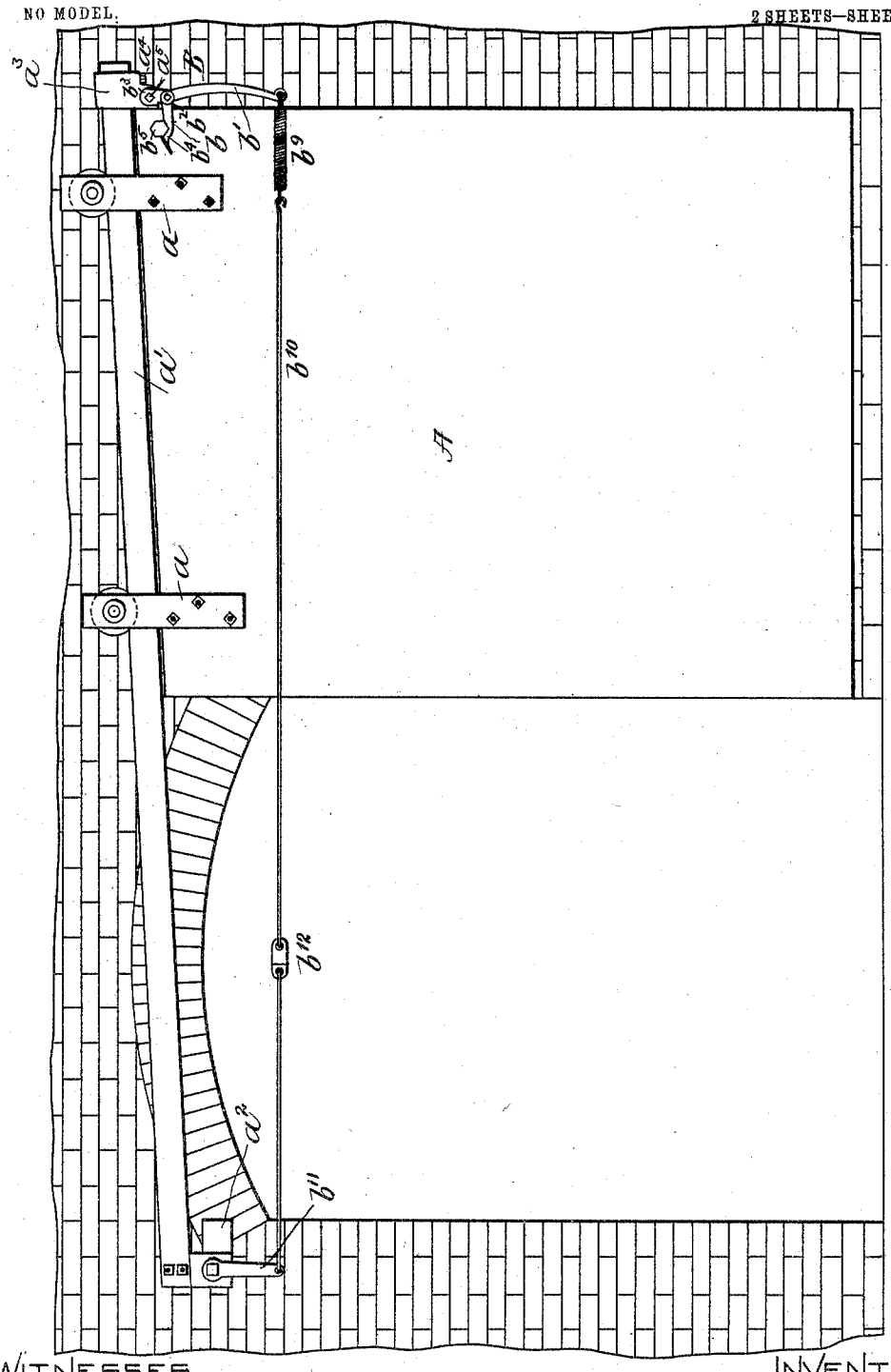


Fig. 1.

WITNESSES.
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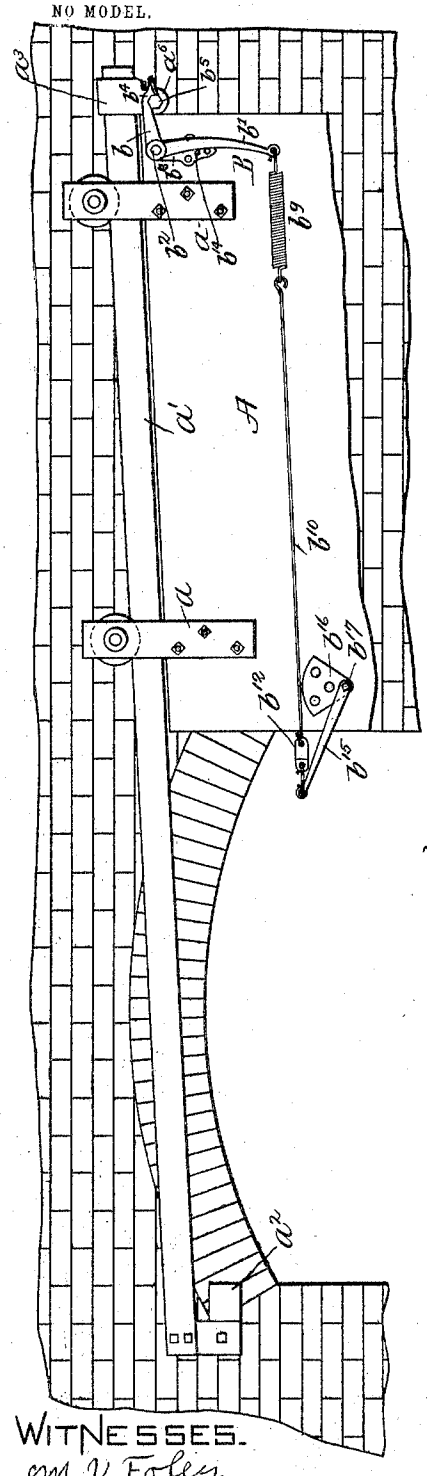


Fig. 4.

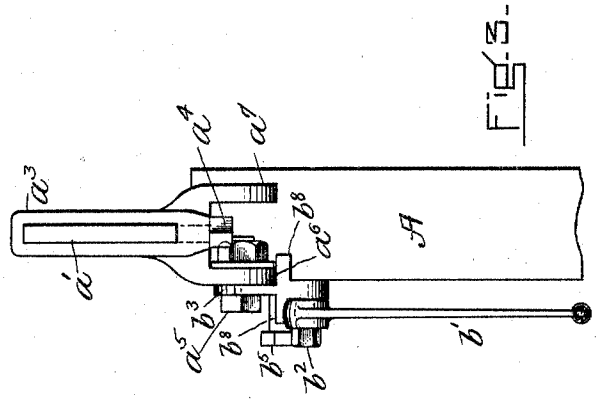


Fig. 3.

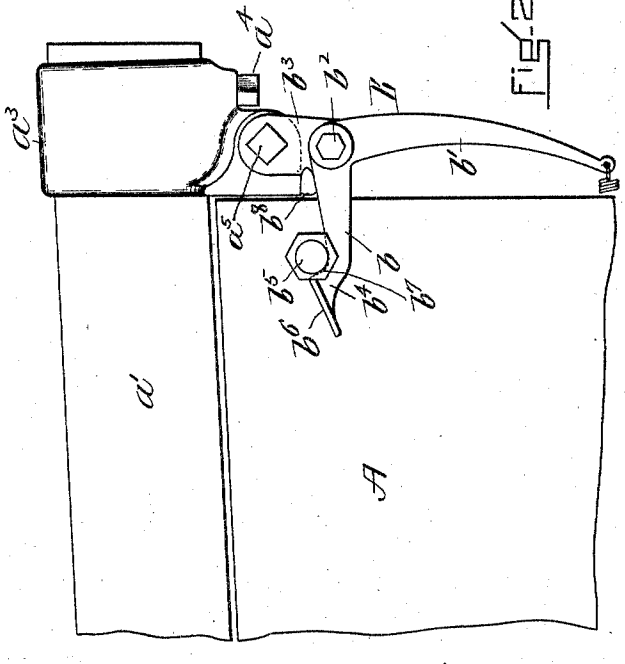


Fig. 2.

WITNESSES.

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UNITED STATES PATENT OFFICE.

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

FIRE DOOR OR SHUTTER.

SPECIFICATION forming part of Letters Patent No. 777,300, dated December 13, 1904.

Application filed April 7, 1904. Serial No. 202,089. (No model.)

To all whom it may concern:

Be it known that I, HENRY T. MOODY, a citizen of the United States, and a resident of Newburyport, in the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Fire 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.

The invention relates to a fire door or shutter hung or overbalanced to assume a normally closed position.

It consists in providing the door with an auxiliary attachment or device in the nature of an automatic catch, which is normally operated by the opening or shutting of the door, acting to retain or hold the door open and to become released to permit of its closure, and which catch, more essentially, is of such a character and so retained that it becomes inoperative in case of fire thermostatically by the breaking of a fusible link wherefore if the door be open it becomes automatically released to close.

Referring to the drawings, in which the attachment or device is shown in combination with a fire-door, Figure 1 shows the same in front elevation with my improved device. Figs. 2 and 3 show in front and rear elevation, respectively, a portion of the device in enlarged detail, to which part reference will hereinafter be made. Fig. 4 shows in front elevation a fire-door fitted with the improved device in slightly-modified arrangement. To this also special reference will hereinafter be made.

In the drawings, A represents a fire-door supported by hangers a upon an inclined track a'. The relative disposition of the track a' to the doorway is such that the fire-door will gravitate to a closed position, while the extension of the track is such that the door may be rolled back to a position where the doorway is left wide open. The means thus referred to for obtaining a self-closure of the fire-door is referred to merely for purposes of illustration as showing a common arrangement for obtaining a self-closure of a door or shutter. Any other expedient for obtaining such self-closure may of course be resorted to. At the forward end of the track-rail and preferably fixed thereto is a stop a^2, acting to define the closed position of the door. In the rear at the end of the track-rail is a back stop a^3, acting to define the limit of its opening. This back stop a^3, like the forward stop a^2, connects with the track-rail and takes the form of a cast sleeve arranged to slip upon the rail and be fixed thereto at any point of desired position by a screw a^4.

The fire-door A when rolled back or open is held automatically in the following manner: There is provided a lever B, having arms b b', angularly disposed. The lever B is pivoted by a pin b^2 to the stop a^3, or rather to the member b^3, secured by a bolt a^5 to said stop in a manner which will be hereinafter explained. The arm b of the lever relatively to the point of its pivotal turning is so disposed and of such extension that it will lap by the side of the door A when rolled back to an open position. On the forward end of the arm is formed a catch b^4, which when the door is rolled back and the lever B is in a normally operative position is adapted to frictionally engage with a fixed pin or other member b^5, projecting from the side of the door in line therewith, by which engagement the door is held back or open. The catch b^4 has a front beveled face b^6 and in the rear an inclined surface b^7, against which back surface of the catch the projecting member b^5 is adapted to frictionally bear when the door has been rolled fully open or to a position defined by the back stop a^3. The normally operative position of the lever is defined by the engagement of its arm b with a lug b^8, acting as a stop. The lug b^8 is shown projecting from the member b^3, to which the lever is pivoted. The lever is held in operative position under tension by means of a spring b^9, fixed at one end to the end of the lever-arm b' and its other end connecting by a flexible connection b^{10} across the doorway, with an arm b^{11} depending from the forward stop a^2. Within a portion of the flexible connection b^{10}, which extends across or comes within the doorway, is placed a fusible link

b^{12}. The link is preferably placed at about the center of the doorway at such point from its top that the link would be best exposed to heat passing through the same. The relative vertical disposition of the link obviously may be defined by the length of the arm b^{11}, to which the flexible connection b^{10}, containing the link, is secured.

In the operation of the device as the door is rolled back the member projecting from its side will be brought into frictional contact or engagement with the forward beveled face of the catch b^4 on the end of the lever-arm b. By such engagement the arm will be borne down, the lever turning at the point of its pivoting against the resisting tension of the spring b^9. This continues until the engaging member has cleared the beveled face of the catch, when the lever will be returned by the tension of the spring, the frictional engaging member then working down along the inclined rear surface of the catch, locking in back of the same and becoming fully locked in place at the time the door engages with its back stop a^3. The effect is that the door is held open against its normal tendency to gravitate back to a closed position.

The release of the door is accomplished simply by a light draw or pull upon it. The projecting member on the side of the door as it is drawn to simply acts to bear down the lever by drawing along the inclined rear surface of the catch on the end of the lever-arm, then along its beveled face until a release is obtained.

In case of fire the fusible link b^{12} melts by the heat, whereupon the flexible connection holding the spring b^9 is broken and its tension upon the lever is released. Thereupon the lever simply drops away, for, as said before, it is held in operative position by the tension-spring and flexible connection. If at such time the catch on the arm is holding the door, it will automatically become released by the dropping away of the lever-arm, and the door will automatically become released to gravitate back to a closed position.

Reference has already been made to the fact that the lever B is pivoted to a member b^3, connecting with the back stop a^3 of the door. This is done more especially for convenience as representing a more perfect type of construction. It is particularly desirable in a device of this kind that all the parts be made in the shop ready to be applied to the door or shutter without modifying its structure, without disfiguring it or its adjacent parts, and without the need of auxiliary parts or fittings. This is in part accomplished by adapting the parts of the device to be secured to the track-rail on which the door runs. Trouble, however, might still be experienced in so hanging or pivoting the lever B that the catch on the end of its arm may come in such lateral plane that it may engage with the member projecting from the side of the door. Doors, among other variations, vary in their thickness, some being much thicker than others. Then, again, they are hung differently—some, for example, roll from the right of the doorway and others from the left. On account of these variations the lever B is pivoted to the aforementioned member b^3, consisting of a flat piece having right and left lugs b^8, which, as said before, act as stops for defining the operative position of the lever B. The lever may be pivoted to either side of this member b^3 to engage with either one of its lugs or stops. The said member b^3, as before explained, is secured by a bolt a^5 to the back stop a^3 and by bolting it to either one of its right or left projecting flanges a^6 a^7. These flanges are of such projection that the member b^3 may be secured to either one of them on the right or left and from either side. It is mechanically obvious without further explanation that with such adjustable connection a proper lateral disposition of the lever B may be obtained that its catch may come into such relation with the side of the door as to engage with the projecting member thereon, and this, moreover, whatever may be the thickness of the door or whether it rolls across the doorway from the right or left.

In Fig. 4 I have shown the essential parts of my device in a slightly-modified reverse arrangement, operating, however, on the same principle as that before explained. Here the lever B is pivoted by the bolt b^2 to the side of the door, or rather to a bracket b^{13}, secured to it, which part corresponds substantially with the member b^3 in the previous construction. The arm b is of a length to extend from the point where the lever is pivoted beyond the rear edge of the door to a point where the catch b^4 upon the end of the lever-arm will engage with the fixed projecting member b^5 in line therewith when the door is rolled back to an open position. The projecting member b^5 is shown fixed to the back stop a^3. The normally operative position of the lever is defined by a lug b^{14} on the bracket b^{13}, acting as a stop to the lever-arm b', and the lever is held in a normally operative position under tension by the spring b^9, secured to it, the said spring connecting by a flexible connection b^{10} with an arm b^{15}, secured to the side of the door near its front edge by means of a cleat b^{16}, to which the arm is secured by a pin b^{17}. The arm b^{15} extends slightly beyond the front edge of the door, so that its end to which the flexible connection b^{10} is attached may come within the doorway when the door is open, as will also a portion of the connection itself, in which portion of the flexible connection is placed the fusible link b^{12}. In operation the device thus arranged is substantially like that before explained. The retention of the door is automatically obtained by the frictional engagement of the catch in

the end of the lever-arm, while its release is obtained by disengaging the catch simply by pulling or drawing the door to. In case of fire the fusible link b^{12} is melted, so releasing the lever from the retention of the spring and flexible connection. The lever then becomes inoperative, and its catch no longer held under tension against the projecting member with which it is in frictional engagement, and the door will simply draw away from said member and gravitate to a closed position. Under some circumstances this latter mode of arranging or constructing the device is the preferable one. As in the other construction the parts can be made complete in the shop and attached to the door or shutter without in any way modifying its structure and without the need of auxiliary parts or fittings. In view of possible variations in the structure and mode of hanging the door or shutter the projecting member b^5 may be made of such length that the catch on the end of the lever-arm will engage with it whatever the lateral position of the lever may be. Moreover, said member may be secured to either the right or left of the flanges a^6 a^7, projecting from the back stop a^3, depending upon the relative disposition of the door or shutter. The arm b^{15} also is secured to the bracket b^{16} by the pin b^{17}, preferably in such a manner that it may be swung in any direction before the bracket is secured to the door and the arm fixed in place. There is one advantage, however, in constructing the device as first described which will be noted, and this is that the flexible connection holding the lever in operative position may be capable of any indefinite extension before it is fixed, so that the fusible link within the flexible connection may be arranged at any point desired in the building. In the latter construction, where the cord is fixed to the arm connecting with the door, of course it is incapable of such extension.

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 pivoted member, a second member, one of said members being mounted upon the door and the other of said members being mounted upon the structure in which the door slides, said members being disposed to engage and interlock with one another when the door is in its open position and by so interlocking to retain the door in such position, and means positively maintaining said members in interlocking relation, said positive means including a fusible element.

2. The combination with a self-closing fire door or shutter of a member pivotally mounted to swing in a plane parallel to the plane in which the door moves, a second member, one of said members being mounted upon the door, the other of said members being mounted upon the structure in which the door moves, said members being disposed to engage one another upon the opening of the door, and means positively and yieldingly holding said members in interlocking relation, said holding means including a fusible element.

3. The combination with a self-closing fire door or shutter of a pivoted retaining member, means for yieldingly maintaining said pivoted member in a normal position, a second member for engagement with said pivoted member to retain the door open, one of said members being mounted to move with the door and the other of said members being mounted upon the structure in which the door moves, said members being disposed to contact upon movement of the door, whereupon said pivoted member is turned on its pivot from its normal position, said maintaining means then acting to return the same to the normal position and interlocking engagement with said second member.

4. The combination with a self-closing fire door or shutter of a pivoted retaining member, thermostatically-releasable means having fixed engagement with said pivoted member for yieldingly maintaining the same in a normal position, a second member for engagement with said pivoted member to retain the door open, one of said members being mounted to move with the door and the other of said members being mounted upon the structure in which the door moves, said members being disposed to contact upon movement of the door, whereupon said pivoted member is turned on its pivot from its normal position, said yielding means then acting to return the same to the normal position and into interlocking engagement with said second member.

5. The combination with a self-closing fire door or shutter of a pivoted lever having arms angularly arranged, a friction-catch b^4 forming a portion of one of the arms of said lever, a fixed member adapted when said pivoted lever is in an operative position and upon and by the opening of the door to have engagement with the friction-catch upon said lever-arm, by which engagement the door or shutter is held open, means for defining the said operative position of said lever, and tensional means, thermostatically releasable, for yieldingly holding the lever in said operative position, said means connecting at one end with the other arm of said lever and at its other end with some fixture of support beyond the forward edge of the door when open.

6. In a self-closing fire door or shutter, a pivoted lever having arms angularly arranged, means for pivotally mounting said lever upon the side of said door or shutter by which one of the lever-arms may extend beyond the rear edge of the door or shutter, a member fixed beyond the rear edge of said door or shutter when open, with which member said extending lever-arm upon and by the opening of the door is adapted to have engagement, when said

lever is in an operative position, means for defining the operative position of said lever, and tensional means, thermostatically releasable, for holding said lever in said operative position.

7. In a self-closing fire door or shutter, a pivoted lever having arms angularly arranged, means for pivotally mounting said lever upon the side of said door or shutter by which one arm of the lever may extend beyond the rear edge of the door or shutter, a member fixed beyond the rear edge of said door or shutter when open, with which said extending arm upon and by the opening of the door or shutter is adapted to have engagement, when said lever is in an operative position, and by which means said door or shutter is held open, a stop for defining the operative position of said lever, and tensional means, thermostatically releasable, for yieldingly holding said lever in said operative position, said means being in fixed connection and movable with the door.

HENRY T. MOODY.

In presence of—
ALVAH HOYT,
CHARLES A. STOCKMAN.