

914,817.

I. FILSON.
DOOR CONTROLLING DEVICE.
APPLICATION FILED FEB. 8, 1908.

Patented Mar. 9, 1909.
2 SHEETS—SHEET 1.

Fig. 1.

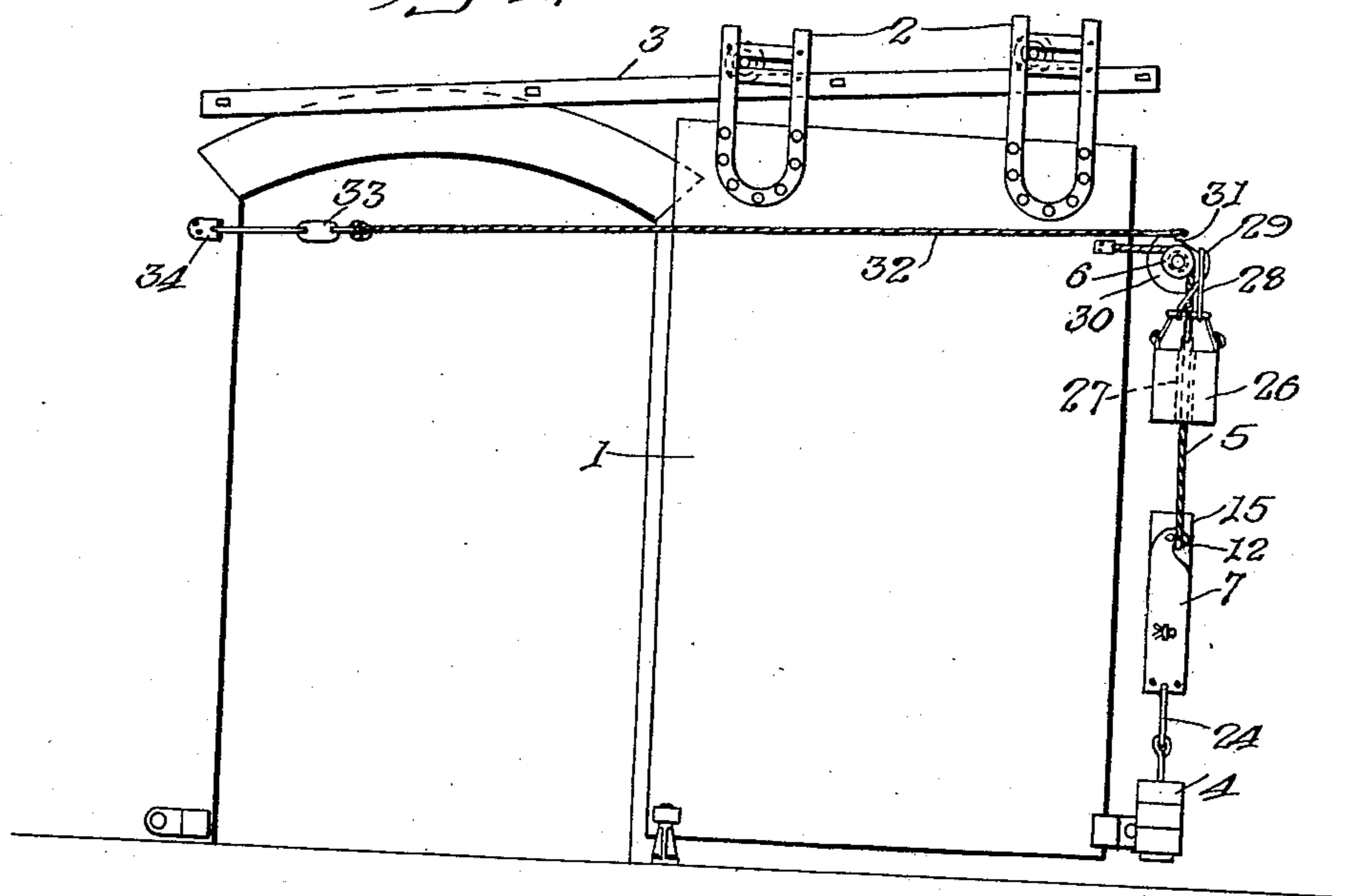
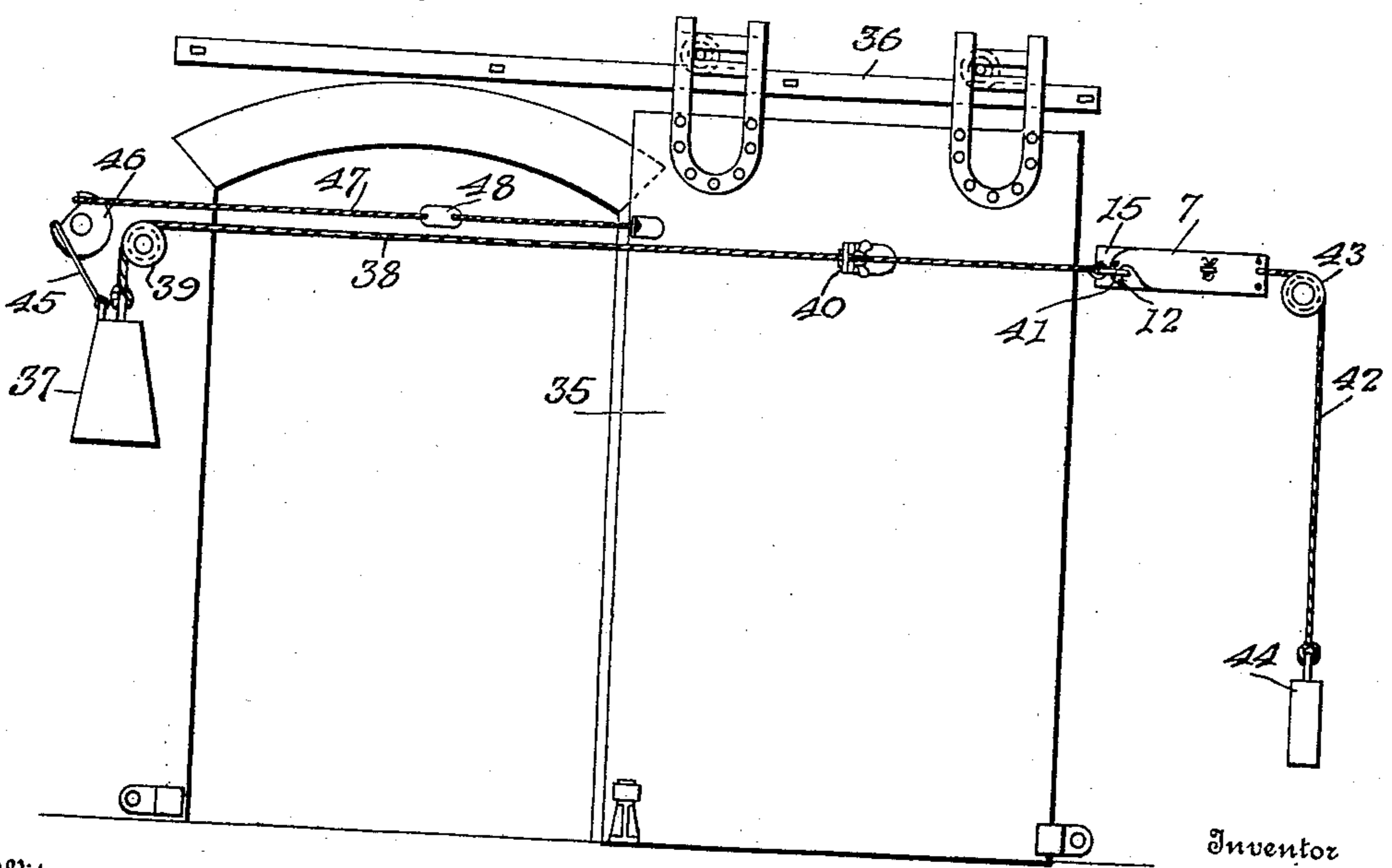


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

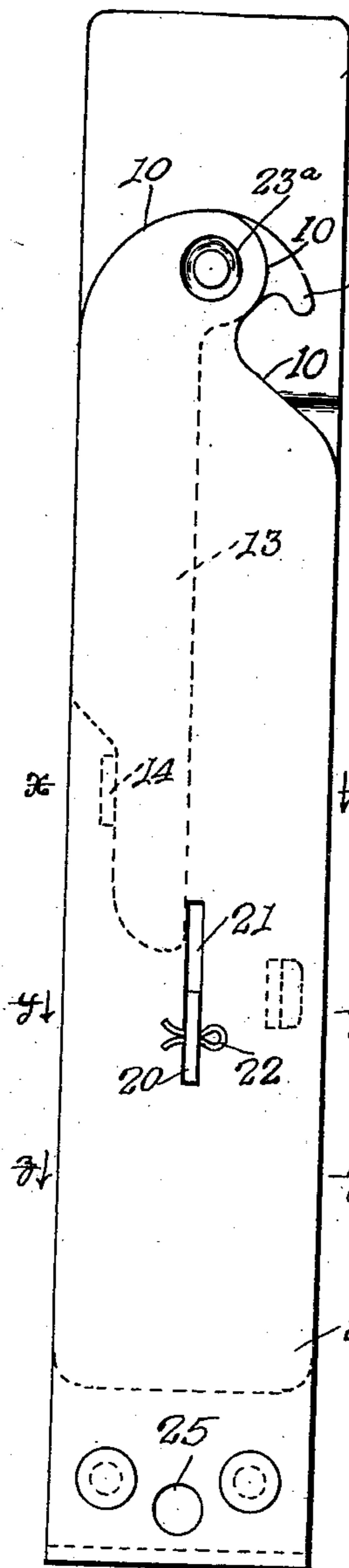


Fig. 4.

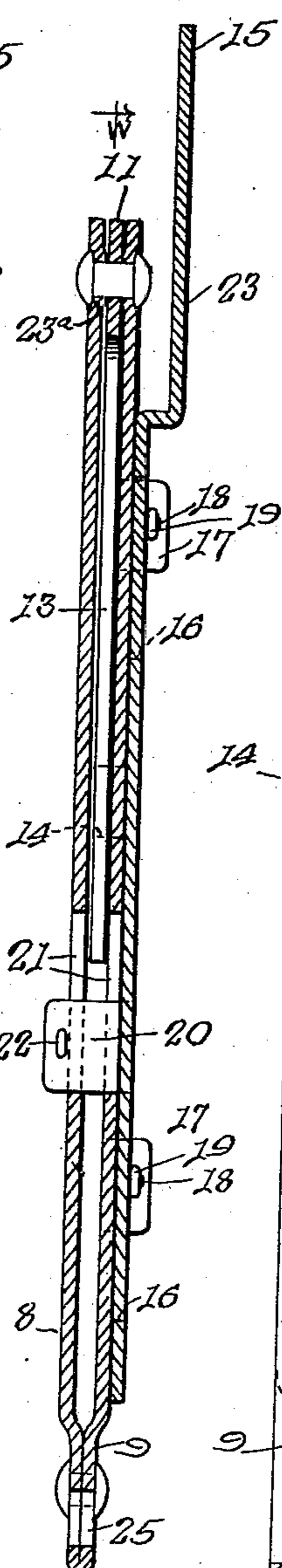


Fig. 5.

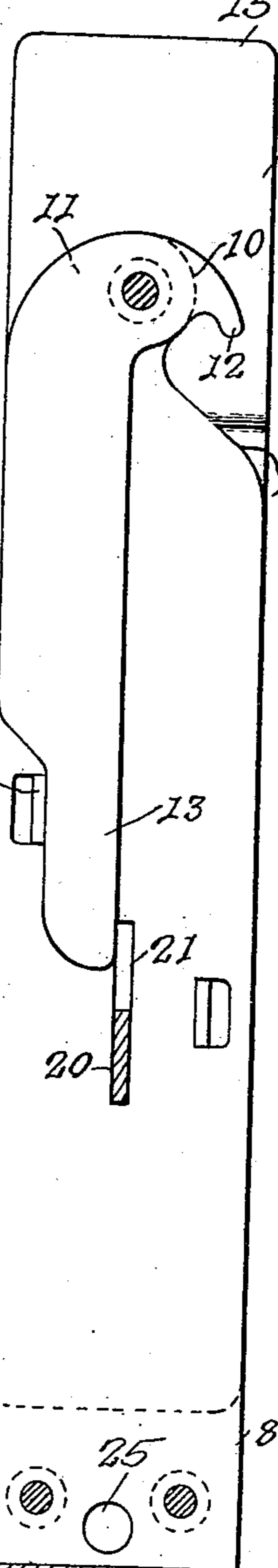


Fig. 6.

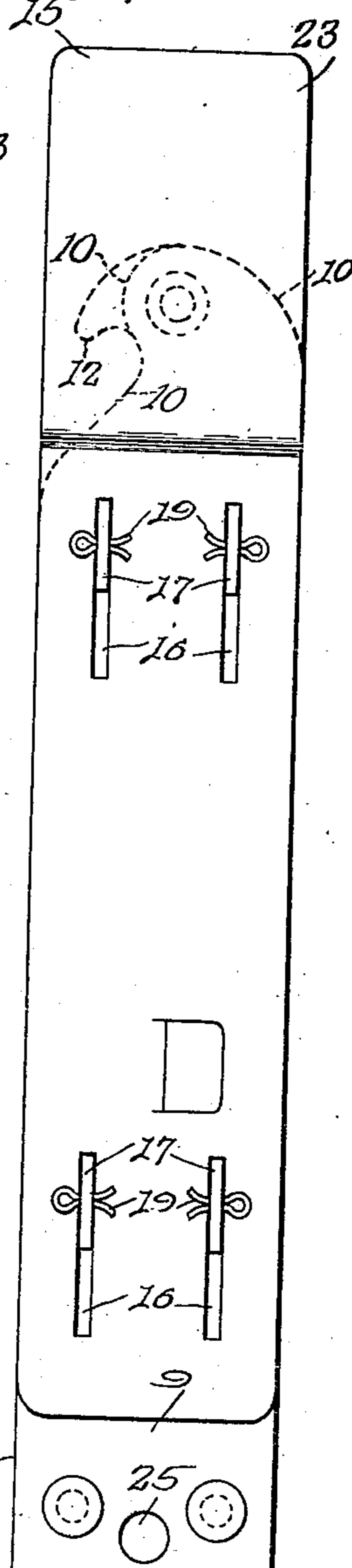


Fig. 7.

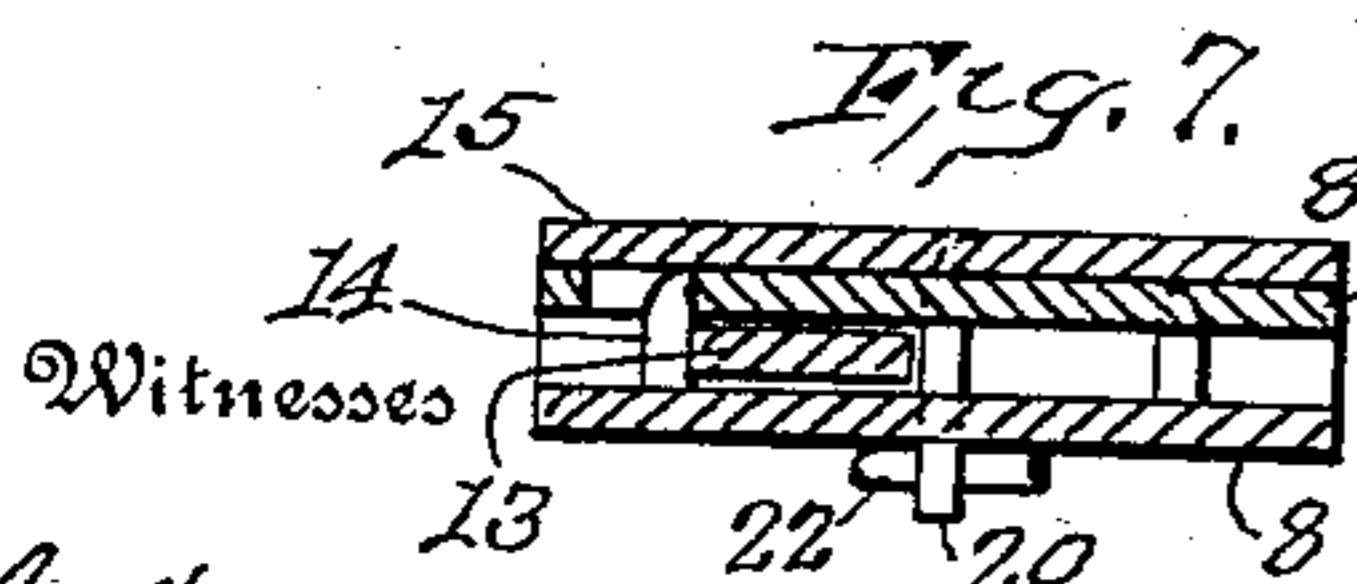


Fig. 8.

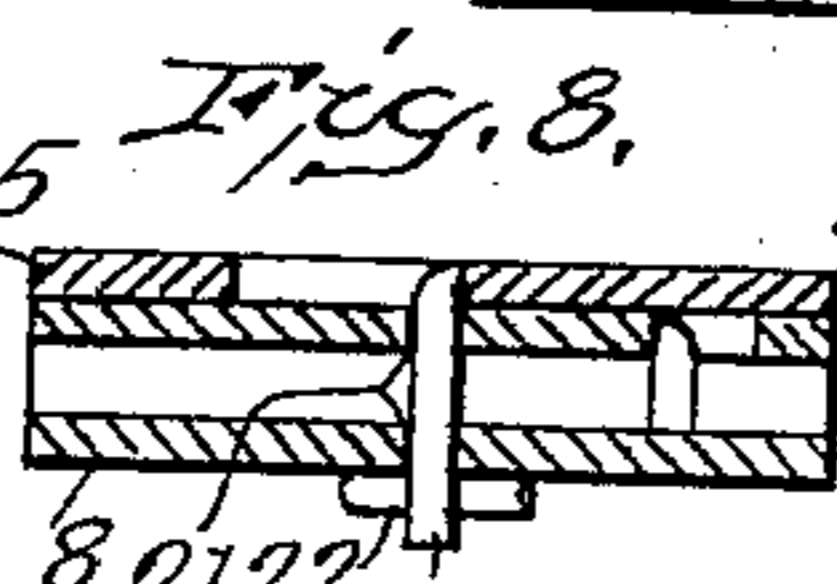
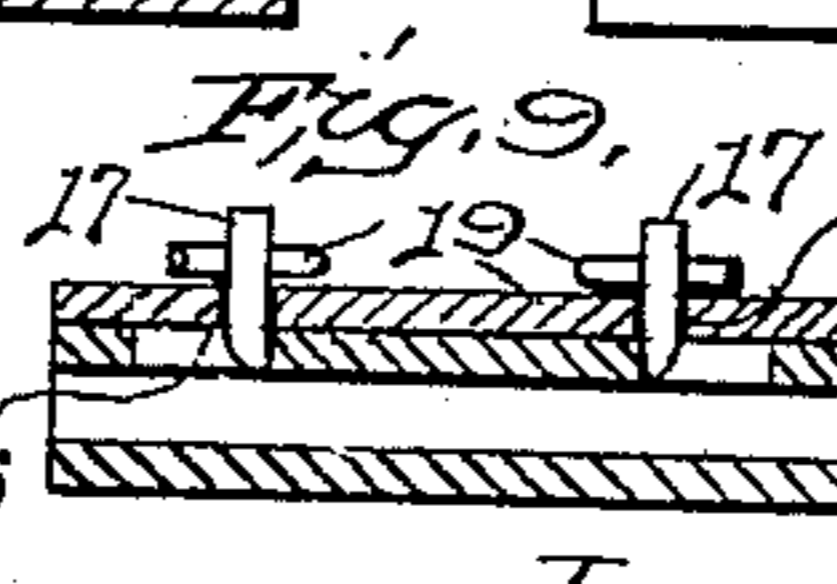


Fig. 9.



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UNITED STATES PATENT OFFICE.

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DOOR-CONTROLLING DEVICE.

No. 914,817.

Specification of Letters Patent.

Patented March 9, 1909.

Application filed February 8, 1908. Serial No. 414,917.

To all whom it may concern:

Be it known that I, IRA FILSON, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Door-Controlling Devices, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to door controlling devices, and more particularly to devices for controlling the movement of automatically closing fire-proof doors.

The object of the invention is to provide controlling means for such a door which will serve normally to retain the door in its open position, but which, in case of fire, will automatically release the door and permit the closing devices to close the same; and further, to provide an improved form of connecting links which serves to retain the door in its open position and to automatically release the same.

With these objects in view my invention consists in certain novel features of construction and in certain parts and combinations hereinafter to be described, and then more particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a front elevation of an automatically closing door equipped with my invention; Fig. 2 is a similar view of a modified form of door closing mechanism and also a modified form of controlling mechanism; Fig. 3 is a side elevation of the connecting link; Fig. 4 is a longitudinal sectional view, taken centrally through Fig. 3; Fig. 5 is a vertical sectional view taken on the line *ww* of Fig. 4; Fig. 6 is an elevation of a side of the connecting link opposite that shown in Fig. 3; Fig. 7 is a transverse sectional view, taken on the line *xx* of Fig. 3; Fig. 8 is a transverse sectional view, taken on the line *yy* of Fig. 3; and Fig. 9 is a transverse sectional view, taken on the line *zz* of Fig. 3.

In carrying out my invention, I provide an automatically closing door with suitable means for retaining the same normally in an open position, which means preferably consists of a weight secured to the door through a suitable connecting medium. Interposed between the weight and the door is a suitable connecting link comprising a member adapted to be secured to one portion of said connecting medium and a second member movably

mounted on said first-mentioned member adapted to be detachably secured to another portion of said connecting medium, said first-mentioned member being also provided with suitable means for controlling the movement of said movable member.

In Fig. 1 of the drawings I have illustrated the preferred form of my invention, in which the reference numeral 1 indicates the fire-proof door which is provided with roller-carriers 2 mounted upon an inclined track 3, the pitch of which is such that the door, when unrestrained, will tend, under the influence of gravity, to move toward a closed position. This door is provided with suitable means for retaining the same in its open position, such as a weight 4, which is secured to the door 1 by means of a cable 5 extending about a guide or pulley 6 and secured at its other end to said door. Interposed between the weight 4 and the door 1, and preferably serving to connect the cable 5 with the weight 4, is a connecting link 7 adapted to detachably connect said weight to said cable. This connecting link may be of any suitable construction, but I prefer that herein shown which comprises a frame, such as a housing 8, preferably consisting of two substantially parallel side members or walls spaced some distance apart and connected one to the other at their lower ends, preferably by bending said ends inwardly, as shown at 9, in Fig. 4 and riveting the same together. In the present instance, I have shown these side walls as formed of a single strip of material bent upon itself to form a housing, but, obviously, this housing could be formed in any suitable manner. The upper ends of both side walls of the housing are reduced by cutting away the same on the opposite sides thereof, preferably in the manner shown at 10.

Pivotaly mounted on the frame, and preferably between the reduced upper portions of the side walls of said housing, is a lever 11, one portion of which extends beyond the edge of the housing and is hook-shaped, as shown at 12. The construction of said hook-shaped portion is such that when the lever is in its normal position, the hook will extend at substantially right angles to the length of the housing, and that portion, 13, of the lever 11 lying on the opposite side of the pivotal center will extend downwardly between the side walls of the housing. A

suitable fixed stop 14 is provided for limiting the rearward movement of the lower portion of said lever, while a movable stop is provided for controlling the forward movement thereof. This movable stop may be of any suitable construction, but preferably is of the form herein shown which comprises a plate 15 slidably mounted on one of the side walls of the housing and preferably provided with longitudinal slots 16 adapted to receive lugs or projections 17 extending outwardly from said housing and preferably comprising ears struck from the adjacent side wall of said housing and extending at substantially right angles thereto and provided with suitable apertures 18 adapted to receive cotter pins 19 to secure the slidable plate 15 to the housing and hold the several parts in their assembled position. This slidable plate 15 is provided with an inwardly extending stop or projection 20 which extends through a slot 21 in the adjacent side wall of said housing. This slot is of such a length and so arranged in the side wall that its upper end extends some distance beyond the lower end of the portion 13 of the lever 11 when the same is in its normal position and the lower end of said slot extends some distance below the end of said lever. Thus, the stop 20 when in the lowermost portion of said slot lies out of the path of said lever and the same is free to move about its pivotal center, but when the stop is in the upper portion of the slot 21, it lies in the path of said lever and serves to hold the same against movement about its pivotal center. In the present instance, I have shown the stop 20 as extending through both side walls of said housing and provided with a cotter pin 22 extending through that portion of the same lying beyond the side wall farthest removed from the plate 15. This construction gives greater strength to the stop, but is not necessary to the successful operation of the device. The slidable plate 15 extends some distance beyond that end of the housing in which the lever 11 is pivoted and that portion of the plate 15 which extends beyond the housing is preferably offset from the main portion thereof, as shown at 23. The reduced upper ends of the side walls of the housing are preferably bent inwardly, as shown at 23^a, to engage the sides of the lever 11 and form friction members to restrict the movement of said lever.

The housing 8 may be secured to the weight 4 in any suitable manner, as by means of a link 24 connected to said weight and extending through an aperture 25 in the lower portion of said housing. The hook-shaped portion 12 of the lever 11 is engaged in a loop formed in the adjacent end of the cable 5, and, with the stop 20 in the path of said lever, forms a continuous connection between the weight and the door 1. Suitable means

are provided for automatically releasing the lever 11 in case of fire and detaching the hook-shaped portion thereof from the cable 5 and thus permitting the door to close. This means preferably consists of a weight supported above the connecting link 7 and adapted, when released, to engage the upper end of the slidable plate 15 and move the same downwardly. In the form here shown, the weight 26 is provided with a central aperture 27, through which the cable 5 extends, and this weight is supported by means of a link 28 which engages a notch or hook 29 formed in one side of a rotatable disk 30 supported upon the adjacent wall. This rotatable disk is provided with a second notch or hook 31 arranged at substantially right angles to the notch 29 and facing in the opposite direction. This hook 31 is adapted to be engaged by one end of a cable 32, the opposite end of which is secured to a fixed point by means of a destructible member, such as a fusible link 33, which is connected to a stop 34 secured to the wall near the doorway. This link is preferably arranged adjacent to said doorway so that it will be exposed to the heat from either side of the wall in which the doorway is formed.

In case of fire, as soon as the temperature rises above a certain predetermined point, the heat so weakens the fusible link 33 that the same will separate and allow the rotatable disk 30 to rotate, thus releasing the weight 26, allowing the same to move downwardly into contact with the upper end of the slidable plate 15, moving said plate downwardly and carrying the stop 20 out of the path of the lower end of the lever 11, thereby allowing the lever to rotate about its pivotal center and detaching the hook-shaped portion 12 thereof from the cable 5, thus releasing said cable, and the door to which it is attached, from the weight 4 and permitting the same to close.

In Fig. 2 of the drawings, I have shown the invention as applied to a door provided with automatic closing mechanism of a different construction. In this form of the device, the door 35 is mounted upon a horizontal track 36 and a suitable weight 37 is provided for closing the same. This weight is provided with a cable 38 which extends upwardly over a guide or pulley 39, and, in the present instance, extends across the doorway, through an apertured lug or plate 40 on the door 35, which, if desired, may be adjustably mounted on the door, and is provided at its end with a ring 41 adapted to engage the hook-shaped portion 12 of the lever 11 of the connecting link 7. The opposite end of the link 7 is connected by means of a cable 42, extending over a suitable guide or pulley 43, with a weight 44 which is somewhat smaller than the weight 37. In order to prevent the weight 37 from overcoming

the resistance of the weight 44 under normal conditions, an additional supporting mechanism is provided for the weight 37, which, in the present instance, consists of a loop of wire, or a link 45 adapted to engage a notch in a rotatable disk 46, similar in construction to the disk 30 shown in Fig. 1. The second notch of said disk 46 is adapted to engage one end of a cable 47 which is secured to a fixed point on the wall, preferably close to the door 35 on the opposite side of the doorway, and has a destructible member, such as a fusible link 48, interposed between the ends thereof.

In case of fire, the rising temperature will destroy the fusible link 48, permitting the weight 37 to move downwardly against the resistance of the weight 44, thus bringing the sliding plate 15 of the connecting link 7 into contact with the stop 40 on the door 35, thereby releasing the pivoted lever and detaching the same, and the weight which is carried thereby, from the ring 41 of the cable 38. The ring 41, which is of such a size as to prevent its passing through the apertured lug 40, serves to connect the cable 38 to the door 35 and the entire force of the downwardly moving weight 37 is now exerted on the fire-proof door 35 and the same is moved to its closed position. The use of the counterbalancing weight 44 is desirable in an apparatus of this character in order to prevent the weight 37, when suddenly released, from exerting such a severe strain upon the door 35 as to break some of the parts of the operating mechanism.

A further advantage arising from this construction, which employs a weight at each end of the cable, is that the cable is at all times taut and is prevented from sagging when the door is closed under normal conditions, this being due to the arrangement whereby the apertured lug on the door moves freely along the cable, there being no positive connection between the door and cable under normal conditions.

While I have shown and described the invention as applied to automatic closing mechanism of two particular types, it will be obvious that the same could be adapted to various types of such mechanism, and that the construction of the connecting link could be widely varied to adapt the same to various conditions, and, therefore, I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a device of the character described, the combination, with a door, and means for closing the same, of means for retaining

said door in an open position, a detachable connection between said retaining means and said door, and means for automatically and positively engaging said connection to disconnect the same.

2. In a device of the character described, the combination, with a door, and means for closing the same, of a weight for retaining said door in an open position, a detachable connection between said weight and said door, and means supported near the same for automatically actuating said connection to detach the same.

3. In a device of the character described, the combination, with a door, and means for closing the same, of means for retaining said door in an open position, a detachable connection between said retaining means and said door, and a weight supported above said detachable connection and adapted, when released, to actuate said detachable connection to detach the same.

4. In a device of the character described, the combination, with a door, and means for closing the same, of a cable secured to said door, a weight, a detachable connection for securing said weight to said cable, a second weight slidably mounted on said cable above said detachable connection, a support for said second weight, and a destructible member forming part of said support.

5. In a device of the character described, the combination, with a door, and means for retaining the same normally in one position, of a detachable connection interposed between said retaining means and said door and comprising a fixed member, a movable member, means for controlling the movement of said movable member, and means for actuating said controlling means.

6. In a device of the character described, the combination, with a door, and means for retaining the same normally in one position, of a detachable connection interposed between said retaining means and said door comprising a fixed member, a movable member, means for controlling the movement of said movable member, and means independent of said detachable connection for actuating said controlling means.

7. In a device of the character described, the combination, with a door, and a weight connected to said door, of a connecting link interposed between said door and said weight and comprising a member secured to said door, a second member secured to said weight and free from said door, one of said members being movable, and means for controlling the movement of said movable member.

8. In a device of the character described, the combination, with a door, a weight, and a cable connected to said door, of a connecting link comprising a member secured to said weight, a second member movably mounted on said first-mentioned member and detach-

ably secured to said cable, and means for controlling the movement of said movable member.

9. In a device of the character described, the combination, with a door and means for closing the same, of a connecting link comprising a frame, a lever pivotally mounted on said frame and having one of its ends hook-shaped, and a movable stop carried by said frame and adapted to be moved into and out of the path of said lever.

10. In a device of the character described, the combination, with a door and means for closing the same, of a connecting member comprising a housing, a lever pivotally mounted within said housing and having one of its ends hook-shaped and extending beyond the edge of said housing, a movable member slidably mounted on said housing, and a stop carried by said slidable member and adapted to extend into the path of said lever.

11. In a device of the character described, the combination, with a door and means for closing the same, of a connecting link comprising a housing having a longitudinal slot therein, and a plurality of projections on one of the side walls thereof, of a lever pivotally mounted within said housing near one end thereof and having one end hook-shaped and extending beyond the edge of said housing and its other end extending between the walls of said housing to a point beyond one end of the slot therein, a plate mounted between the side walls of said housing, having slots adapted to receive the projections on

said side wall, and extending beyond the end of said housing, and a projection carried by said plate and adapted to extend through the slot in the said housing.

12. In a device of the character described, the combination, with a door, and a cable connected thereto, of a weight, a connecting link having a frame adapted to be secured to said weight, a lever pivotally mounted on said frame having one end hook-shaped and adapted to engage the end of said cable, a plate slidably mounted on said frame and extending beyond the end thereof, a stop carried by said plate and extending into the path of said lever, and a second weight slidably mounted on said cable and adapted, when released, to engage the end of said slidable plate to move the stop out of the path of said lever, thereby permitting the same to turn about its pivotal axis and release said cable.

13. In a device of the character described, the combination, with a door, and means for closing the same, of a cable secured to said door, a weight, a detachable connection for securing said weight to said cable, a second weight supported above said detachable connection, and a destructible member forming a part of the support for said weight.

In testimony whereof, I affix my signature in presence of two witnesses.

IRA FILSON.

Witnesses:

HARRIET L. HAMMAKER,
J. FRED ANDERSON.