

(No Model.)

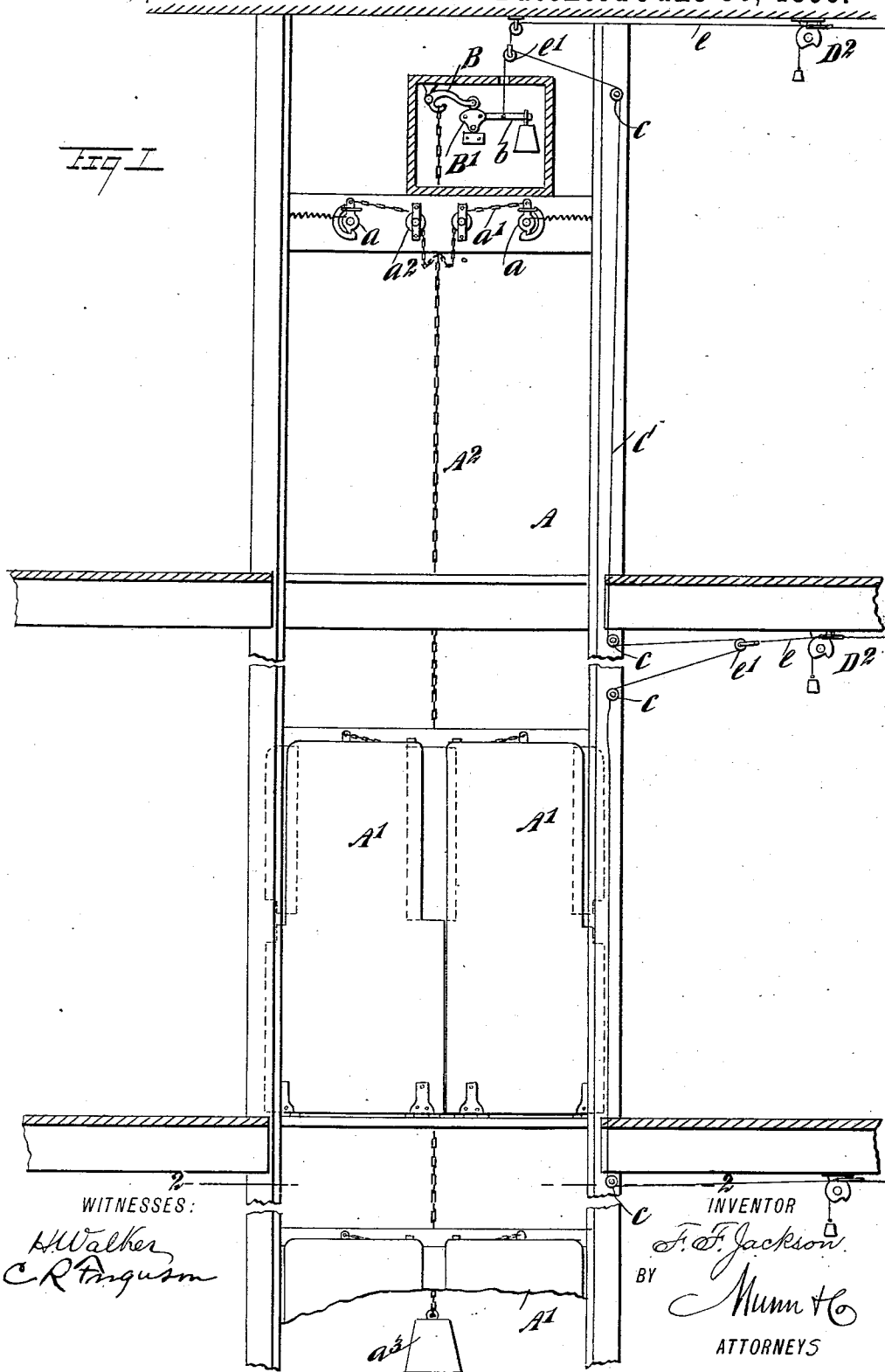
2 Sheets—Sheet 1.

F. F. JACKSON.

DEVICE FOR AUTOMATICALLY CONTROLLING CLOSING HATCHWAY
OR OTHER DOORS.

No. 563,180.

Patented June 30, 1896.



WITNESSES:

H Walker
C R Ferguson

INVENTOR

F. F. Jackson.
BY *Munn & Co*
ATTORNEYS

(No Model.)

2 Sheets—Sheet 2.

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Fig 2

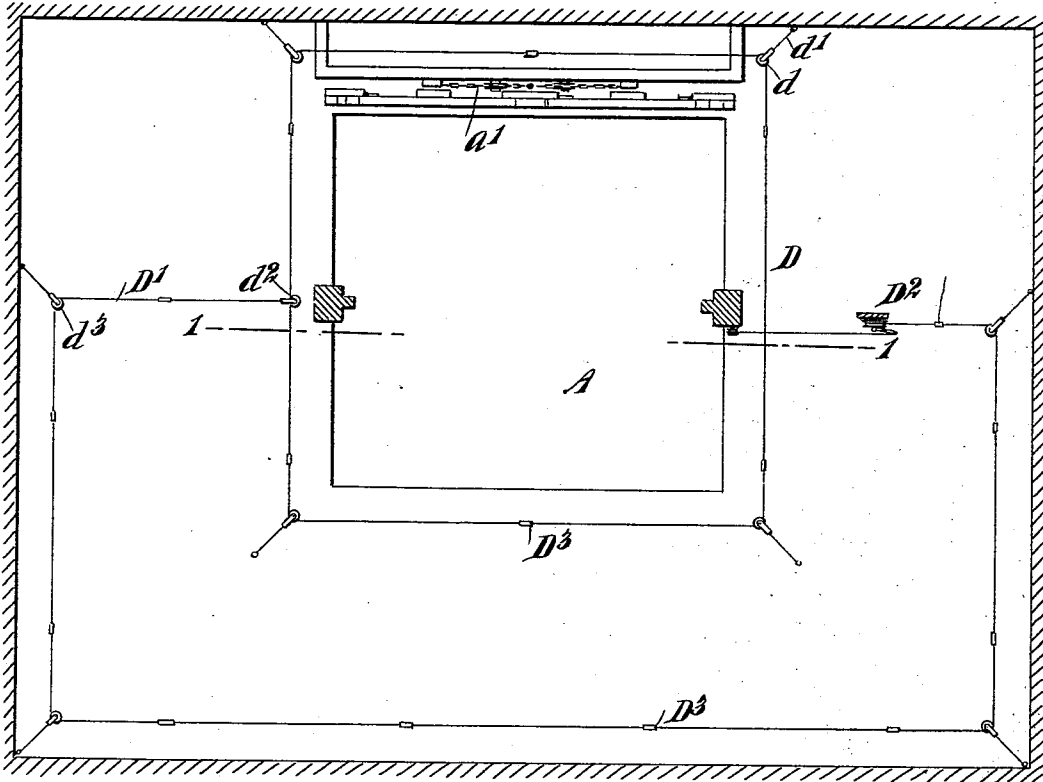


Fig 3

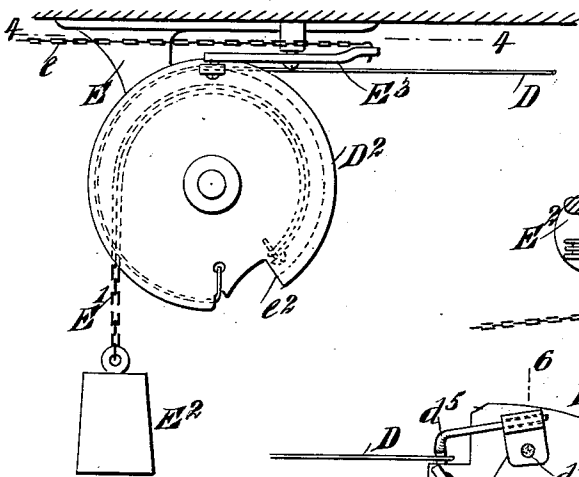


Fig 4

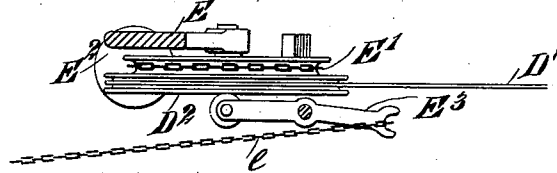
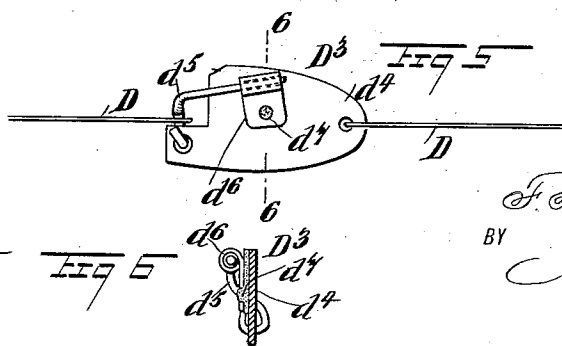


Fig 5



WITNESSES:

H. Walker
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Fig 6



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UNITED STATES PATENT OFFICE.

FREDERICK F. JACKSON, OF RICHMOND, INDIANA.

DEVICE FOR AUTOMATICALLY CONTROLLING CLOSING HATCHWAY OR OTHER DOORS.

SPECIFICATION forming part of Letters Patent No. 563,180, dated June 30, 1896.

Application filed December 18, 1895. Serial No. 572,588. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK F. JACKSON, of Richmond, in the county of Wayne and State of Indiana, have invented a new and useful Device for Automatically Controlling the Closing of Hatchway or other Doors, of which the following is a full, clear, and exact description.

This invention relates to a device for automatically controlling the closing of hatchway or other doors, and it has for its object to provide a system of wiring having connection with the locking mechanism for the doors, and a series of fusible links in the wiring, which will quickly melt in case of fire and allow certain releasing mechanism to operate.

I will describe a system embodying my invention, and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a vertical section on the line 1 1 of Fig. 2 of a system embodying my invention. Fig. 2 is a partial plan and a partial section on the line 2 2 of Fig. 1. Fig. 3 is a side elevation of a releasing device employed. Fig. 4 is a sectional view thereof on the line 4 4 in Fig. 3. Fig. 5 is a plan view of a fusible link employed, and Fig. 6 is a section on the line 6 6 of Fig. 5.

Referring to the drawings, A designates a hatchway, and A' indicates hinged doors for the opening at each floor. The doors are held normally open by a locking mechanism adapted to be released automatically in case of fire in the building, as will be hereinafter more fully explained, to allow the doors to close by gravity, and thus prevent the spread of flames through the hatchway from one floor to another. The locking mechanism comprises pivoted releasing-levers *a*, from which chains *a'* extend over pulleys *a*². A chain A² extends downward behind the series of doors, and to the lower end of this chain A² a tripping-weight *a*³ is attached. The chains *a'* of each locking mechanism are attached to the chain A² in such manner as to hang loose while the chain A² is in its normal suspended position. The upper end of the chain A² has

an automatically-detachable connection at its upper end, with a hook-lever B pivoted in a casing above the top locking devices. The end of the long arm of the lever B rests on the upper side of a pivoted cam B', which has a weighted arm *b* extended outward from it.

C is a safety chain, wire, or rope attached at its upper end to the lever *b*, and extended down through all the hatchways over pulleys *c*, attached to one of the side frames of the hatchway. The chain C is held taut to support the weighted lever *b* by a system of wiring attached to the ceiling of each room through which the hatchway passes, which I will now describe.

Referring to Fig. 2, which shows the system of wiring in plan view, D indicates a wire or other flexible connection extended around the hatchway and through pulleys *d*, which have flexible connections *d'* with the ceiling. Four of these pulleys *d* are shown as holding the wire D in a rectangular position or in straight lines between pulleys. A wire D' has a pulley connection *d*² with one stretch of the wire D, and this wire D' extends around the edge of the ceiling through suspended pulleys *d*³ to a connection with a tension device D³, which I will presently describe.

Located at suitable intervals in the wires D D' are fusible links D³. Each link consists of a plate *d*⁴, a hook *d*⁵, having pivotal connection with one end of the plate, and a keeper *d*⁶, secured by an easily-fusible solder to the plate, as at *d*⁷, and having a socket portion through which the end of the hook *d*⁵ normally extends. This hook *d*⁵ has a portion extended transversely of a cut-away portion of the plate, and a portion extended longitudinally of the plate and into the keeper. One end of a section of wire D is connected to one end of the plate *d*⁴, and the other end has a loop connection with the hook *d*⁵.

The tension device D³ consists of a pulley having two grooves formed in its periphery, and supported on a stud extended from a hanger E, depending from the ceiling. The end of the wire D' extends around the pulley in one of its grooves, and is attached at its end to the pulley, and a chain E', having a weight E² at its end, passes around the pulley in its other groove. It is obvious that

the weight E^2 will maintain the several wires under proper tension whether expanded or contracted by atmospheric changes.

E^3 is a lever pivoted between its ends to swing horizontally. At one end the lever E^3 has a friction-roller adapted to bear on the outer surface of the pulley D^2 near its periphery, and the other end of the lever is forked to be detachably engaged by a chain e , which is connected to the chain C , the connection between the chains e and C above the lower story of a building consisting of the pulleys e' .

It will be seen that the pulley D^2 serves as a lock to normally hold the lever E^3 with its chain-engaging end on the side of the lever-pivot opposite to that of the pulley.

In case of fire on any floor of a building the fusible portion of a link D^3 will be melted by the heat, so that the hook d^3 will turn on its pivot to release the wire, and consequently releasing the pulley D^2 , which will be rotated by the weight E^2 , until a notch e^2 in the edge of the pulley comes in line with the end of the lever E^3 . The end of the lever will pass through the notch, allowing the lever to swing on its pivot to a position reverse to that of its normal position, when the chain e will be released to slacken the chain C , thus allowing the weighted arm b to rotate the cam B' out of engagement with the roller on the end of the hook-lever B . This hook-lever will now swing downward and release the chain A^2 , which, under the influence of the weight a^3 , will release the locking devices of the several doors, allowing them to close by gravity.

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

1. A device for automatically controlling hatchways or other doors, comprising door-locking mechanism, a suspended weight for releasing the locking mechanism, means for holding said weight suspended, a chain or the like forming part of said holding means, a wire, having fusible links, extended about the ceiling, one end of said wire engaging a tension device for said chain, a pivoted lever forming part of the tension device, and a connection between the lever and chain or the like, substantially as specified.

2. In a device of the character described, a chain or the like for supporting a lock-actuating mechanism, a pulley with which a ceiling-wire is connected, a weight for rotating the pulley, a horizontally-swinging lever having one end engaged with the sides of the pulley and adapted to move through a notch in the pulley, and a connection between the supporting-chain and one end of the lever, whereby when the pulley is rotated the lever may be reversed to release the connection, substantially as specified.

3. The ceiling-wire, comprising links, each consisting of a plate, a hook having pivotal connection with one end of the plate, and a keeper for the hook, the said keeper being secured to the plate by fusible solder, substantially as specified.

4. In a device for controlling fire-doors, a locking mechanism, lengths of flexible material having connection with the locking mechanism and extended along a ceiling fusible parts between the lengths of flexible material, rollers with which the lengths of flexible material engage, a weight-operated rotary part and a pivoted lever held normally by said rotary part and adapted to release the locking mechanism after being released by the rotary part, substantially as specified.

5. A locking and tripping mechanism for hatchway or similar doors, comprising a hook-lever pivoted adjacent to the upper door, a weighted cam-lever supporting the same, means for supporting the cam-lever, and a tripping-weight suspended from the hook-lever, substantially as specified.

6. A wire extended in straight lines around a hatchway, another wire connected at one end with the first-named wire, and extended in straight lines about the ceiling of a room, and having its opposite end connected to a tension and releasing device, and fusible links in the wires, each link comprising a plate, a hook pivoted thereto, and a hook-keeper secured by fusible solder to the plate, substantially as specified.

FREDERICK F. JACKSON.

Witnesses:

A. M. GARDNER,
CHARLES F. PEELLE.