

No. 688,750.

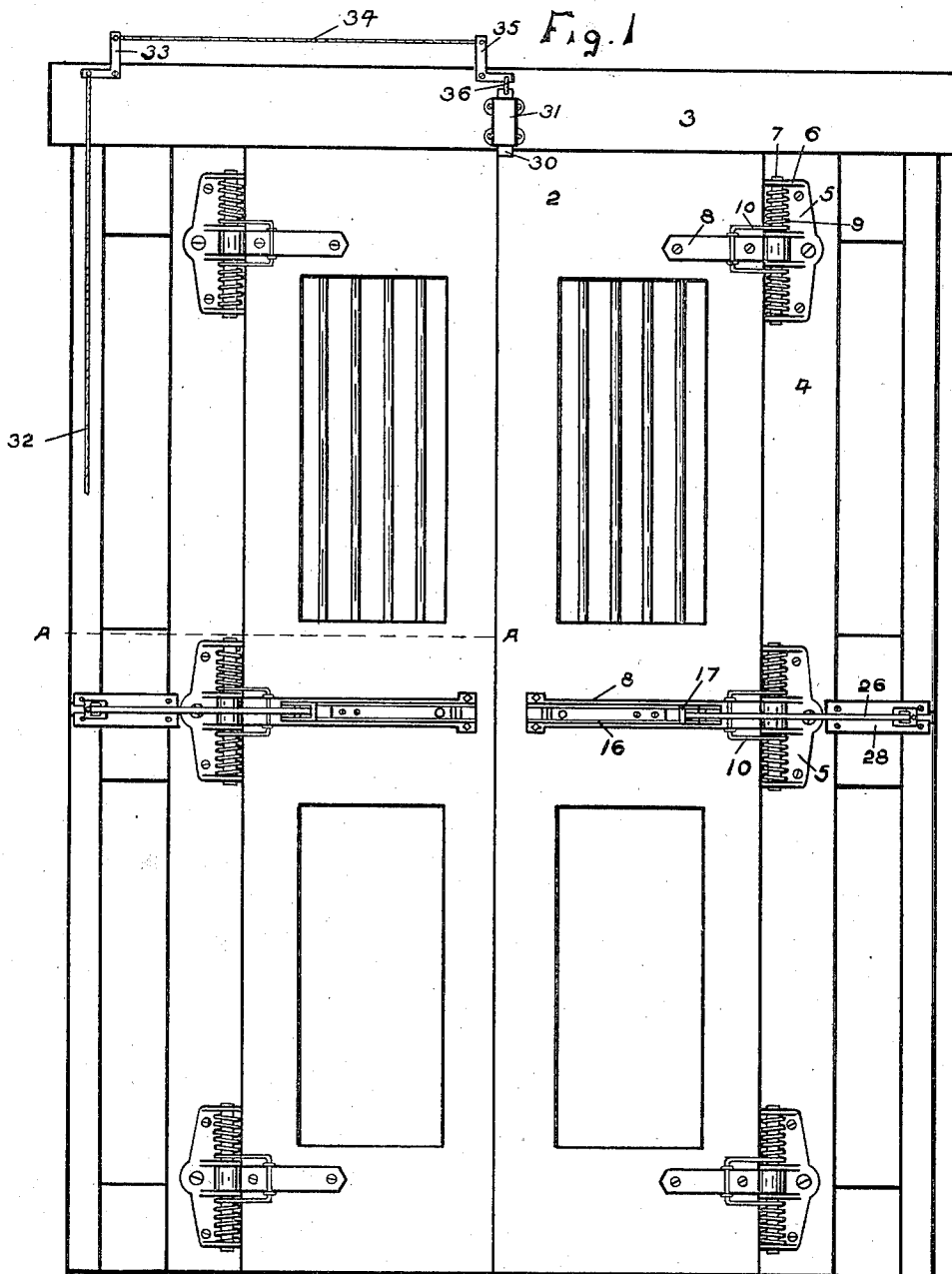
Patented Dec. 10, 1901.

J. W. STAKE.
SPRING STOP DOOR.

(Application filed Aug. 26, 1901.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:
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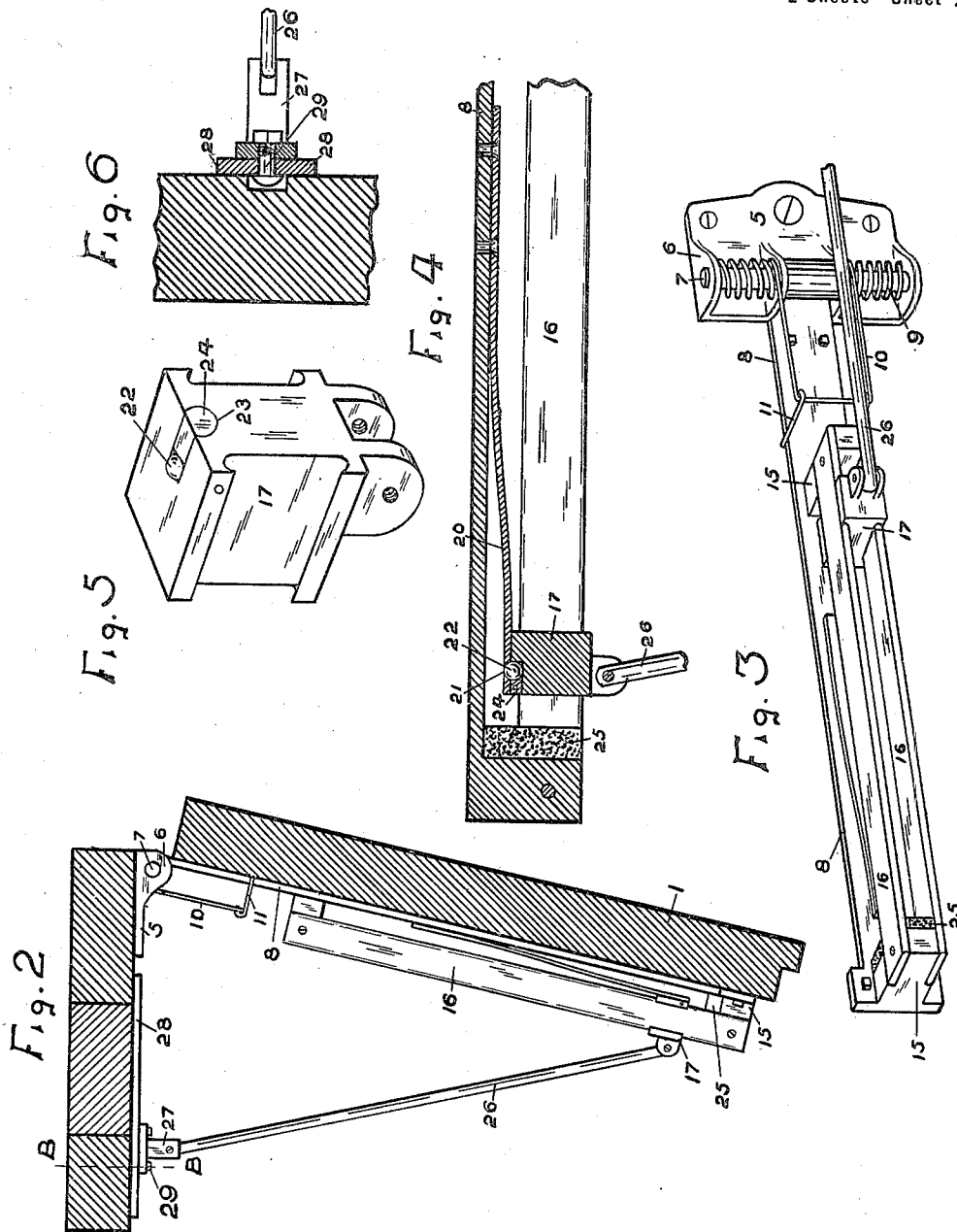
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UNITED STATES PATENT OFFICE.

JOHN W. STAKE, OF INDIANAPOLIS, INDIANA.

SPRING-STOP DOOR.

SPECIFICATION forming part of Letters Patent No. 688,750, dated December 10, 1901.

Application filed August 26, 1901. Serial No. 73,313. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. STAKE, of Indianapolis, county of Marion, and State of Indiana, have invented a certain new and useful Spring-Stop Door; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like numerals refer to like parts.

This invention relates to spring-stop doors, particularly such as are employed in fire-engine houses or other places where when the doors are released it is desired that they be automatically opened and stopped and held in a certain position when opened.

The features of this invention that I have originated will appear from the accompanying drawings and the following description and claims.

In the drawings, Figure 1 is a front elevation of a pair of doors with surrounding framework, all equipped with my invention. Fig. 2 is a horizontal section on the line A A of Fig. 1 looking downward and with the door open and held in its open position. Fig. 3 is a perspective of the spring-actuated hinge and stopping and holding device. Fig. 4 is a central horizontal section through the left-hand end of Fig. 3. Fig. 5 is a perspective of the sliding locking-block. Fig. 6 is a section on the line B B of Fig. 2.

In detail I show herein to explain the nature of my invention a pair of doors 1 and 2, set in and surrounded by a casing composed of a top piece 3 and the side frame-pieces 4. The hinge for mounting these doors consists of the plate 5, secured to the door-frame, having four ears 6, through which a pivot-pin 7 extends, and a metal strap 8, secured to the door, with an eye at one end through which the pin 7 passes. The two middle ears 6 are placed immediately on each side of the eye of the strap 8. The spring 9 is at each end coiled spirally around the pin 7, between the ears 6, and secured rigidly at its extreme ends to some part of the plate 5, preferably the ears 6, at each end. The central portion of the spring is extended to form a loop-arm 10, whose free end is caught and held by the hooked ends of catches 11, pivotally mounted on the strap 8 of the hinge, as

shown in Fig. 3. The preferable way to arrange the catches 11 is to form them out of one piece of wire that lies between the door and the strap 8 in a suitable notch for the purpose, as appears in Fig. 3. The springs on these hinges may be readily released by disengaging the arm 10 from the catches 11, and the door is supplied with three of such springs. If two will suffice, the third can be released and not used until there arises some necessity for its use. Any suitable covering for the coils 9, forming the springs or any other parts of the hinges, may be employed to suit the taste of the person using them, as there is nothing in my construction to prohibit the covering of such parts.

The means for stopping and holding the doors in their open position is mounted on a continuation of the arm 8, forming a part of the hinge. On said strap 8, at a point near the spring and at the outer extreme end, I secure by casting or otherwise the outward extensions 15. There are notches on their upper and lower sides to receive the guide-bars 16, one above and one below, which form a guideway for a sliding block 17, said block having on its upper and lower sides recesses to receive the guide-bars 16, as appears in Fig. 5, whereby said sliding block is prevented from escaping and guided in its movement. This sliding block works in connection with a flat spring 20, secured on the strap 8, as appears in Fig. 4, with its free end pressing outward toward and against the block 17. Near its free end said spring has a recess or hole at 21, adapted to receive a projection from the sliding block 17, and when said projection enters the hole 21 the spring stops the further movement of the block 17 unless forcibly released. Instead of a stationary projection from the block 17 to lock with said spring 20 I find it preferable to use and here show a ball 22, that is rotatable in said block 17. The ball decreases the friction between it and the spring 20 during the reciprocating movement of the block 17 and also renders the releasing of this holding means easier, and yet is as successful for stopping and holding the door as if the projection were stationary. The ball is mounted in the block 17 by cutting a groove in said block and plugging said groove.

with the plug 24, the groove 23 and the plug 24 inserted being as shown in Fig. 5. 25 is a piece of rubber secured to an extension 15 as a buffer. The connecting-rod 26 (shown in Fig. 2) is pivoted at one end to said sliding block 17 and at the other end to a block 27, that is adjustably mounted in the strap 28, that is secured to the casing opposite the doors. This strap 28 has a central longitudinal slot in it, as shown in Fig. 6, in which the block 27 is adjustably held by the set-screw 29.

The doors are held in the closed position by the spring-bolt 30 at the top of Fig. 1, that is mounted in the case 31 and pressed downward by a spring in said case, which, however, is not here shown. The doors are released by drawing the cord 32, which is secured to a bell-crank 33, connected by the cord 34 to the bell-crank 35, which in turn is connected by the link 36 to the spring-bolt 30. When the spring-bolt 30 is elevated and the doors are released, the spring-arms 10 on the spring-hinges immediately throw the doors open, and as the doors open the sliding block 17 moves outward from the position shown in Fig. 1 to the position shown in Fig. 2. The first half of the outward movement of the block 17 is not effected by the spring 20; but the last half of the opening of the door and movement of the block 17 outward is restrained somewhat by the engagement of the spring 20 with the block 17. This breaks the force of the spring-hinges in the latter part of the opening movement, so that the doors do not go back with a bang, but are moved gradually backward to the position shown in Fig. 2. When the ball 22 in the block 17 enters the hole 21 in the spring 20, the door stops and is held in that position until it is desired to close the door. The door is closed by the hand grasping the door and merely pushing it shut, as there are no latches that must be disengaged or unhooked in closing the door. When the door is closed, only enough force is necessary to move the ball 22 out of the hole 21 in the spring 20, which is one of the desirable advantages sought to be attained by my invention. To reach this result of locking the door by a means that can be unlocked without unhooking or unlatching anything, it is necessary to provide the spring 20, so as to check the movement of the door somewhat before the ball or projection 22 reaches the notch or hole in the spring, for otherwise the block 17 might pass beyond such notch or hole 21.

The combination of a door-stop with a co-acting spring-hinge by mounting them on the same metal strap is desirable in order to insure absolute accuracy of operation by maintaining them in exactly the same relative position toward each other at all times and under all conditions. Such arrangement also gives greater strength and security to the mounting of the hinge and stop, besides strengthening

the door, which is subjected to the strain of said hinge and stop mechanism.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with a spring-actuated door as one member, and a door-casing as another member, of a flat spring secured stationary to one of said members and having a recess in it, and a movable projection connected with the other member adapted to engage the spring and enter said recess when the door is opened.

2. The combination with a spring-actuated door and a door-casing, of a flat spring mounted horizontally on the door secured at one end and sprung away from the door with a recess in the free portion thereof, a guide mounted horizontally on the door near said spring, a block movable in the guide with a projection therefrom to engage the free portion of the spring and enter said recess, and a rod connecting said sliding block and the door-casing.

3. The combination with a spring-actuated door and a door-casing, of a spring mounted horizontally on the door secured at one end and sprung away from the door with a recess in the free portion thereof, a guide mounted horizontally on the door near said spring, a block movable in the guide, a ball mounted in the face of said block next to the spring to engage the spring and enter said recess, and a rod connecting said sliding block and the door-casing.

4. An attachment for a spring-actuated door consisting of a guide adapted to be secured horizontally to a door, a flat spring back of said guide with a recess therein, a block movable in said guide with a projection to engage the spring and enter said recess, a rod pivoted to one end of said block, and means pivotally connected to the other end of said rod for securing it to the door-casing.

5. An attachment for a spring-actuated door consisting of a frame having a longitudinal guideway, a flat spring back of said guideway secured at one end to the frame with a recess in the free portion thereof, a sliding block mounted in said guideway having a projection from its inner face to engage said spring and enter said recess, a rod pivotally connected at one end with the sliding block, and means pivoted at the other end for adjustably securing the rod to the door-casing.

6. The combination with a door and door-casing of a metal strap secured to the door and having an eye at one end, a plate secured to the casing with ears on it, a pivot-pin extending through said ears on the plate and the eye of the metal strap, spring-wire wound on said pivot-pin with an arm extending therefrom, and a catch connected with said metal strap for detachably engaging the free end of said arm.

7. A spring-hinge for a door consisting of a metal strap with an eye at one end, a plate adapted to be secured to the door-casing and

having ears extending therefrom, a pivot-pin extending through said ears and the eye in said strap, a spring-wire coiled about said pivot-pin on each side of the strap with the ends of said wire secured to the plate and the central portion thereof extended to form an arm, and catches held by the metal strap for detachably engaging said spring-arm.

8. A spring-hinge for a door including a metal strap adapted to be secured to the door and having an eye at one end, a plate adapted to be secured to the door-casing and having a row of four ears extending from said plate, the middle ears being immediately on each side of the eye of the strap, a pivot-pin extending through said ears and the eye of the strap, a spring-wire with its two ends secured to the ends of the plate and coiled spirally around the pivot-pin with the central portion extended in a loop to form an arm, and a wire loop about said metal strap with its free ends detachably engaging the free end of said spring-arm.

9. An attachment for a door consisting of a spring-hinge with an extended metal strap therefrom adapted to be secured to the door,

and a door-stop mechanism mounted on said strap.

10. An attachment for a door consisting of a metal strap adapted to be secured to the door and having an eye at one end, a plate adapted to be secured to the door-casing, a pivot-pin for securing the metal strap to the plate, a spring connecting said plate and metal strap for opening the door, a guideway secured horizontally to said metal strap, a flat spring back of said guideway secured to said metal strap at one end and with a portion sprung away therefrom and a recess in the free portion thereof, a sliding block in said guideway with a projection adapted to engage the spring and enter said recess, a rod pivotally connected at one end to said sliding block, and means pivoted to the other end of said rod for securing it to the door-casing.

In witness whereof I have hereunto affixed my signature in the presence of the witnesses herein named.

JOHN W. STAKE.

Witnesses:

FLORENCE E. BRYANT,
V. H. LOCKWOOD.