

No. 667,281.

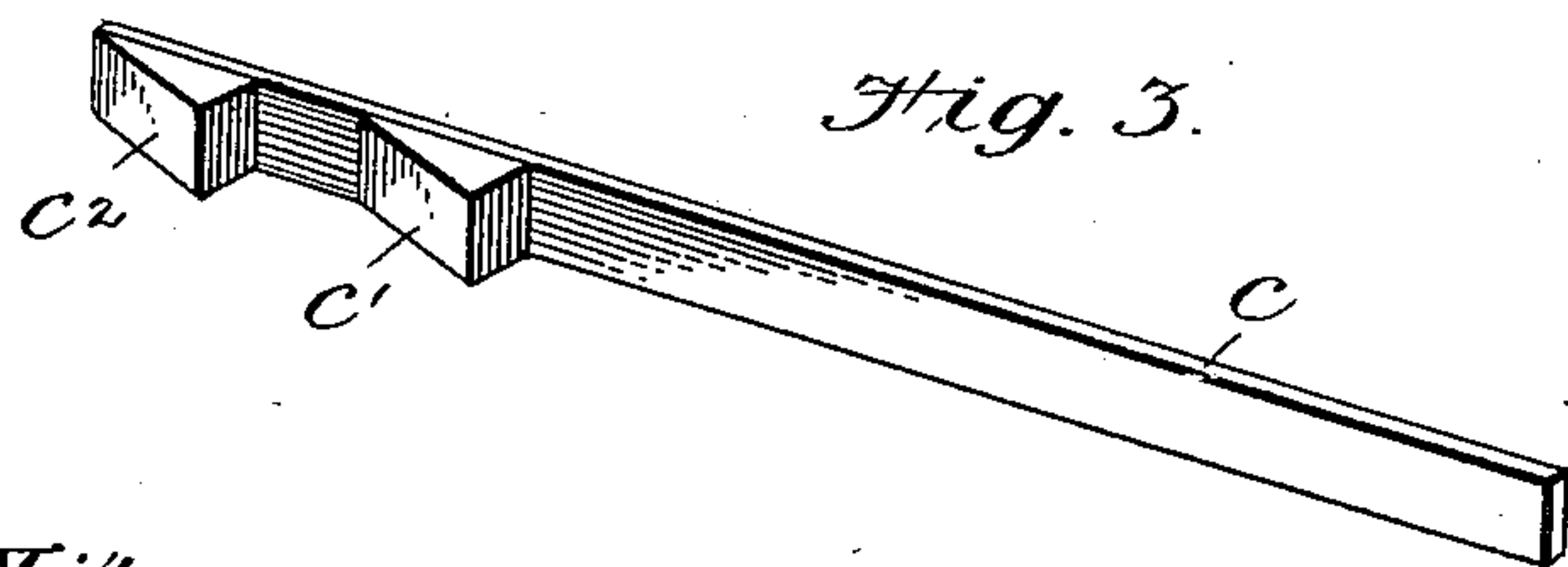
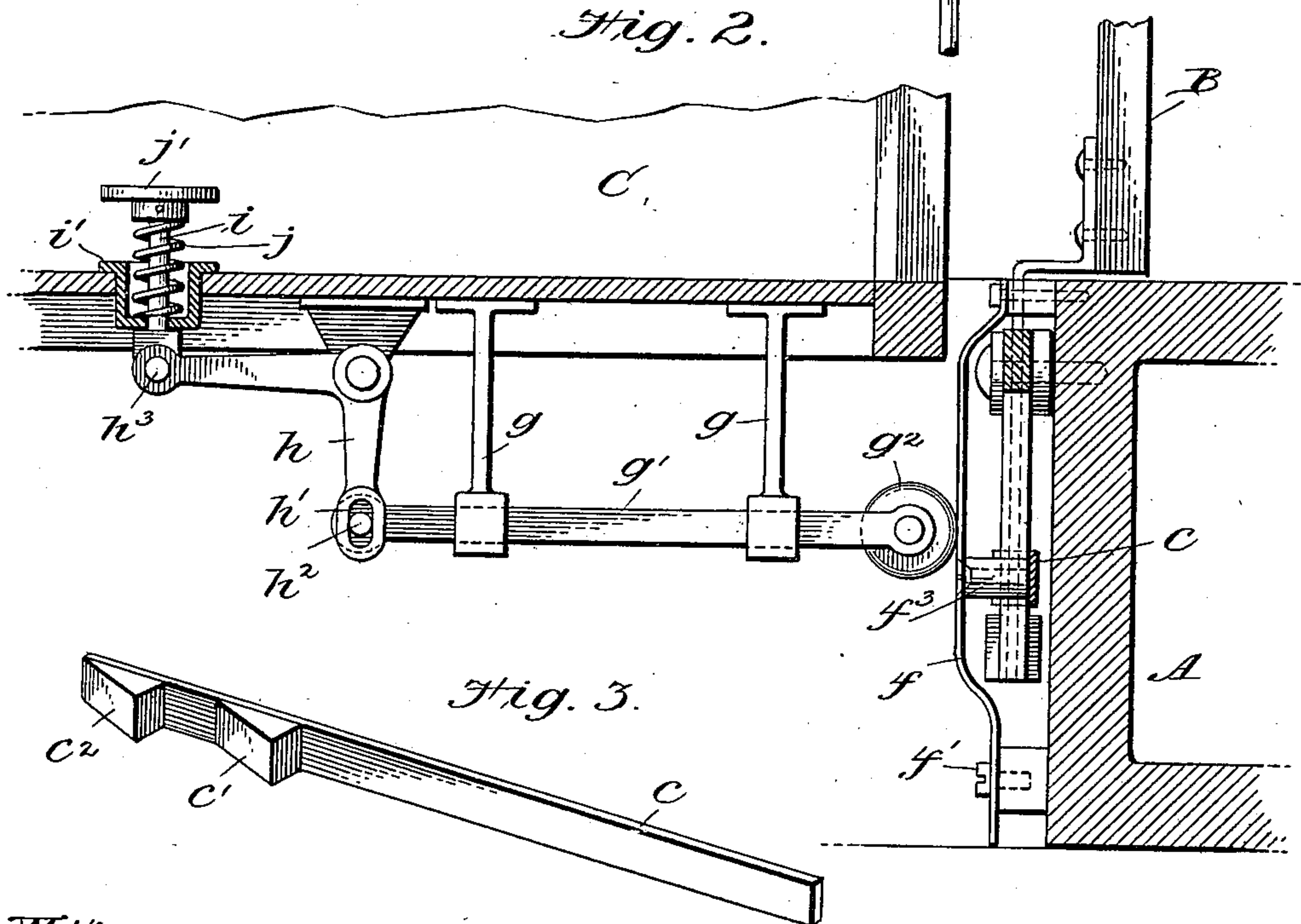
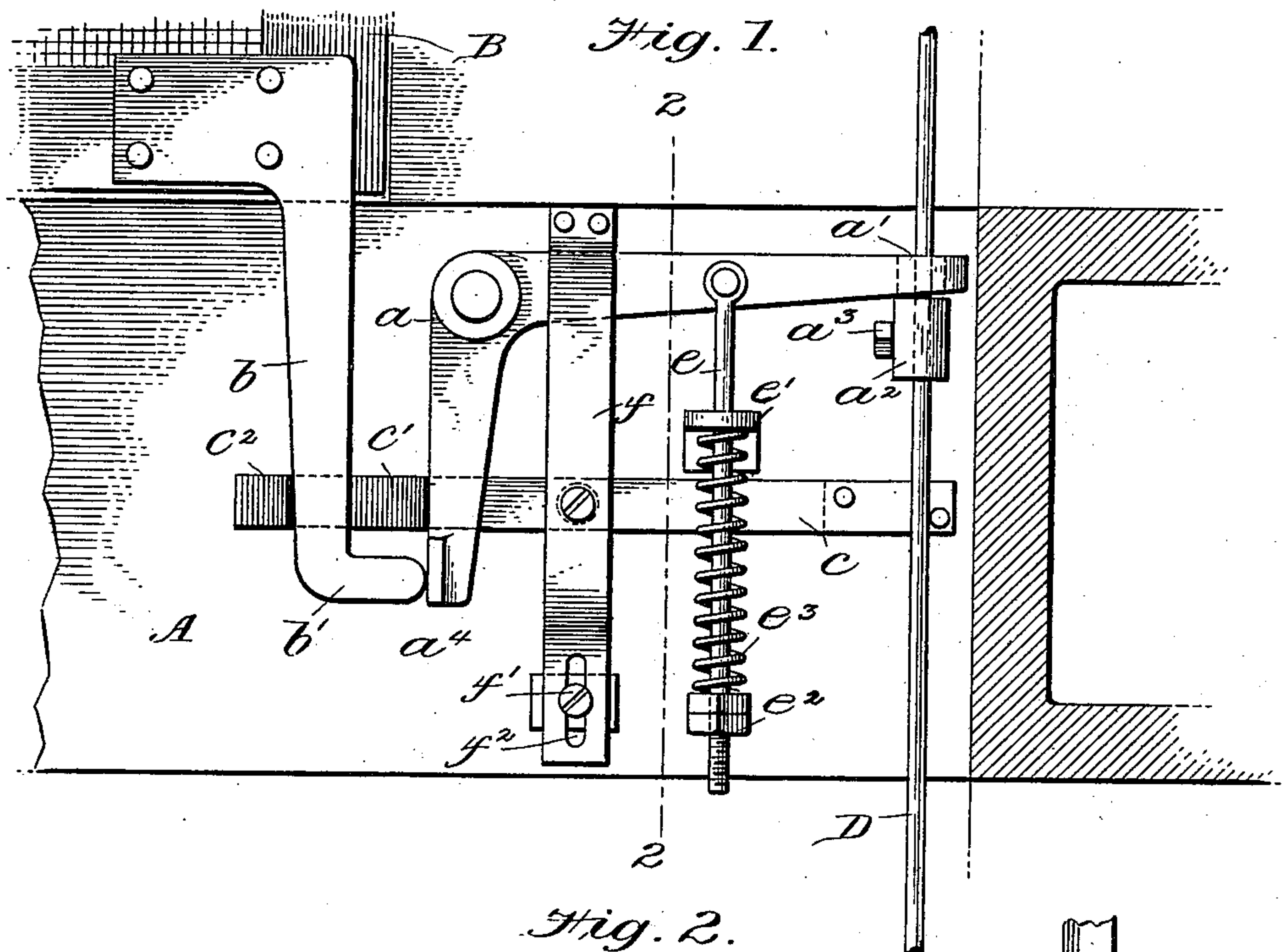
Patented Feb. 5, 1901.

I. ALLOWAYS & J. RAMSAY.
ELEVATOR.

(No Model.)

(Application filed May 15, 1900.)

3 Sheets—Sheet 1.



Witnesses.
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Frank Tunny

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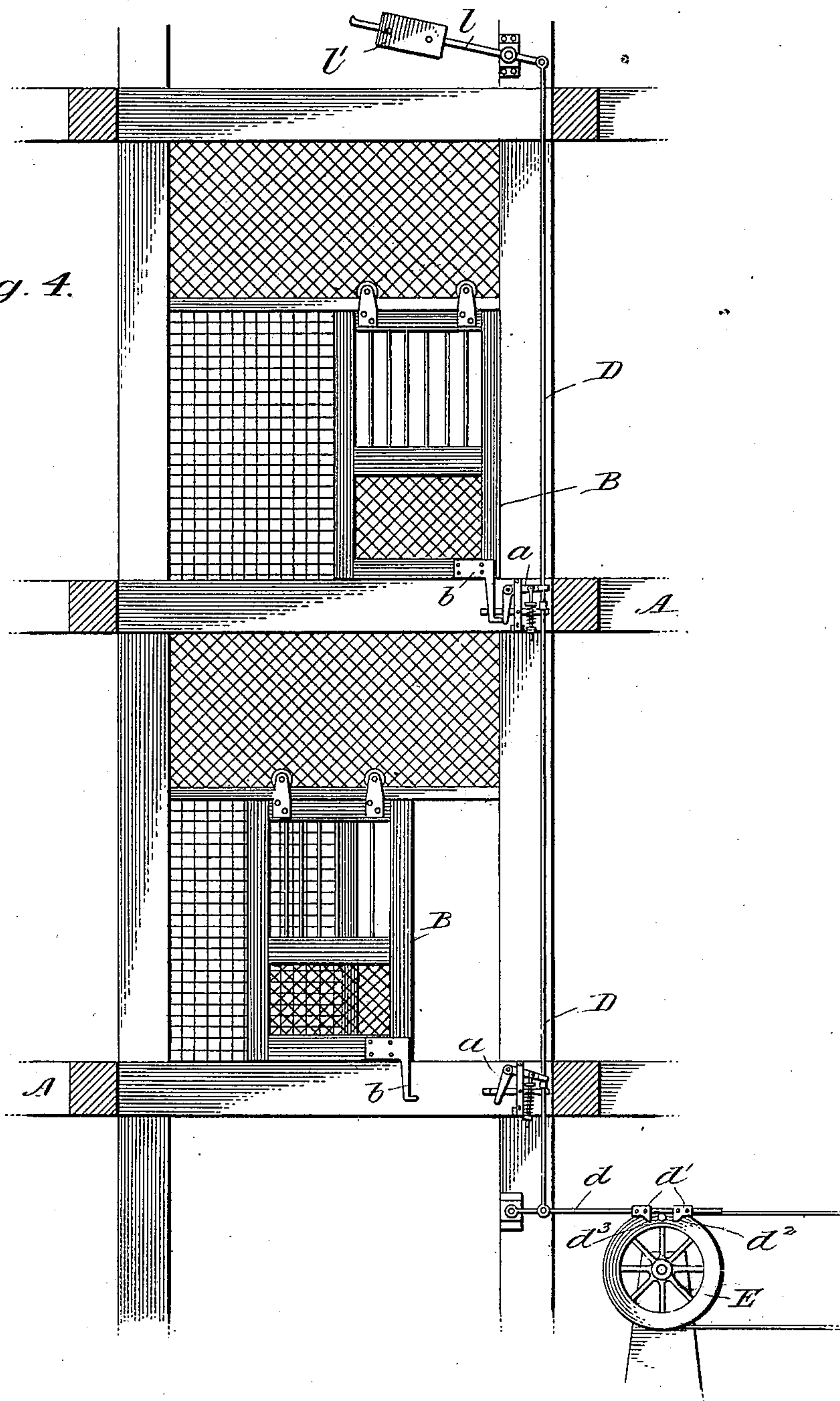
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ELEVATOR.

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3 Sheets—Sheet 2.

Fig. 4.



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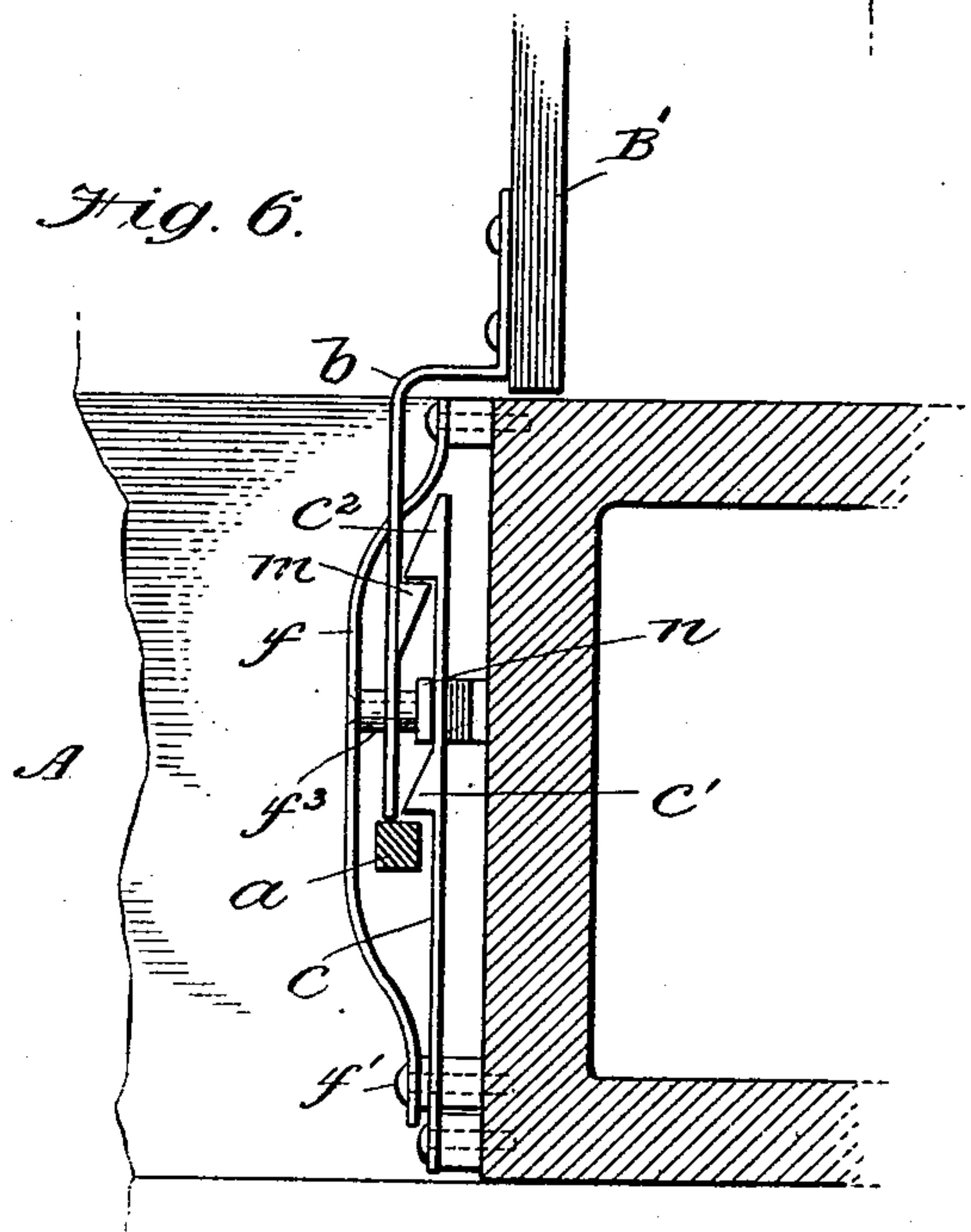
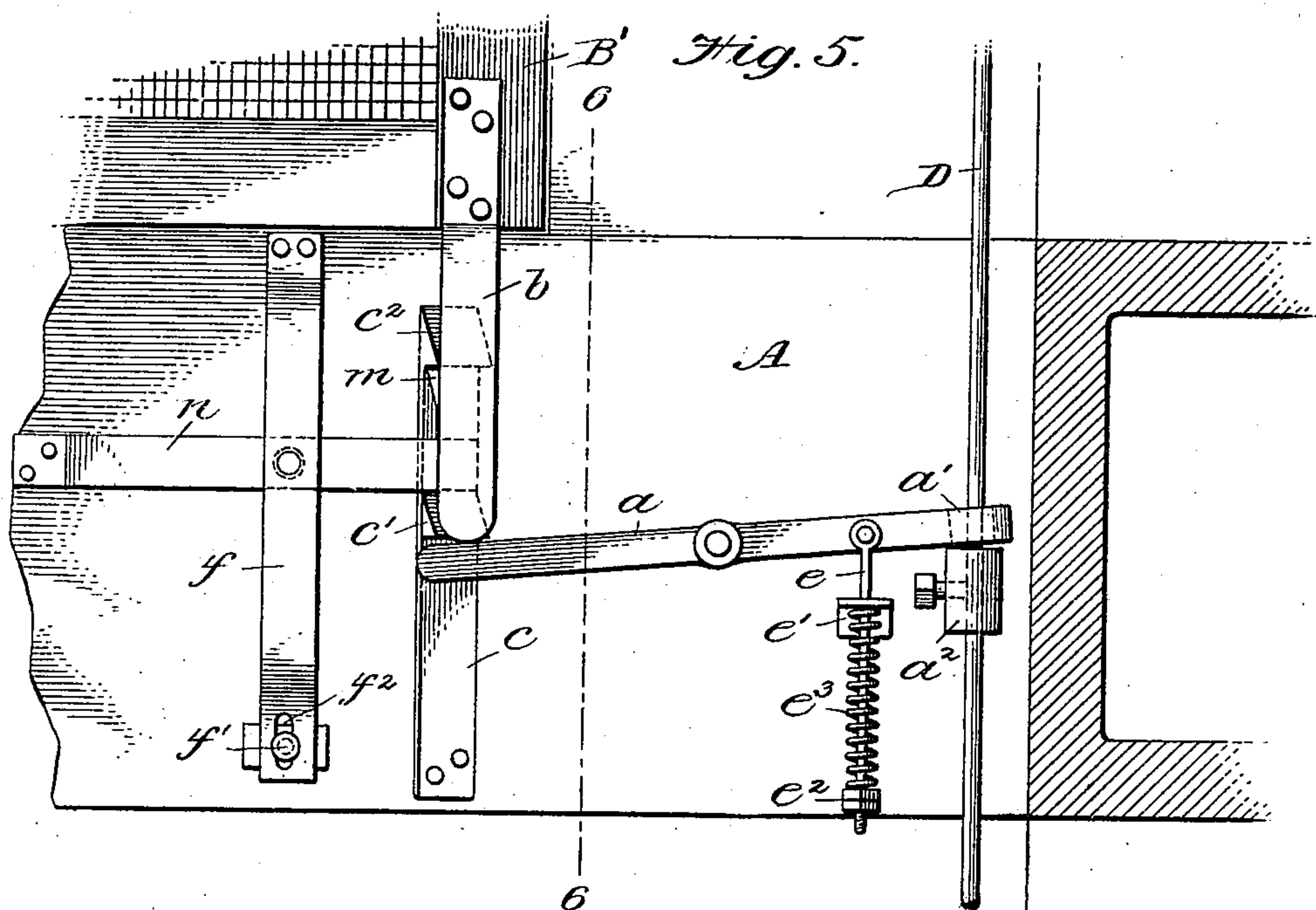
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ELEVATOR.

(No Model.)

(Application filed May 15, 1900.)

3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

ISAAC ALLOWAYS AND JOSEPH RAMSAY, OF PHILADELPHIA, PENN-
SYLVANIA.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 667,281, dated February 5, 1901.

Application filed May 15, 1900. Serial No. 16,741. (No model.)

To all whom it may concern:

Be it known that we, ISAAC ALLOWAYS and JOSEPH RAMSAY, citizens of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Elevators, of which the following is a full, clear, and concise description, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to certain improvements in elevators, and particularly to an automatic locking device such as hereinafter fully described.

The principal object of this invention is to provide mechanism for automatically locking the elevator car against movement either up or down simultaneously with the opening of the landing-door, so as to prevent accidents due to the carelessness of the operator in starting the car while the door is open and leaving the door open after the car has passed the floor.

A further object of this invention is to provide mechanism for preventing the landing-doors from being opened either from the inside or outside of the hatchway until the car is at the proper position in front of the landing.

With these objects in view our invention consists in the construction and arrangement of the different parts, such as will be hereinafter fully described, and particularly pointed in the claims made hereto.

In order to enable others skilled in the art to which our invention most nearly appertains to understand and use the same, we will now proceed to describe it in detail, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a portion of the hatchway of an elevator at the floor-line looking from the interior of said hatchway and illustrating a portion of the landing-door. Fig. 2 is a sectional elevation taken transversely to Fig. 1, about on the line 2 2 in said figure, showing a portion of the elevator-car directly opposite the landing. Fig. 3 is a detail perspective of a spring-latch which forms a part of the locking mechanism. Fig. 4 is a sectional elevation illustrating an elevator-hatchway, showing two floors, the landing-door being open in one instance and closed in the

other, while the elevator-controlling mechanism is locked against movement. Fig. 5 is a side elevation similar to Fig. 1, illustrating a modified construction for use on vertically-sliding doors, such as are used on freight-elevators. Fig. 6 is a section taken about on the line 6 6 of Fig. 5, transversely to the same.

The elevator-car and controlling mechanism may be of any of the well-known constructions, and this invention may be applied thereto without changing or altering the parts in any manner.

In said drawings, A designates the joist between the floors, B the landing-door, and C the elevator-car.

D is a metallic rod running the full length of the elevator-shaft, which is pivoted at its lower end to a transversely-arranged pivoted rod d , carrying near its free end the lugs d' , which when the rod D is shifted downwardly serve to lock the operating-valve wheel E and prevent the operation of the motor mechanism until the rod d is raised. The lugs d' are rounded or cam-shaped on their lower faces, as shown at d^2 , so that in the event of the rod d being dropped by accident, caused by the breaking of any of the mechanism or by reason of some one of the landing-doors being pried open, the pin d^3 on the valve-wheel E will act on said cam-faces and raise the lever sufficiently to allow the pin to assume the position shown in Fig. 4, which is the position assumed when the operating-valve is closed.

To the joist A, directly below the floor-line, is pivoted a bell-crank lever a , having provided in the end of its horizontal arm an eye a' , through which passes the vertical rod D. Directly below this arm of the bell-crank is a sleeve or nut a^2 , which surrounds the rod D and is secured rigidly thereon by means of a set-screw a^3 . The vertical arm of the bell-crank a is provided on its lower end with an enlarged edge, as a^4 , against which bears the lug b' , formed on the arm b , which is secured to the lower forward corner of the landing-door B.

Secured at one end to the joist A is a spring-lever c , having two locking projections c' c^2 formed on its outer face near its free end, the one c' being adapted to engage the edge of the bell-crank a and hold it in normal position

and the one c^2 being adapted to engage the rear edge of the arm b and hold the door B closed and locked against movement until the latch c is depressed.

5 The horizontal arm of the bell-crank a has pivoted thereto about midway of its length a rod e , which passes through a bracket e' , secured to the wall or joist A. The lower end of this rod is threaded and carries the jam-
10 nuts e^2 . Between the jam-nuts e^2 and the bracket e' is a stiff coil-spring e^3 , under tension and adapted when the projection b' is removed from the end a^4 of the bell-crank to draw down the horizontal arm of said bell-
15 crank, and thereby shift the rod D downwardly.

On the outside of the bell-crank a we provide a flat spring f , rigidly secured at its upper end to a projection carried by the wall or
20 joist A and having its lower end secured by means of a bolt f' , which passes through the slot f^2 and enters a block or projection formed on the joist A. Secured to the rear side of the spring f is a projecting boss f^3 , which bears
25 against the latch-lever c , so that when the spring f is depressed the lever c will also be depressed and the lower bell-crank arm a and arm b released from the locking projections c' and c^2 .

30 On the bottom of the elevator-car we provide a pair of suitable hangers g , which support a sliding rod g' , carrying on its outer end a roller g^2 , adapted to bear on the outside of the spring f . A bell-crank lever h is
35 pivoted to the bottom of the car C in front of the bracket g , having the lower end of its vertical arm provided with a slot h' , which fits over a pin h^2 , carried by the end of the sliding rod g' . The horizontal end of the
40 bell-crank is pivoted at h^3 to a rod i , which passes up through the floor of the car C. A socket-plate i' is provided around the rod i for supporting the coil-spring j , the upper end of said spring bearing against the head
45 j' , carried by the upper end of the rod i . It will thus be readily seen and understood that as soon as the car C reaches a position in front of the landing-door B the sliding rod g' , carrying the roller g^2 , will be in about the
50 center of the flat spring f , and the operator, by depressing the foot-rod i , causes the bell-crank h to operate and slide the rod g' and its roller g^2 against the spring f and depress the same. This movement depresses the
55 latch-lever c through the medium of the projecting boss f^3 and releases the bell-crank a and also the depending arm b , carried by the landing-door B, and permits the said door's being opened. As soon as the door B is opened
60 the depending arm b and its projection b' are moved away from the contact with the lower arm of the bell-crank a , and the spring e^3 , carried by rod e , will operate to pull down the upper end of the bell-crank a . This action will cause the vertical rod D to be shifted
65 downwardly by reason of the connection between said rod and the bell-crank. The

downward movement of the rod D drops the lever d and stops and holds the controlling mechanism of the elevator in a locked position. The upper end of the rod D is pivoted
70 to a lever l , located at the top of the elevator-shaft. This lever is pivoted to the wall of the elevator-shaft and carries on its free end a weight l' , sufficiently heavy to counterbal-
75 ance the weight on the rod D after said rod has been released by the bell-crank levers a , so that when the elevator-door is closed and the bell-crank returned to the position shown in Fig. 1 of the drawings the rod D will be
80 returned to normal position and the elevator-running mechanism released from its locked position, so that the car can be operated.

From the foregoing description it will be readily seen that when the landing-doors are
85 closed the motor or controlling mechanism which drives the elevator-car can be operated at will and all of the said doors are locked securely against movement and can only be released by the mechanism carried by the
90 floor of the car. This mechanism will only operate to release said doors when the car-floor is on a level with the landing-floor or within a very short distance of the same. When this position is reached, the operator
95 only has to compress the foot-piece j , when the locking mechanism of the door is immediately released, and simultaneously with this operation the controlling mechanism of the elevator is locked against movement, thus
100 completely preventing the car from being moved either up or down until the landing-door has been again closed. The reclosing of the door immediately releases the elevator-controlling mechanism and the car is again
105 at liberty to move in either direction at the will of the operator.

In Figs. 5 and 6 of the drawings we have shown a slightly different arrangement of mechanism, the same being adapted to a ver-
110 tically-moving door, such as ordinarily used for freight-elevators. In this construction the arm b , which is secured to the lower end of the door B', is provided on its inner side with a beveled lug m , adapted to engage a
115 latch c^2 , carried on the end of the spring-lever c , which in this instance is vertically arranged instead of horizontally, as in the previously-described construction. A spring-rod n , pivoted at one end, has its free end
120 bearing against the latch-lever c , and in front of this rod n is a vertical spring-rod f , rigidly secured at its upper end to a block on the joist A, while its lower end is adjustably held by means of the pin f' , passing through the
125 slot f^2 . A boss or sleeve f^3 is secured to the under side of this lever and bears against the spring-rod n . On the latch-lever c is a second lug c' , which normally bears against the lever a , which is pivoted at about its center
130 to the joist A. The other end of this lever a is provided with an eye a' , through which passes the vertical rod D, which controls the motor mechanism in the basement. The nut

or collar a^2 is secured to the rod D below the lever a , as illustrated. The rod e is pivoted to the arm a and passes through the bracket e' and has on its lower end the jam-nuts e^2 .

5 Between the bracket e' and the nuts e^2 is the coil-spring e^3 , all of which operate substantially as hereinbefore described. The car in this instance is equipped with the mechanism substantially as shown in Fig. 2 of the drawings and heretofore described. So it will not be necessary to again describe this mechanism. The operation of this modified form of our invention is substantially the same as in the first-described instance. When the car reaches the proper stopping place opposite the landing-door, the lever g' is operated by means of the foot-piece j' and the spring f is compressed, which action compresses the spring-rod n , and consequently depresses the latch-lever c , which releases the latch c^2 from the lug m , carried by the arm b , thereby leaving the door B' free to be raised and opened. As soon as the lever c is depressed the latch c' also moves away from over the free end of the lever a , and the spring e^3 will then immediately act to throw or pull down the end of the lever a which is secured to the rod D, and thus shift this rod downwardly and lock the elevator-controlling mechanism. As soon as the door is closed the arm b engages the free end of the arm a and throws this down to normal position, thus releasing the controlling mechanism by allowing the rod D to return to normal position through the action of the weight l' . The beveled lug m will again engage the latch c^2 , while the latch c' engages the end of the arm a , thus securely locking the landing-door and allowing the elevator-car to again start.

40 We do not desire to limit ourselves to the precise details of construction illustrated and described herein, but hold that various slight changes might be made without departing from the spirit and scope of our invention.

45 Having thus fully described the nature of our invention, what we claim, and desire to secure by Letters Patent, is—

1. In an elevator, the combination of the car, controlling mechanism for running the same, a vertical rod extending the length of the elevator-shaft, mechanism connected with the said rod for locking the controlling mechanism, a lever pivoted to the wall of the shaft adjacent to the landing, a connection between the said lever and the vertical rod, a depending arm carried by the landing-door, mechanism for locking the pivoted lever and depending arm, mechanism operated from the elevator-car for unlocking the pivoted lever and depending arm simultaneously, and mechanism connected with the pivoted lever for actuating the same after it has been released to lock the car-controlling mechanism simultaneously with the opening of the landing-door, substantially as described.

2. In an elevator, the combination of the car, controlling mechanism for running the

same, a vertical rod extending the length of the shaft, mechanism connected with the lower end of said rod for locking the controlling mechanism, a lever pivoted to the wall of the shaft having one end engaging the vertical rod, a depending arm carried by the landing-door, a latch-lever adapted to engage and lock the depending arm and the pivoted lever, means operated from the car for depressing said latch-lever to release the depending arm and pivoted lever, and a spring connected with the pivoted lever adapted to actuate the vertical rod and lock the car-controlling mechanism simultaneously with the opening of the door, substantially as described.

3. The combination with the driving mechanism of an elevator, a vertical rod extending the length of the elevator-shaft having connecting mechanism for locking the driving mechanism when said rod is shifted downwardly, a lever pivoted to the wall of the shaft below each landing-door having one end connected to the vertical rod, a spring adapted to throw said lever downwardly when the same is released, a depending arm carried by the landing-door, a spring latch-lever having one latch adapted to engage and hold the pivoted lever in normal position and a second latch adapted to engage and to hold the depending arm on the door, a projecting spring extending from the shaft-wall having a connection with the latch-lever, a sliding rod carried by the elevator-car, and mechanism for operating said rod to depress the projecting spring, substantially as described and for the purpose stated.

4. The combination with the driving mechanism of an elevator, a vertical rod extending the length of the shaft having a connection at its lower end with the driving mechanism whereby upon the shifting of said rod in a downward direction the driving mechanism is locked, a weight connected with the upper end of said rod adapted to return the same to normal position, a lever pivoted to the wall of the shaft at each landing having one connected to the vertical rod, a depending arm carried by the landing-door, a spring latch-lever adapted to engage the pivoted lever and the depending arm, a sliding rod carried by the elevator-car adapted when operated to actuate the latch-lever and release the depending arm and pivoted lever, and a foot-lever extending through the car-floor for operating the sliding rod, substantially as described.

5. The combination of the elevator-controlling mechanism, a vertical rod for locking and releasing the controlling mechanism, a bell-crank lever pivoted to the wall of the shaft below the landing, a connection between one arm of said lever and the vertical rod, a depending arm carried by the elevator-door, mechanism for locking the bell-crank lever and the depending arm, mechanism operated from the elevator-car for unlocking the bell-crank and the door-arm simultaneously, and

a spring adapted to act on the bell-crank lever and throw the same downwardly immediately after it has been released, for the purpose of shifting the vertical rod and locking the controlling mechanism of the elevator.

6. The combination with the vertical rod D, of mechanism connected with the lower end thereof for locking and releasing the elevator-controlling mechanism, a bell-crank lever *a* pivoted to the wall of the elevator-shaft below the landing, having one arm connected to the rod D, an arm *b* depending from the elevator-door, a spring-lever *c* secured at one end to the wall of the shaft, a pair of latches formed on said lever adapted to engage and lock the arm *b* and lower arm of the bell-crank when the landing-door is closed, mechanism operated from the elevator-car for unlocking the bell-crank and the door-arm simultaneously and a spring connected with the horizontal arm of the bell-crank adapted to throw the same downwardly when it has been released, for the purpose substantially as described.

7. The combination of the rod D having mechanism connected at its lower end for locking the controlling mechanism when the same is shifted, a bell-crank lever *a* pivoted to the side wall of the elevator-shaft, a slot *a'* formed in the end of the horizontal arm of said lever adapted to surround the rod D a collar *a²* secured on the rod D below the bell-crank arm, a depending arm *b* carried by the landing-door, a spring latch-lever secured at one end to the wall of the shaft having latches *c'* and *c²* adapted to engage the lower arm of lever *a* and the arm *b* respectively, a spring *e³* connected with the horizontal arm of the bell-crank, an outwardly-projecting spring *f*, connected near its center with the latch-lever *c* and mechanism operated from the elevator-car for depressing said spring and simulta-

neously unlocking the elevator-door and locking the controlling mechanism of the elevator, substantially as described.

8. The combination with the rod D of the pivoted bell-crank lever *a* having its horizontal arm connected to the said rod, a rod *e* pivoted to said bell-crank, a bracket *e'* secured to the wall of the elevator-shaft through which said rod *e* passes, lock-nuts *e²* threaded on the end of rod *e* a coil-spring interposed between the bracket *e'* and the nut *e²* depending arm *b* carried by the landing-door, a latch-lever *c* adapted to engage and lock said arm *b* and the lower end of the bell-crank, a bowed spring *f* extending in the front of the latch-lever, a connection between said bowed spring and the latch, and a lever *g'* carried by the car adapted when operated to press the spring *f* and release the latch-lever from engagement with the arm *b* and lever *a*, substantially as described.

9. In an elevator, the combination with the controlling mechanism, of a rod D running the length of the elevator-shaft, a rod *d* pivoted at one end having the rod D pivoted thereto, a wheel E connected with the operating device of the elevator, a projecting pin carried by said wheel, a pair of lugs or stops carried by the pivoted rod *d* having cam-shaped lower faces and mechanism connected with the rod D for locking the operating-wheel as the landing-doors are opened and for releasing the same when said doors are closed, substantially as described.

In witness whereof we have hereunto set our hands this 10th day of May, A. D. 1900.

ISAAC ALLOWAYS.
JOS. RAMSAY.

Witnesses:

ELTON W. LUCAS,
FRANK FEENEY.