

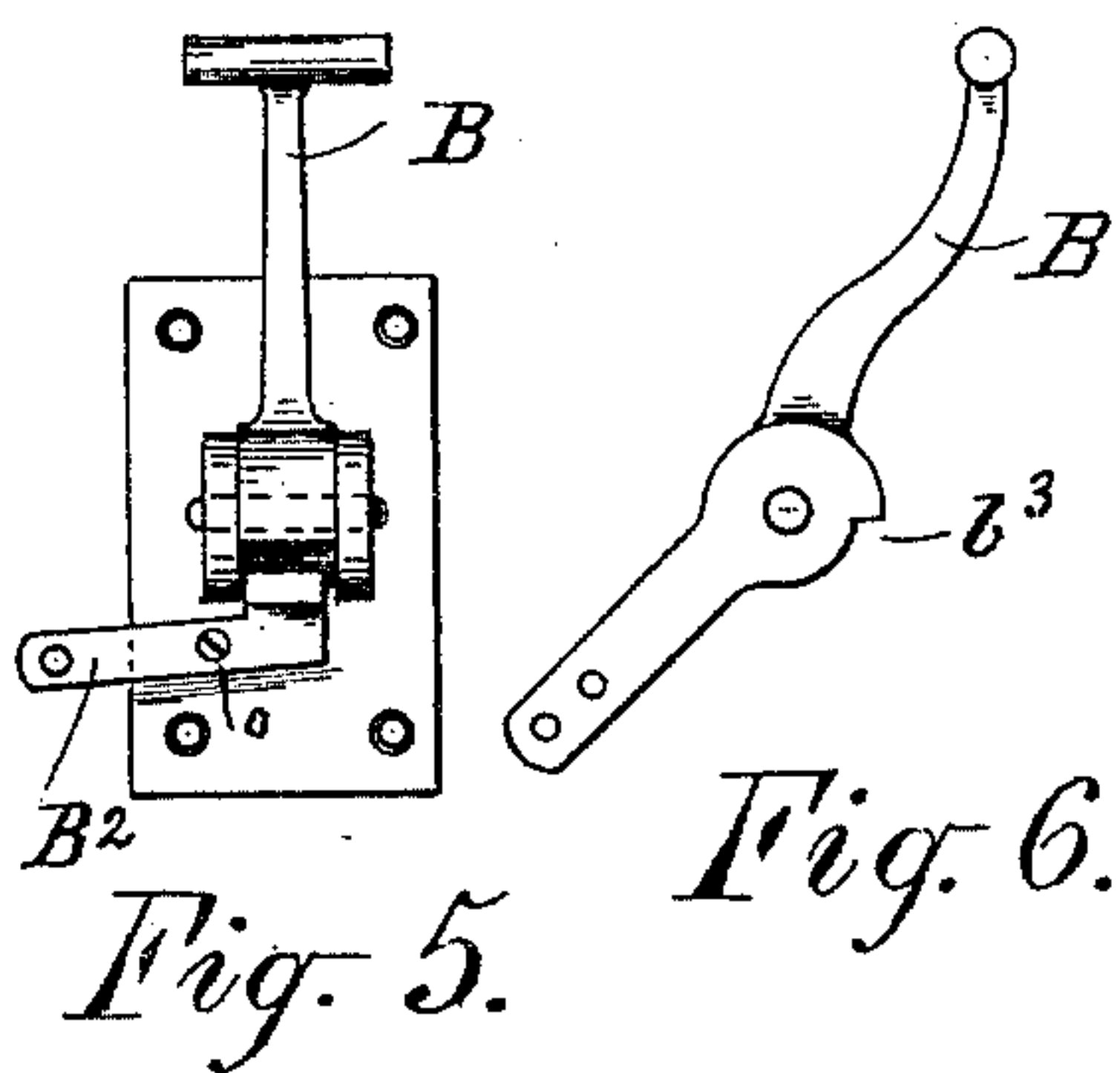
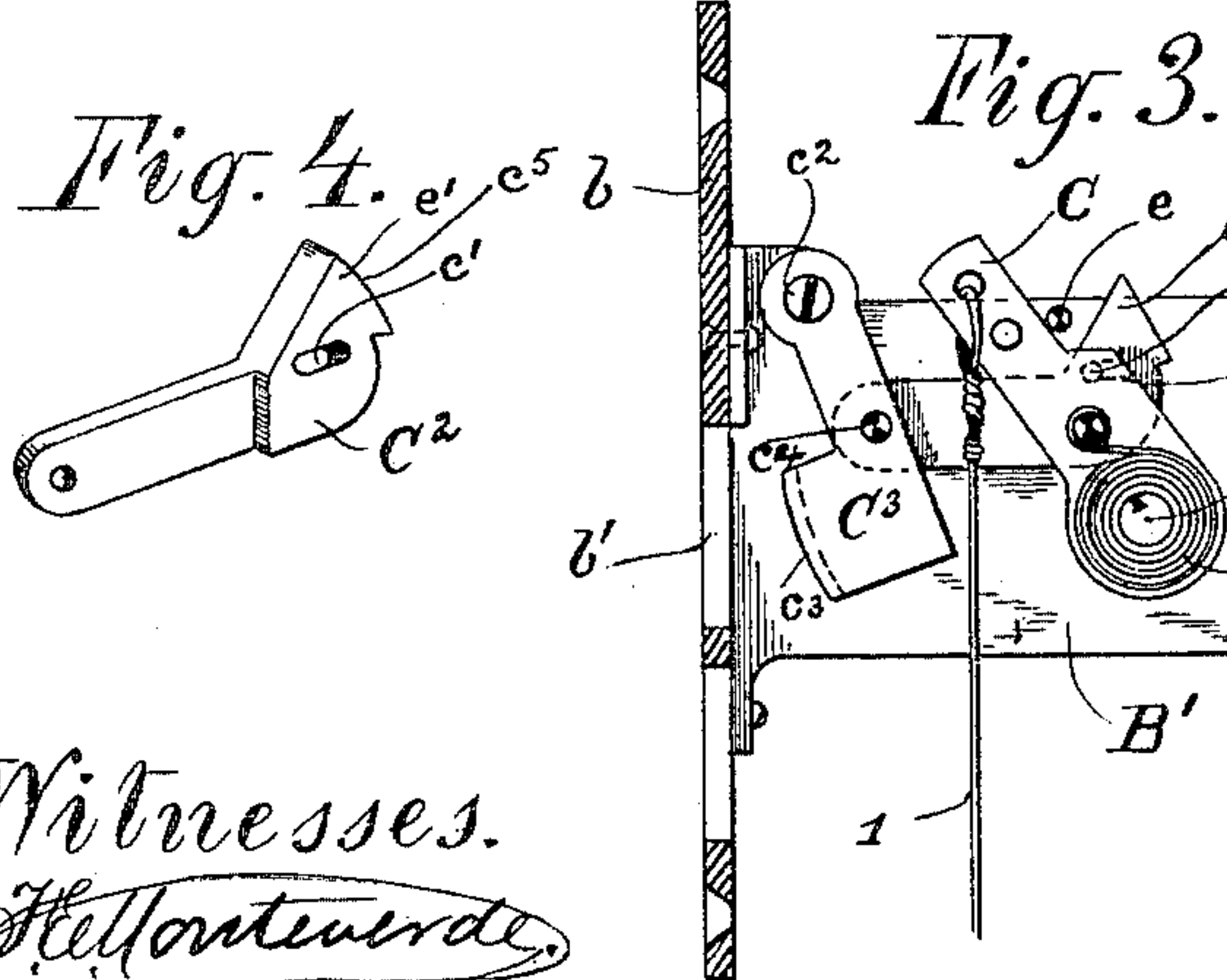
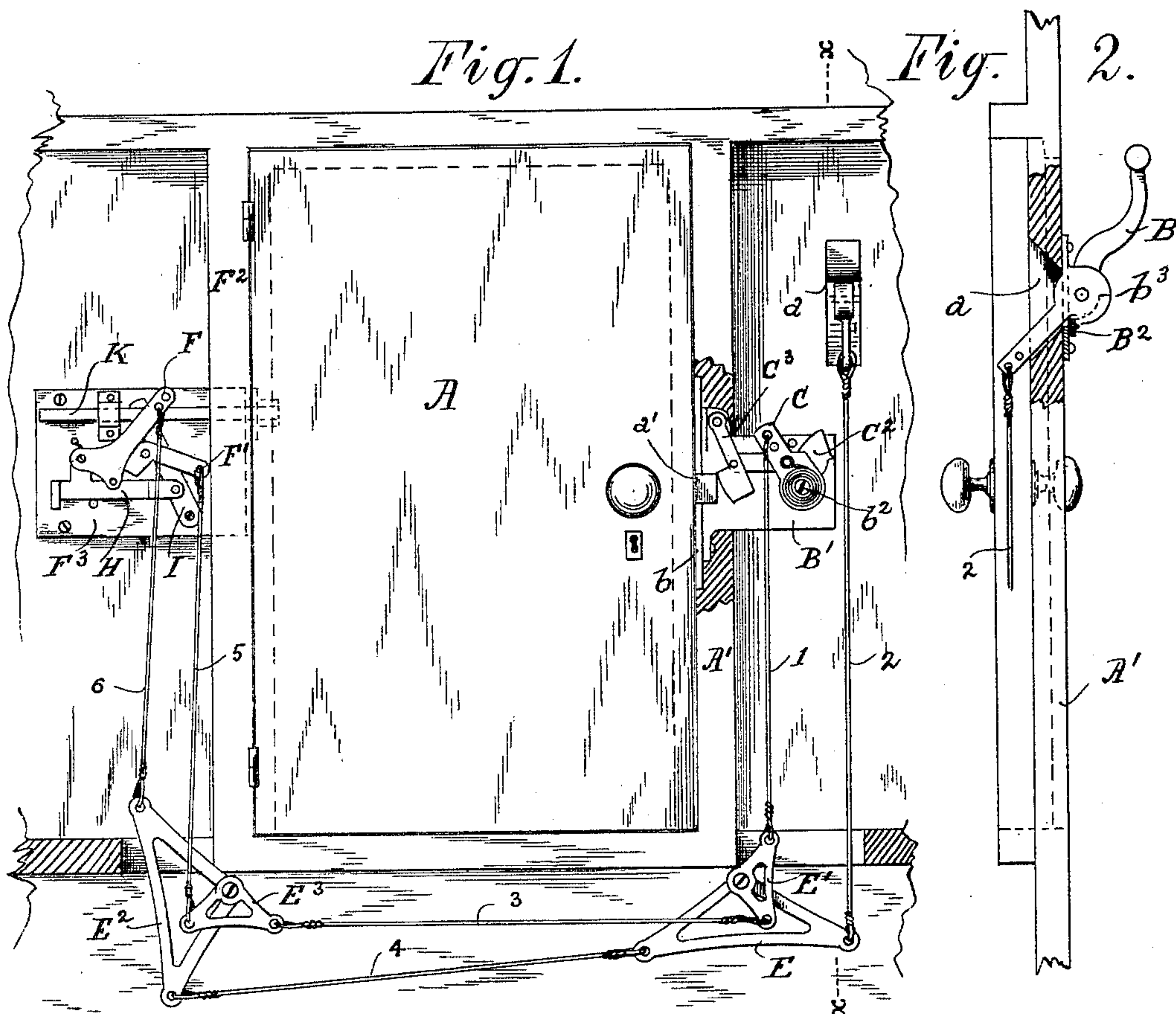
(No Model.)

3 Sheets—Sheet 1.

J. FINCK.  
DOOR OPENER AND CLOSER.

No. 460,820.

Patented Oct. 6, 1891.



Witnesses.  
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Master  
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*Julius Finck*  
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(No Model.)

3 Sheets—Sheet 3.

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Fig. 11

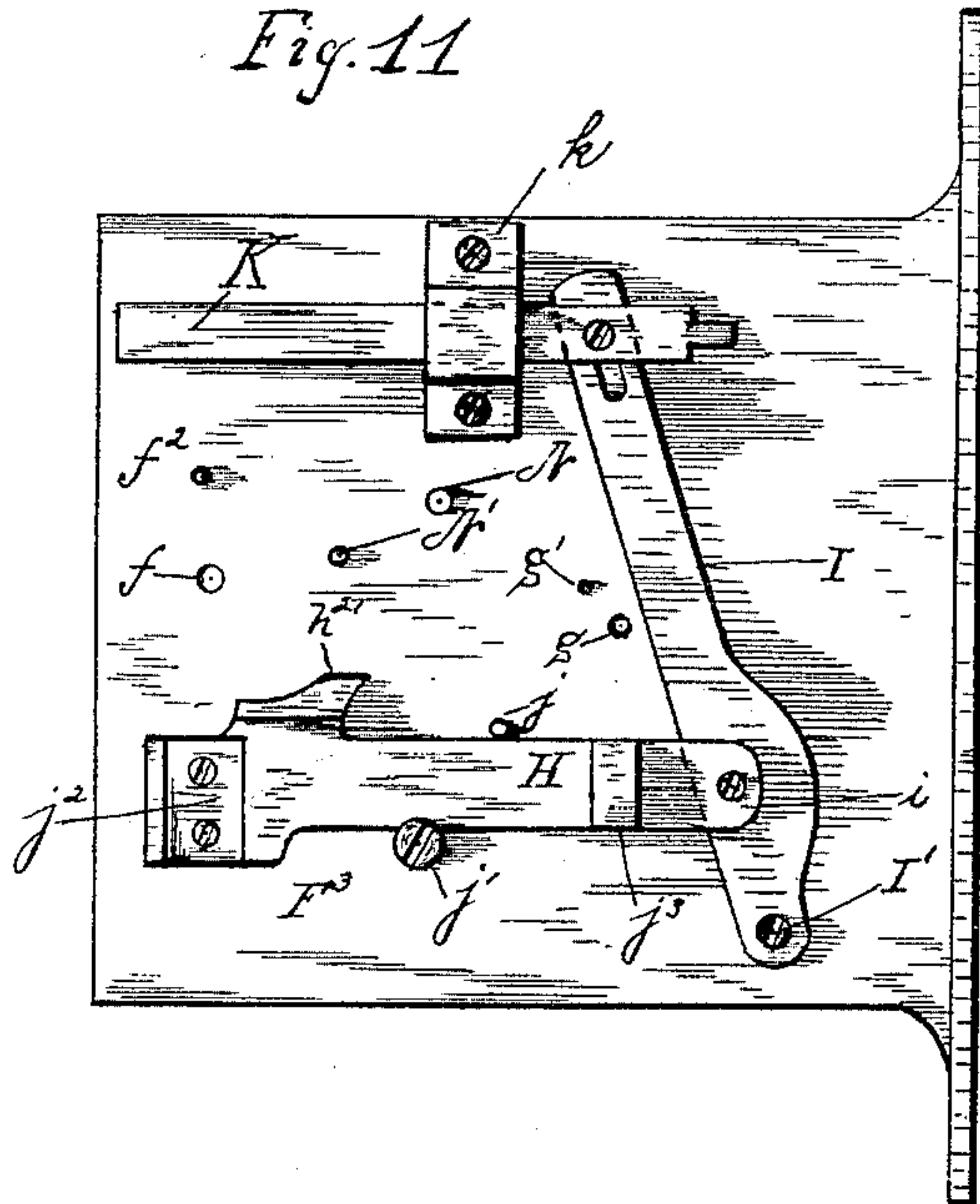


Fig 12.

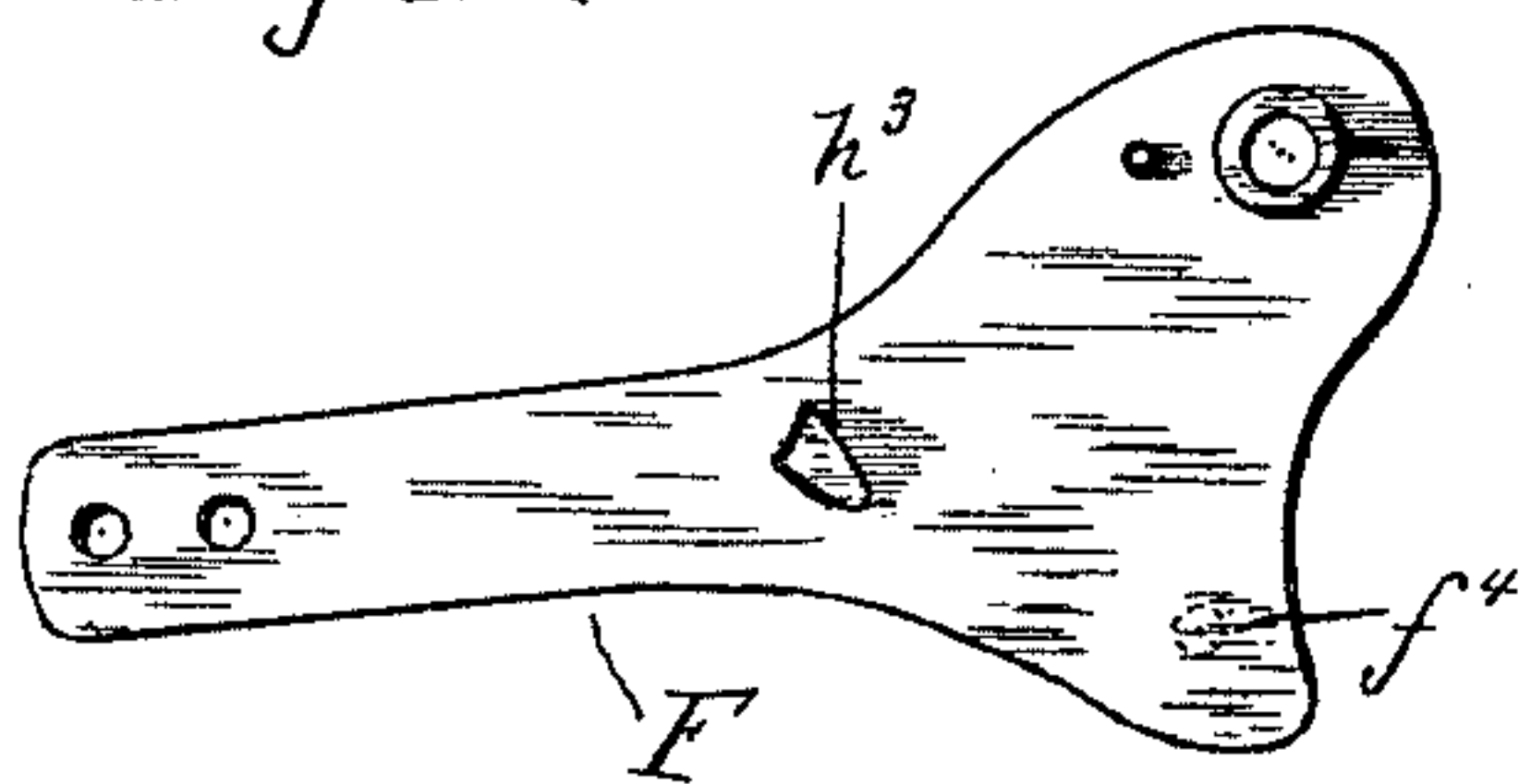
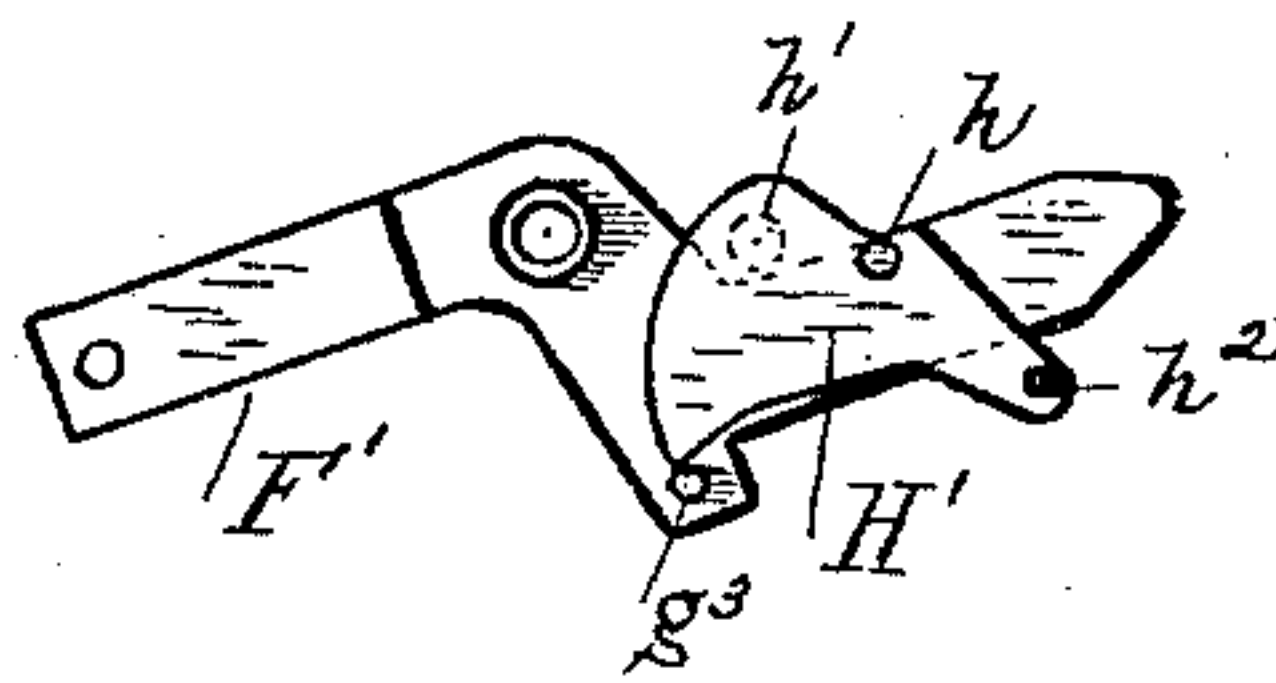


Fig. 13.



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# UNITED STATES PATENT OFFICE.

JULIUS FINCK, OF SAN FRANCISCO, CALIFORNIA.

## DOOR OPENER AND CLOSER.

SPECIFICATION forming part of Letters Patent No. 460,820, dated October 6, 1891.

Application filed June 27, 1890. Serial No. 356,932. (No model.)

*To all whom it may concern:*

Be it known that I, JULIUS FINCK, a citizen of the United States, residing at the city and in the county of San Francisco, and State of California, have invented certain new and useful Improvements in Mechanical Door Openers and Closers; and I do hereby declare the following to be a full, clear, and exact description of said invention, such as will enable others skilled in the art to which it most nearly appertains to make, use, and practice the same.

This invention has relation to certain new and useful improvements in a mechanical opener and closer for doors; and it consists of the parts and details of construction, as will be hereinafter more fully set forth in the drawings and described and pointed out in the specification.

My invention is adapted more especially for use in connection with tenement-flats, so as to enable persons occupying the second or third floor to readily open or close the outer door without necessitating the going down stairs for such purpose, thereby saving great labor and time to the occupants by providing against the unnecessary running to the door in order to ascertain the cause of ringing the bell.

The object of my invention consists in providing a device which shall be simple in its construction, effective in its operation, and less expensive than any device of a similar nature heretofore known to me.

Referring to the drawings forming a part of this application, in which similar letters and figures of reference are used to denote corresponding parts throughout the entire specification and several views of the drawings, Figure 1 is a view in elevation showing a portion of the door-casing removed for the purpose of more fully illustrating the operating mechanism; Fig. 2, a vertical sectional view taken on line *x x*, Fig. 1; Fig. 3, a detail view of the door-catch operator; Fig. 4, a detail view showing one of the operating-levers or connecting-rod, shown more fully in Fig. 3; Fig. 5, a front detail view of the operating-handle and stop; Fig. 6, a detached detail of the operating-handle; Fig. 7, a detail view showing the mechanism in position for opening the door; Fig. 8, a similar view

showing the stroke of the operating-lever necessary to cause the opening of the door; Fig. 9, a similar view showing position assumed by several parts when door is open, the same being in position to permit the down-stroke of the operating-lever in order to close the door; Fig. 10, a detail view showing door open and its connection with the operating-rod. Fig. 11 is a front elevation of plate *F*<sup>3</sup>, with the levers *F* and *F'* and the movable disk *H'* removed, the parts which are shown occupying the same position as in Fig. 7. Fig. 12 is a rear elevation of lever *F*; and Fig. 13 is a rear elevation of lever *F'*, showing the movable disk pivoted thereto.

The letter *A* is used to indicate an ordinary door, and *B* the operating-handle passing through opening *a*, formed in the door-jamb *A'*. The handle is shown as attached to the door-jamb merely for the purpose of better illustrating the working thereof. In practice the same will be located at the head of the stairway. To the jamb *A'*, upon the inside thereof, I secure the plate *B'*, which is provided with the face-piece *b*, adapted to be flush with the face of said jamb. An opening *b'* is formed in said plate, within which the door-catch *a'* fits. Projecting from the inner face of the plate *B'* is the lug *b*<sup>2</sup>, upon which the lever *C* is secured and revolves. I also secure upon said lug, in front of lever *C*, the spring *C'*, which has its free end attached to the lever *C*. Said lever is attached to the sliding plate *C*<sup>2</sup> through the medium of the pin *c*. This pin works in the elongated slot *c'*, formed in said sliding plate.

The letter *C*<sup>3</sup> indicates the catch-operating lever, which is pivoted to said plate by means of the pin *c*<sup>2</sup> and is provided with the enlarged head *c*<sup>3</sup>. The downwardly-hanging catch-operating lever is attached to the sliding rod or plate *C*<sup>2</sup> by means of pin *c*<sup>4</sup>, and as the rod moves forward or backward, as hereinafter described, said lever is carried therewith. In order to provide against the lever *C* being carried too far up by the resiliency of the spring *C'*, I provide the stop or lug *e*, which serves at the same time to cause the sliding rod *C*<sup>2</sup> to move downward with its forward movement by reason of the inclined enlarged inner end *e'* coming in contact therewith.



Beneath the door-frame I locate the bell-cranks E, E', E<sup>2</sup>, and E<sup>3</sup>. The bell-cranks E' and E<sup>3</sup> are considerably smaller than the ones E E<sup>2</sup>, and are secured in front thereof upon the same bolt or projection, as clearly shown. I secure to said bell-cranks the wires 1, 2, 3, 4, 5, and 6. The wire 2 is secured to bell-crank E and inner end of the operating-handle B, while the wire 1 is secured to bell-crank E' and end of operating-lever C. Wires 4 and 3 connect, respectively, with bell-cranks E E<sup>2</sup> and E' E<sup>3</sup>, as clearly indicated in Fig. 1. The wires 6 and 5 connect, respectively, with levers F F'.

The letter F<sup>3</sup> represents the plate secured to the rear of the door-jamb F<sup>2</sup>, and to which the hereinafter-described operating mechanism is secured. Upon the projecting lug *f*, I locate the sleeve, (not shown,) and to said sleeve I secure the spring *f'*, the free end of which I attach to the lug *f*<sup>2</sup>, located above said lug *f*. I also secure to the sleeve working upon the projecting lug *f* the operating-lever F in front of the spring *f'*. Said lever is provided with the downwardly-projecting portion *f*<sup>3</sup> and has secured thereto the inwardly-projecting lug or pin *f*<sup>4</sup>, which is adapted to engage with the outer shoulder *j*<sup>2</sup> of the sliding rod H, as hereinafter described. The lever F' is fastened to the projecting lug *g*, which is surrounded by a spiral spring. One end of said spring I attach to the lever F' and the other to projection *g'*. To the end *g*<sup>2</sup> of said lever is secured the inwardly-projecting lug *g*<sup>3</sup>, which is adapted to engage with the inner shoulder *j*<sup>3</sup> of the sliding rod H. To the inner face of said lever is attached the movable disk H' by means of the pin *h*. Said disk is provided with outwardly and inwardly extending lugs *h*<sup>1</sup> *h*<sup>2</sup>. The operating-lever F has an inwardly-projecting lug *h*<sup>3</sup> attached thereto, which engages with the outwardly-projecting lug *h'*, secured to the disk H'. The outer end of the sliding bar or rod H has the upwardly-extending shoulder *h*<sup>21</sup> formed thereon, while the inner end is made bifurcated, so as to form arms *i*. Said rod is held in adjusted position by means of the lugs or pins *j* *j'*, secured to the plate above and below the same, and at the outer and inner ends has the shoulders *j*<sup>2</sup> *j*<sup>3</sup> formed thereon. Between the arms *i* of the sliding rod H is secured pivotally the vertical lever I. The lower end of said lever is movably secured upon the projecting lug I', while its upper end is provided with an elongated opening for the purpose of adjusting its stroke and is secured within the opening *l*, formed in the door-operating rod K. Said rod is held in position by means of the hanger *k*, and the outer end thereof is reduced in order to fit between the arms *l'*, formed by the bifurcated end of the rod L. The outer end of said rod is also bifurcated, thereby forming arms *l*<sup>2</sup>, between which the outer end of rod L' is pivotally secured by means of the pin *l*<sup>21</sup>. Said rod fits into the opening *m*, formed in the rear of the door A,

and is held in position by means of spring L<sup>2</sup>, located and secured therein.

In order to secure rapidity in the opening and closing of the door, I locate and secure the roller M within the opening *m'*, formed within the front piece M' of the plate F<sup>3</sup>, which bears against the rods L' and L as the door is opened and closed and tends to press the same tightly inward at an incline.

In order to open the door, the handle B is pressed down until the projecting shoulder *b*<sup>3</sup> of the enlarged portion comes in contact with the stop B<sup>2</sup>. With the downward movement thereof the inner end of the same is thrown upward, carrying therewith, through the medium of the wire 2, the bell-crank E, which, by reason of the wire connection 4, pulls forward the bell-crank E<sup>2</sup>, which in turn, acting upon the wire 6, causes the operating-lever F to descend. With this downward movement of lever F the movable disk H' is in the position illustrated in Fig. 7—that is to say, with its lug *h'* directly in the path of movement of lug *h*<sup>3</sup> of lever F. It therefore follows that with the continued downward movement of lever F lug *h*<sup>3</sup> will contact with lug *h'*, which will have the effect of moving disk H' upon its pivot and bring lug *h'* to bear firmly against lever F, and thereby also cause the downward movement of the outer end of said lever. The positions of the levers F and F' after the handle B' has completed its full stroke are shown in Fig. 8. When the outer end of lever F' is thus moved downward, it throws the lug *g*<sup>3</sup> thereof into engagement with the inner shoulder *j*<sup>3</sup> of bar H, thereby causing said bar to move inwardly toward the end M' of plate F<sup>3</sup>. With this movement the upper end of the vertical lever I is thrown in the same direction, which causes a similar movement of the operating-rod K and forces the door open, said door, by reason of the jointed rods L L', being allowed to swing upon its hinges. As the rod K is forced inward the roller M presses against the inclined face of rods L L', and thereby gives greater impetus to the swing of the door, and at the same time materially assists the action of the operating mechanism. As the outer end of lever F' is moved, as above described, the inner end is forced up, and by reason of the wires 5, 3, and 1 and small bell-cranks E<sup>3</sup> E' serves to cause the lever C to descend, which throws the sliding rod C<sup>2</sup> inward, and by reason of its connection with vertical lever C<sup>3</sup> the latter is forced in a like direction against the door-catch until said catch is released from engagement with the opening *h'*. When the catch is released, the door opens through the medium of the before-described mechanism. When the door is thus open, it will be seen that the sliding rod has been moved from the position shown in Fig. 7 to that shown in Fig. 9, so that the lug *h*<sup>21</sup> is farther inward. If now pressure upon the handle B be removed, lever F will fly back to its normal position and consequently withdraw the pressure of lug *h*<sup>3</sup> from *h'*, which permits



the outer end of lever  $F'$  to move upwardly, as well as the outer end of the movable disk. Inasmuch, however, as the lug  $h^{21}$  is now located farther inward, the outer end of the disk will be prevented from fully returning to its normal position by reason of lug  $h^2$  of said disk coming in contact with said lug  $h^{21}$ . Consequently lug  $h'$  of the disk is prevented from returning to its initial position and is now out of the path of movement of the lug  $h^3$  upon lever  $F$ .

If now it is desired to close the door, the outer end of stop  $B^2$ , which is fulcrumed at  $o$ , is thrown upward, so as to release the inner end from contact with the projecting shoulder  $b^3$  upon the downstroke of the handle. The handle is then pulled downward to its full extent, which necessarily throws the inner end upward and causes wire 2 to draw upward upon bell-crank  $E$ . This upward movement through the medium of bell-crank  $E^2$  and wires 4 and 6 causes the downward movement of operating-lever  $F$ , and the lug  $h^3$  not being in line with lug  $h'$  of the disk the two lugs of course will not contact and the portion  $f^3$  of lever  $F$  will be thrown into contact with shoulder  $j^2$  of the sliding bar and cause the same with the continued downward movement of said lever to slide outward to its normal position. As the sliding bar moves outward, the vertical lever  $I$ , which is secured to the inner end thereof, is drawn in the same direction, and inasmuch as said lever is connected to the operating-rod  $K$  it necessarily moves the same therewith. The rod  $K$  in turn, being connected to the rear of the door by means of the rods  $L$   $L'$ , causes the closing of the same. It is also to be noticed that as the sliding bar moves outward the lug  $h^2$ , formed on the outer end of disk  $H'$ , moves out of contact with the upwardly-extending shoulder  $h^{21}$  of the sliding rod  $H$  and allows said disk to move into its normal position, so as to cause the lug  $h'$  to move beneath lug  $h^3$ , so as to be in line of contact therewith ready for the next opening of the door.

In order to provide against the levers  $F$  and  $F'$  moving upward too far, I provide the stops  $N$   $N'$ , with which the said levers come in contact upon their upper stroke.

I am aware that minor changes may be made in the details of construction and arrangements of parts herein shown and described without creating or causing a departure from the nature and scope of my invention.

Having thus described my invention, what I claim as new, and desire to secure protection in by Letters Patent of the United States, is—

1. The combination, with the door opening and closing mechanism, of the operating-handle and handle stop or catch located beneath the handle, said handle being adapted upon a partial downward stroke to open the door and upon the full downward stroke to close the

same, substantially as and for the purpose set forth.

2. In a door-opener, the combination of a plate secured to the door-jamb, provided with a forwardly-extending lug, a spring-actuated lever turning upon said lug, a horizontally-sliding plate secured to the lever and passing through a keeper, and an inwardly-swinging catch-opener having connection with the sliding plate, substantially as set forth.

3. In a door-opener, the combination, with the spring-actuated lever  $C$  and vertical lever  $C^3$ , of the connecting-rod  $C^2$ , said rod having an opening formed therein which permits of the same working upon the pin  $c$ , and an enlarged inclined end  $e'$ , adapted to contact with lug  $e$  upon its inward movement, so as to cause the downward movement thereof, substantially as set forth and described.

4. The combination, in a door opener and closer, of the plates  $B'$  and  $F^3$ , said plates having a series of levers and sliding rods secured thereon, adapted to interwork with one another, and of the handle adapted through the medium of suitable mechanism to operate said levers and sliding rods, so as to open and close the door upon the partial or full stroke thereof, substantially as and for the purpose set forth and described.

5. In a door opener and closer, the combination, with interworking operating-levers and sliding rods secured within the frame of the door, of a series of bell-cranks located therein, wires connecting said bell-cranks with the operating-levers, and of the operating-handle adapted through the medium of suitable wires to operate the bell-cranks and levers upon the downward stroke thereof in order to open or close the door, substantially as set forth and described.

6. In a door opener and closer, the combination, with the operating spring-actuated lever  $F$ , provided with inwardly-projecting lug  $h^3$ , lever  $F'$ , disk secured to said lever, having an outwardly-projecting lug formed thereon, sliding rod  $H$ , vertical lever  $I$ , pivoted to sliding rod, and operating-rod  $K$ , secured within bracket  $k$ , having opening formed therein, within which the upper end of the vertical lever is secured, said operating-rod being secured to the door by means of the rods  $L$   $L'$ , of the mechanism for causing the downward movement of lever  $F$ , which carries therewith the lever  $F'$  and causes the inward movement of sliding rod, vertical lever, and operating-rod for opening said door, substantially as and for the purpose set forth and described.

7. The combination, with the operating-bar  $K$ , of the rods  $L$   $L'$ , pivotally connected to said bar, roller  $M$ , secured so as to bear against the faces of the inclined rods  $L$   $L'$  upon the opening or closing of the door, and the mechanism for operating said operating-bar for opening or closing the door, substantially as and for the purpose set forth and described.

8. The combination, with the operating-bar  $K$ , secured between the arms of the bifurcated



rod L, of the rod L', having its inner end pivotally secured within an opening formed in the door, spring located within said opening and adapted to hold the rod L' in an adjusted position, and the mechanism for operating said sliding bar for opening and closing the door, substantially as and for the purpose set forth and described.

9. The combination, with a sliding bar having a shoulder upon its inner end, of a spring-actuated lever having an inwardly-projecting lug adapted to engage said inner shoulder of the sliding bar upon the downstroke of the lever, a vertical lever connected at one end to the sliding bar, a door, an operating-

rod connected to the other end of the vertical lever, said operating-rod being thrown inward by the action of the sliding bar upon the vertical lever, whereby the door is opened, jointed rods connecting the door with the operating-rod, and mechanism for operating the spring-actuated lever for the purpose of closing the door, substantially as set forth.

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

JULIUS FINCK.

Witnesses:

N. A. ACKER.

E. W. TUCKER.