

No. 659,887.

Patented Oct. 16, 1900.

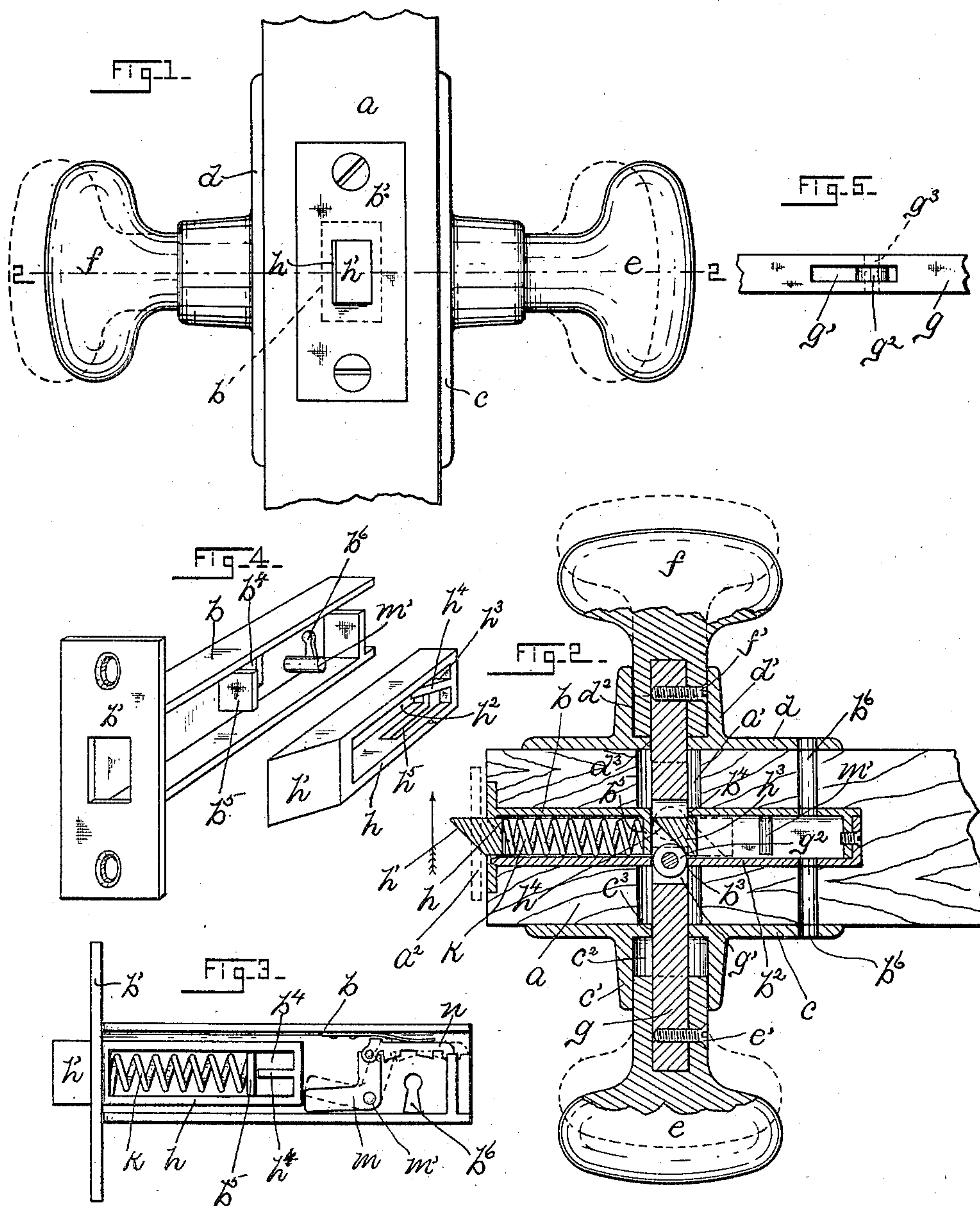
W. A. CROUCH.

KNOB LATCH.

(Application filed June 15, 1900.)

(No Model.)

2 Sheets—Sheet 1:



WITNESSES

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2 Sheets—Sheet 2.

Fig. 6.

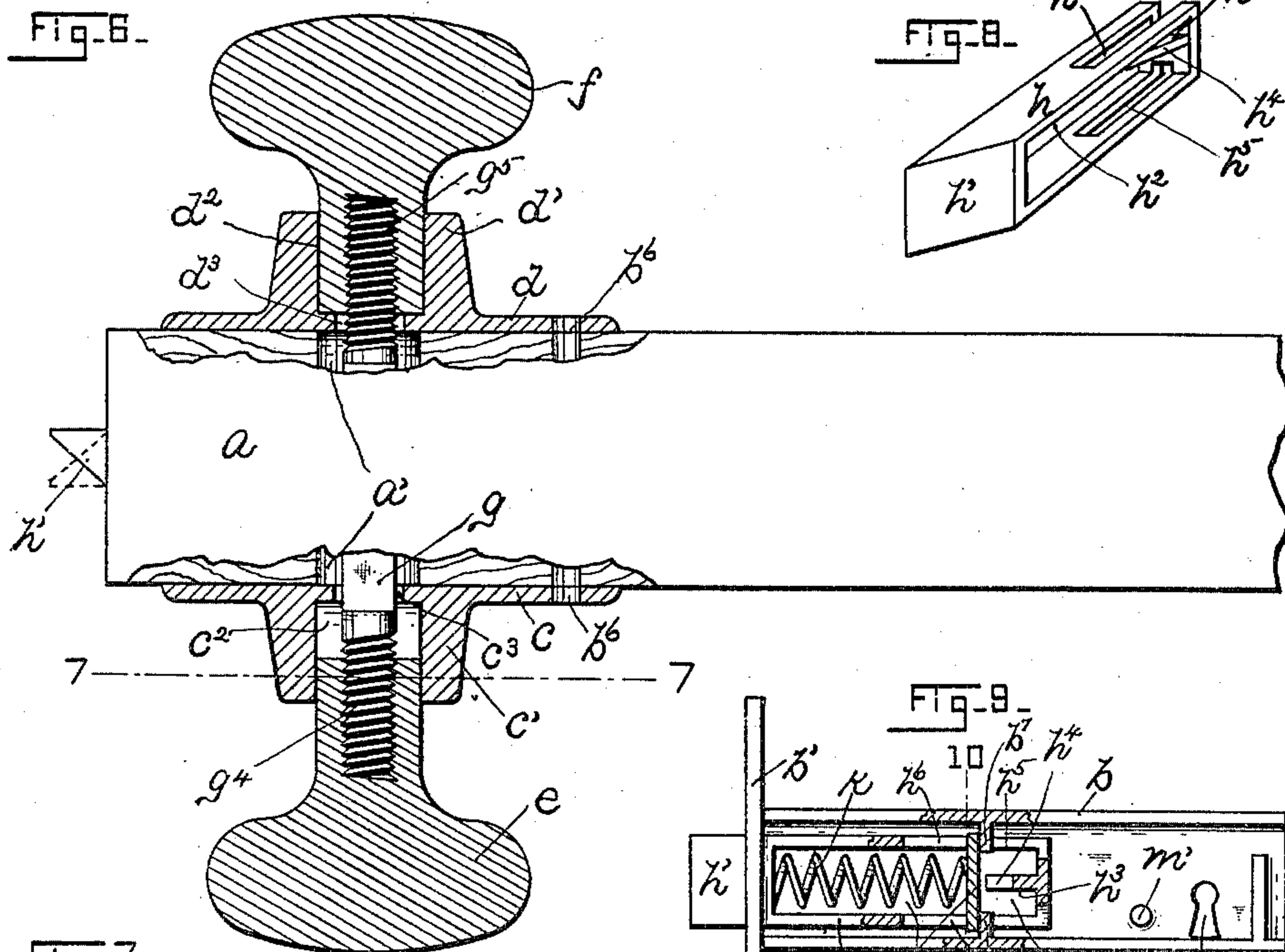
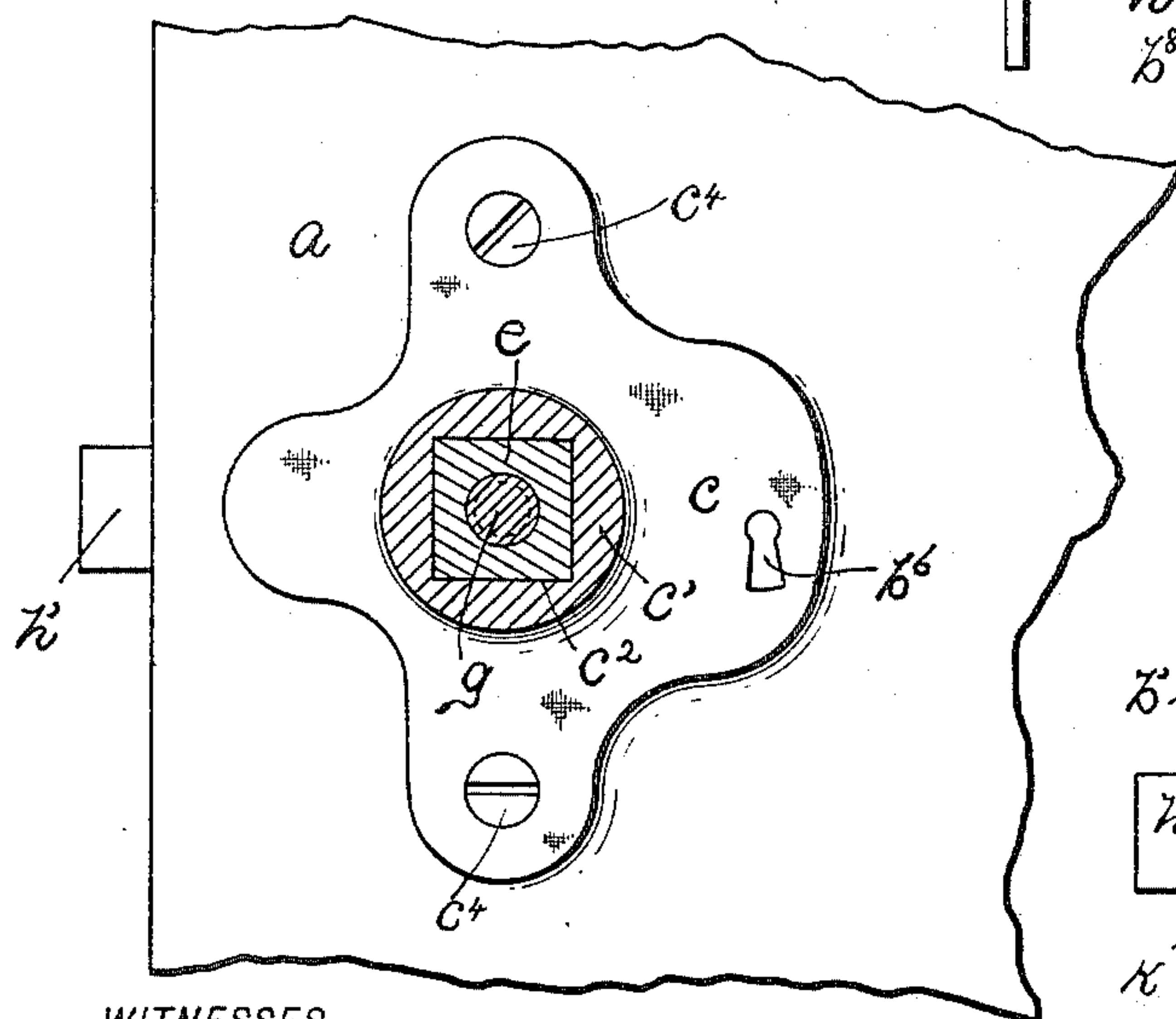


Fig-7.



WITNESSES

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Fig. 8.

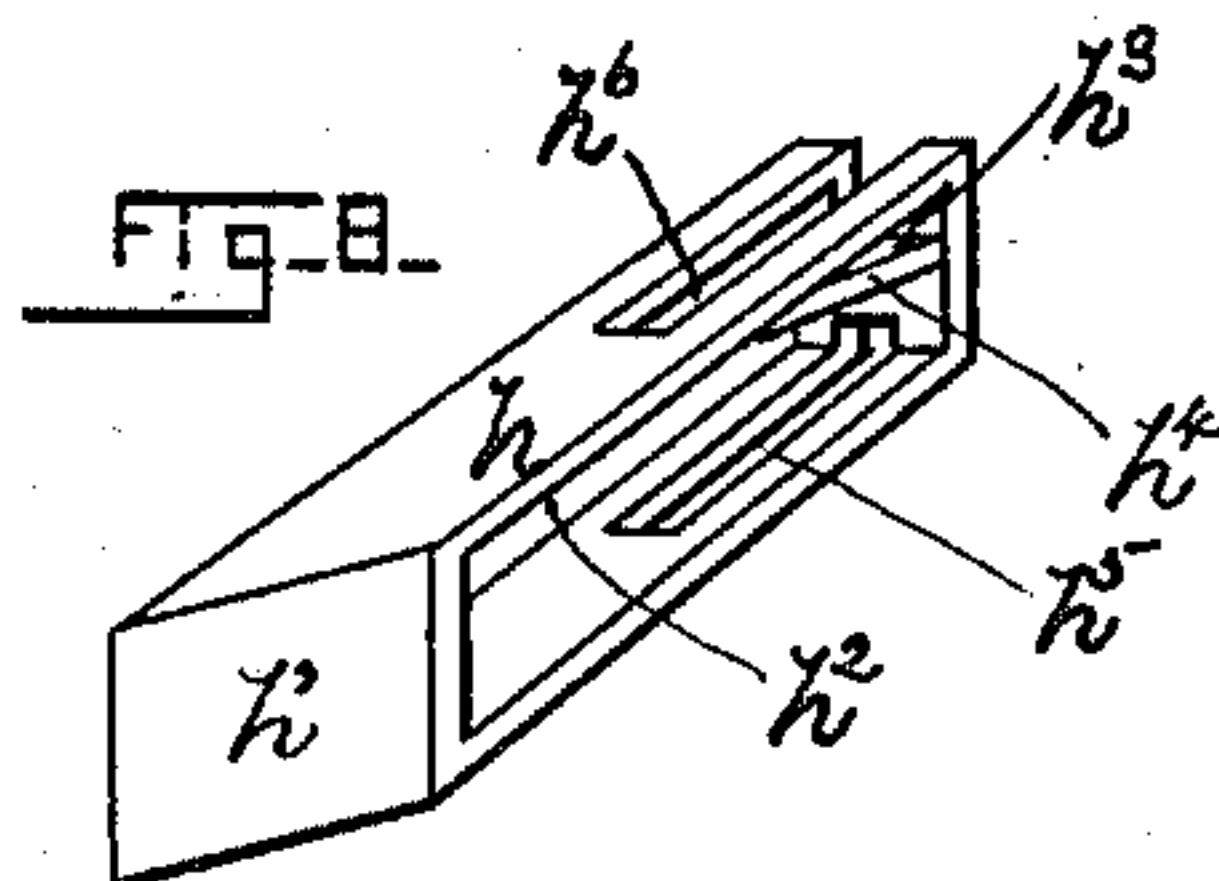


Fig-9.

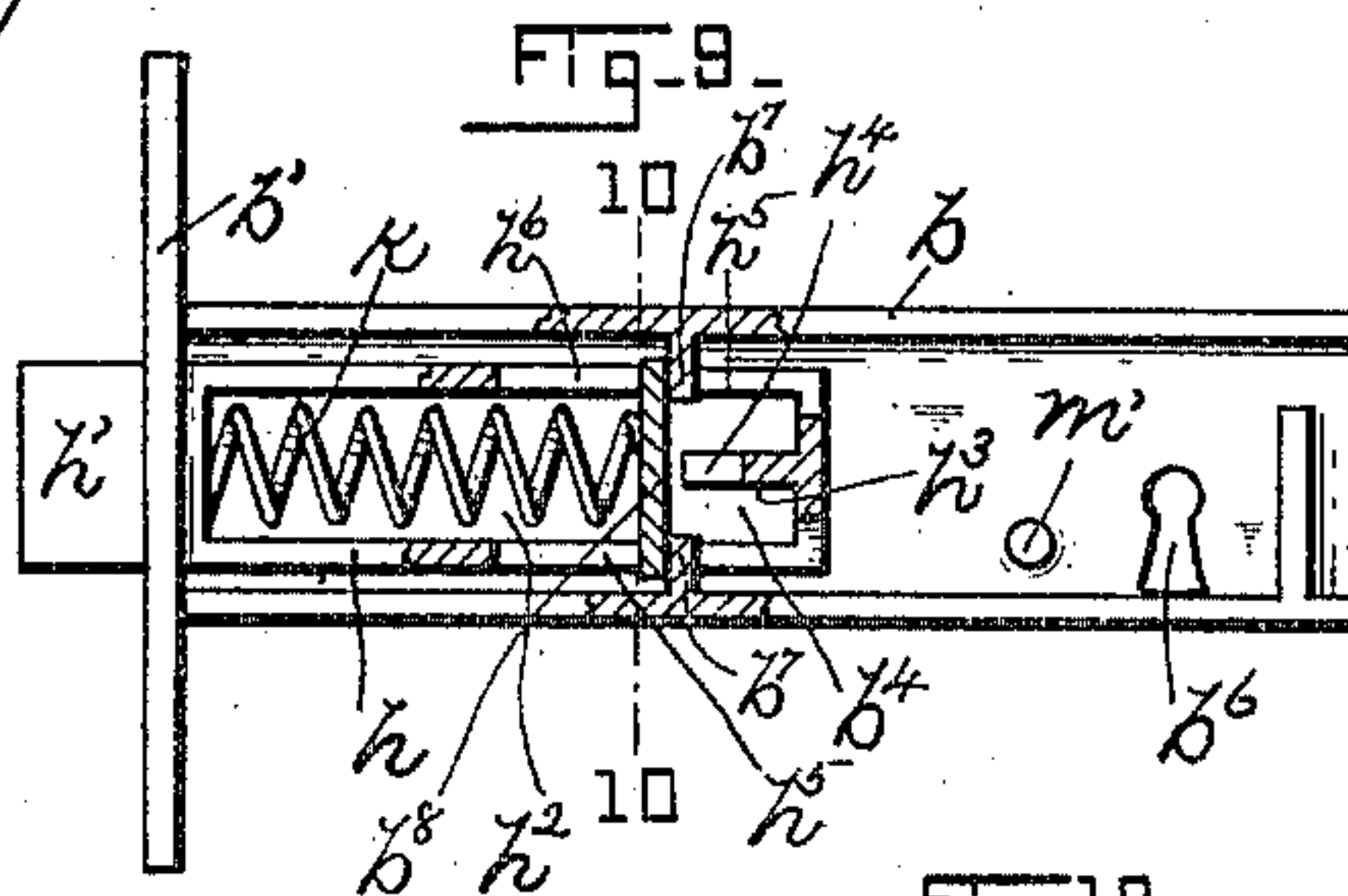


Fig. 10

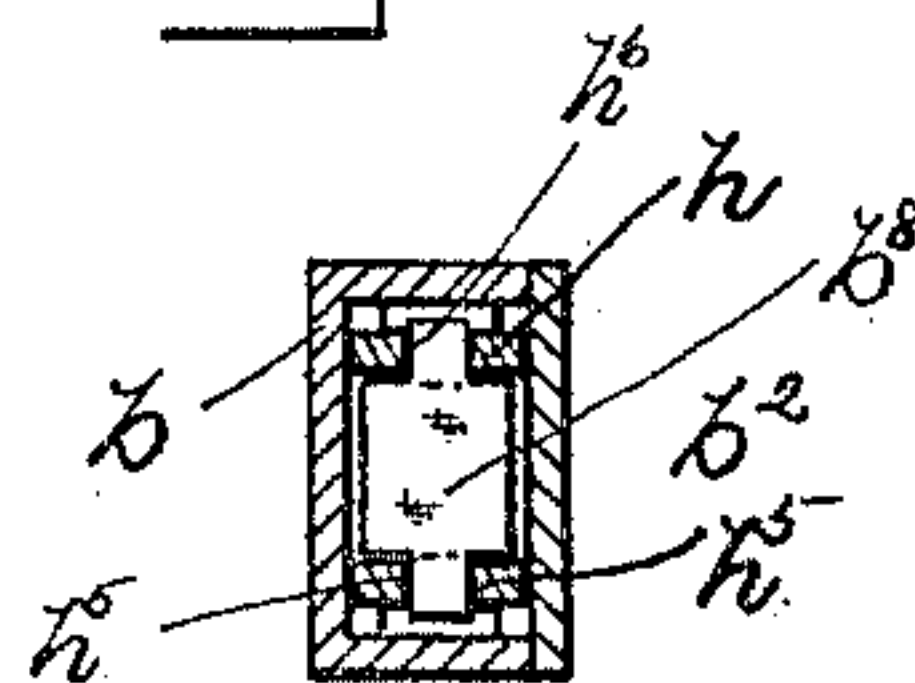
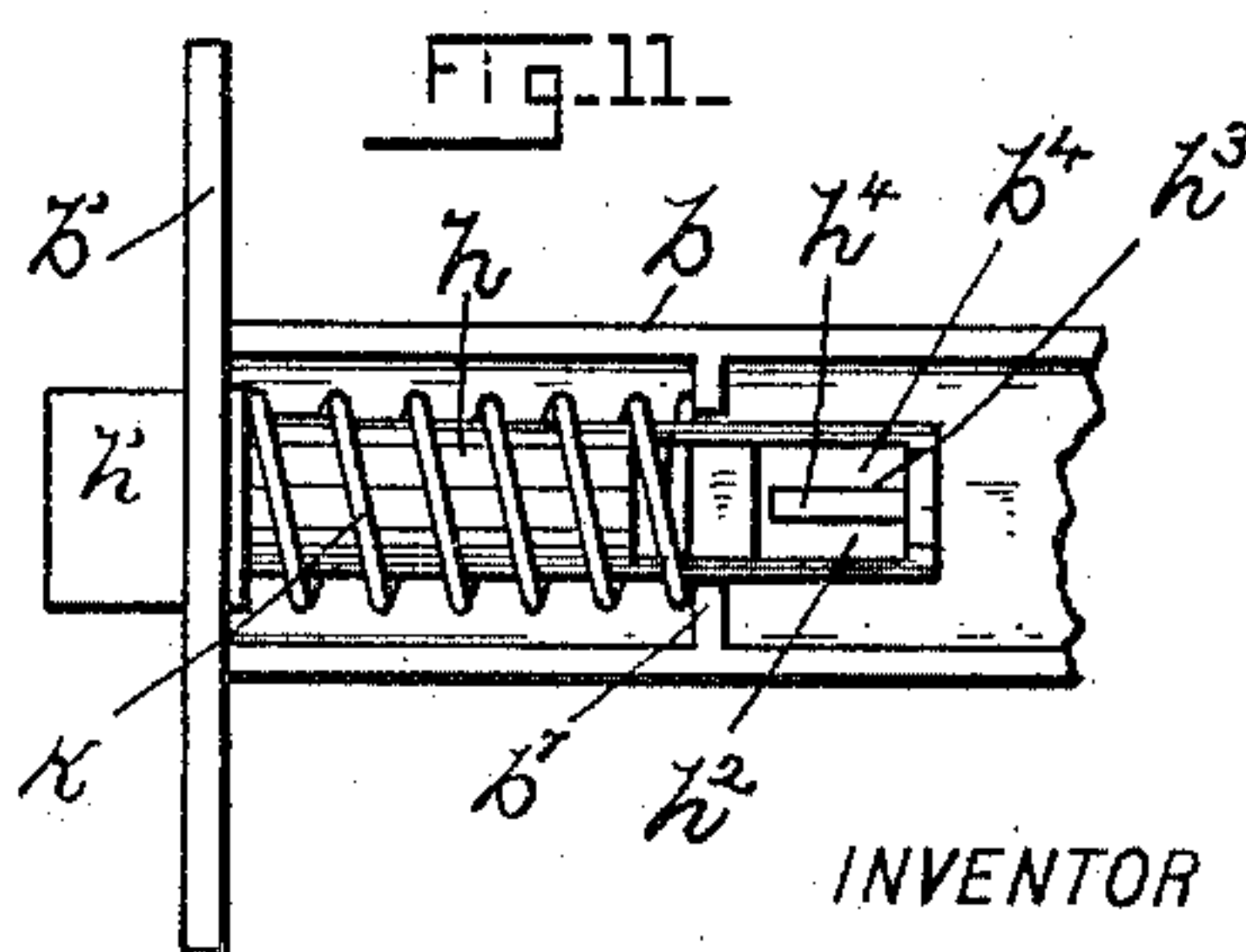


Fig. 11.



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KNOB-LATCH.

SPECIFICATION forming part of Letters Patent No. 659,887, dated October 16, 1900.

Application filed June 15, 1900. Serial No. 20,470. (No model.)

To all whom it may concern:

Be it known that I, WALTER A. CROUCH, a citizen of the United States, residing at Center Groton, New London county, Connecticut, have invented certain new and useful Improvements in Knob-Latches, of which the following is a full, clear, and exact description.

This invention is in knob-latches, and has for its object the production of a latch of simple construction which shall be operated by moving the knobs and their connecting-spindle with a longitudinal rather than with the ordinary rotary movement and in which the same impulse exerted to operate the latch or a continuation thereof shall serve also to swing the door upon its hinges.

My improvements also make possible a novel manner of mounting the knobs upon the latch-spindle, as hereinafter fully described.

To aid in explaining my invention, I have provided the accompanying sheet of drawings, illustrating the same as follows:

Figure 1 is an edge view of a portion of a door fitted up with my newly-invented latch. Fig. 2 is a cross-sectional view taken in the main on the line 1 1 of Fig. 1. Fig. 3 is a view of the latch-case with its cover-plate removed to expose certain of the interior mechanism. Fig. 4 embraces perspective views of the said case and of the bolt forming a portion of the latch mechanism. Fig. 5 shows in side elevation a portion of the spindle. Fig. 6 illustrates, principally in section, the manner of mounting the knobs upon the spindle of my newly-invented latch without the use of screws. Fig. 7 is a sectional view taken on the line 7 7 of Fig. 6. Fig. 8 shows in perspective a slightly-modified form of bolt. Fig. 9 is a view similar to Fig. 3 and shows, partly in elevation and partly in section, the manner of assembling the bolt of Fig. 8 and connected parts in the lock-case. Fig. 10 is a cross-sectional view taken on the line 10 10 of Fig. 9. Fig. 11 illustrates a still further modified form of bolt.

Referring to the drawings, the letter *a* denotes the portion of a door adjacent the latch, and *b* denotes the latch-case, which latter is set into the door *a* in the usual manner. The case *b* is provided at its forward end with the

face-plate *b'*, and one of its sides is removable when the case is withdrawn from its seat in the door to enable the interior of said case to be reached, and such removable side I have termed the "cover-plate" and denoted the same by the reference-letter *b²*.

The letters *c* and *d* denote the usual escutcheon-plates, located, respectively, on the opposite sides of the door and provided with hubs *c'* *d'*, that are chambered, respectively, as at *c²* *d²*, to receive the shanks of the knobs *e* and *f*, which said shanks are capable of limited longitudinal movement in the chambers within which they are received.

The reference-letter *g* denotes the usual spindle, the opposite ends of which receive, respectively, the knobs *e* and *f*. In Fig. 2 the said knobs are shown as secured to the spindle by the screws *e'* *f'* in the usual manner; but in Fig. 6 the said knobs are secured in a manner hereinafter explained.

The spindle *g* passes through the door *a* and case *b* and its opposite ends enter the chambers *c²* *d²* to receive the knobs *e* and *f*. To permit the spindle *g* to be passed through the door *a* and case *b*, as just mentioned, the door is bored, as at *a'*, to receive the said spindle. The cover-plate *b²* and the opposite side wall of the case *b* are provided with squared holes *b³* *b⁴*, located midway the length of the casing and in alinement with each other and in alinement also with holes *c³* *d³*, located, respectively, in the bottom walls of the chambers *c²* *d²*.

The bolt *h* of my newly-invented latch mechanism is located in the case *b* and is capable of limited longitudinal movement therein. The forward end of the bolt *h* is provided with the usual beveled face *h'*, which protrudes beyond the face-plate *b'* when the bolt is in its forward position. In the rear of the said beveled face *h'* of the bolt *h* a rectangular opening *h²* is provided, extending almost throughout the length of the bolt, but being inclosed by top and bottom and end walls. The spindle *g* passes through the opening *h²* adjacent its rear wall, and extending into said opening from the said rear wall is a projection *h³*, having a beveled edge *h⁴* substantially parallel with the beveled face *h'* of the said bolt *h*. The projection *h³* just mentioned enters a slot *g'* in the spindle *g*,

and the beveled edge thereof is engaged by a roll g^2 , axially supported in the slot g' by means of a pin g^3 . The roll g^2 is of such size and is so located in the spindle g that it lies
 5 entirely within the cross-sectional area of the spindle and may therefore be readily passed through a hole in the door of sufficient size to receive the spindle g instead of requiring a larger or supplemental opening, as is nec-
 10 essary in some analogous devices in which a roll is pivoted in the bolt, and a laterally-extending fin, with inclined edge, is formed on the spindle.

In Figs. 2, 3, and 4 there is shown as located
 15 on one of the side walls of the casing b (preferably the stationary wall) a projection b^5 , which enters the rectangular opening h^2 of the bolt h just in advance of the spindle g , and between the said projection b^5 and the
 20 forward end wall of the opening h^2 a spring k is confined, which seeks constantly to force the bolt h outward; but such outward movement of the bolt is limited by reason of the engagement of the end wall of the opening
 25 h^2 with the spindle g passing therethrough.

Assuming that the door of Fig. 2 is latched and it is desired to open the same, it will be understood that it must swing in the direction of the arrow, and it will therefore be
 30 necessary to push said door if approached from the side of the knob e or to pull the same if approached from the side of the knob f . Before the door can be opened, however, it is first necessary to operate the bolt h to
 35 unlatch the same, so that upon grasping either of the knobs and operating in the manner described the first result is to cause the spindle g and its knobs to move longitudinally, as shown in dotted lines in the draw-
 40 ings. When the spindle g begins to move, as just mentioned, the roll g^2 , carried thereby, begins to travel on the beveled edge h^4 of the projection h^3 , resulting in forcing the bolt h rearward against the force of the spring
 45 k . The just-mentioned movement is continued until the beveled face h' of the bolt h is withdrawn from engagement with the strike-plate a^2 , (dotted lines, Fig. 2,) which said position of the bolt is reached at approximately
 50 the completion of the longitudinal movement of the knob-shanks within the chambers $c^2 d^2$. When the bolt h has assumed the position just mentioned, continued pushing or pulling upon the knobs, as the case may be,
 55 serves to swing the door upon its hinges. When the bolt end h' is withdrawn from the strike-plate a^2 , the various elements of the latch mechanism have assumed approximately the positions shown in dotted lines in
 60 Fig. 2 of the drawings, and as soon as the door a begins to open the spring k seeks at once to force the bolt h outward, causing the projection h^3 , whose beveled edge h^4 engages the roll g^2 , to return the said roll and its spin-
 65 dle g and knobs e and f to their normal positions. Upon closing the door the bolt h engages the strike-plate a^2 and is first forced

backward against the force of the spring k until the said bolt enters the opening in the strike-plate and the various elements assume 70 their normal positions.

I have described the knobs e and f as mounted upon and secured to the spindle g in the usual manner; but so as to operate with a sliding spindle, as described, and I 75 have also provided means whereby the said knobs may be more positively secured in position, while at the same time the screws e' f' may be dispensed with and the common annoyance of having such screws work loose 80 is avoided.

To accomplish the result just mentioned, the shanks of the knobs e and f and the chambers $c^2 d^2$, which receive said shanks, are preferably square, as shown in Fig. 7, so that the 85 shanks, while free to move longitudinally in their respective chambers $c^2 d^2$, can not revolve therein. The spindle g , instead of being square in cross-section throughout its entire length, has its ends turned and threaded, 90 as at $g^4 g^5$, and correspondingly-tapped holes are provided in the knob-shanks to receive the said threaded spindle ends.

Assuming that it is desired to secure the knobs to the spindle after the latter has been 95 passed through the lock, the operation is as follows: The escutcheon-plates $c d$ are first mounted upon the spindle ends, with the latter projecting into and through the chambers $c^2 d^2$ in the hubs $c' d'$. The shanks of the 100 knobs $e f$ are then introduced into their respective chambers $c^2 d^2$ and the threaded spindle ends $g^4 g^5$ adjacent each knob-shank are introduced into the tapped holes of said shanks. It will now be seen that by rotat- 105 ing an escutcheon-plate— c , for example—the knob e , whose shank is received in the chamber c^2 of escutcheon-hub c' , will be correspondingly rotated, and assuming such rotation to be in the proper direction the said 110 shank will travel inward upon the threaded spindle end, which latter enters the tapped hole in the said shank. The escutcheon c is thus rotated until the knob has been screwed to the desired position on the spindle end, 115 after which the escutcheon is secured in position on the side of the door. The knobs e and f when secured to the spindle in the manner just described cannot be displaced without rotating the escutcheon-plates $c d$, which 120 latter are firmly secured in place by the screws c^4 .

In connection with my newly-invented latch mechanism any suitable mechanism 125 may be provided for locking the bolt h in its outer position. In the drawings this is shown as accomplished by means of an angle-lever m , hung upon a pin m' , projecting into the casing b and having a number of tumblers n 130 pivotally secured to the end of its upwardly-extending arm, which said tumblers are adapted to be actuated by means of a key inserted in the keyhole b^6 to rock the lever m to bring the end of its lower arm into the

path of the bolt h , and thus prevent its rearward travel, (dotted lines, Fig. 3.) When, however, the angle-lever m is in the position shown in full lines in Fig. 3, the said lower arm upon the rearward movement of bolt h enters a slot h^5 , provided in the lower rear end portion of the said bolt in order that the arm may not interfere with the rearward movement of the bolt.

10 In Figs. 8, 9, and 10 I have shown a bolt of such construction that it may be inserted in the lock-case to operate either with a right or left hand door without the necessity of opening said case to rearrange the interior mechanism. In this modified form of bolt the wall of the rectangular opening h^2 opposite the wall having the slot h^5 therein is provided with a like slot h^6 , as is best seen in Fig. 8. When this modified form of bolt is to be used, the projection b^5 , formed on the side of the lock-case and adapted to enter the bolt-opening h^2 , is done away with and in place thereof the confronting faces of the top and bottom walls of the case are provided with projections b^7 , which enter the slots h^5 h^6 and are adapted to engage the rear face of a plate b^8 , that is located in the bolt-opening h^2 and between which and the forward end wall of the opening the spring k is confined, and, if desired, the spring end adjacent the plate b^8 may be secured to the latter. When a bolt of the kind just described is provided, it will be seen that upon the removal of the spindle g the said bolt may be inserted or removed through the opening in the face-plate b' and that its insertion may be either as shown in full or dotted lines in Fig. 6. When the bolt h enters the case b , the lugs b^7 enter the slots h^5 h^6 and engage the plate b^8 , after which continued rearward travel of the bolt serves to compress the spring k . When the spindle g is passed through the opening h^2 of the bolt h , it lies in the rear of the plate b^8 and is adapted to engage the beveled edge h^4 of the projection h^3 to operate the bolt in the manner already described.

In Fig. 11 a bolt h is shown which, like the bolt just described, may be readily adjusted to operate with either a right or left hand door. In the said bolt of Fig. 11 a shank is provided having in its end an opening h^2 to receive the spindle in the manner described; but said bolt-shank is encircled by the spring k instead of the latter being located in the bolt-chamber h^2 . The spring k is confined between the bolt-head and the projections b^7 and operates in the manner set forth in connection with the styles of bolts already described.

My newly-invented latch mechanism as a whole is of very simple construction, is readily applied, and operates in a very satisfactory manner to accomplish the end for which it is designed.

Having thus described my invention, I claim—

1. In combination, in a knob-latch, a slidable bolt having an inclined portion h^4 , a spindle movable transversely to the movement of the said bolt, and a roll pivoted in said spindle and lying within the cross-sectional outline of the bolt, in engagement with said inclined portion h^4 ; the said bolt being adapted for reversal in its seat for use with either right-hand or left-hand doors.

2. In combination, in a knob-latch, a slidable bolt with inclined portion h^4 , a knob-spindle with threaded end, as set forth, a roll pivoted in the said spindle, in engagement with the said inclined portion h^4 , an internally-threaded knob-shank that is angular in cross-section, an angularly-chambered escutcheon adapted to receive the said knob-shank, and means for securing said escutcheon in desired position, all substantially as herein specified.

Signed at Norwich, Connecticut, this 30th day of May, 1900.

WALTER A. CROUCH.

Witnesses:

FRANK H. ALLEN,
ALONZO M. LUTHER.