

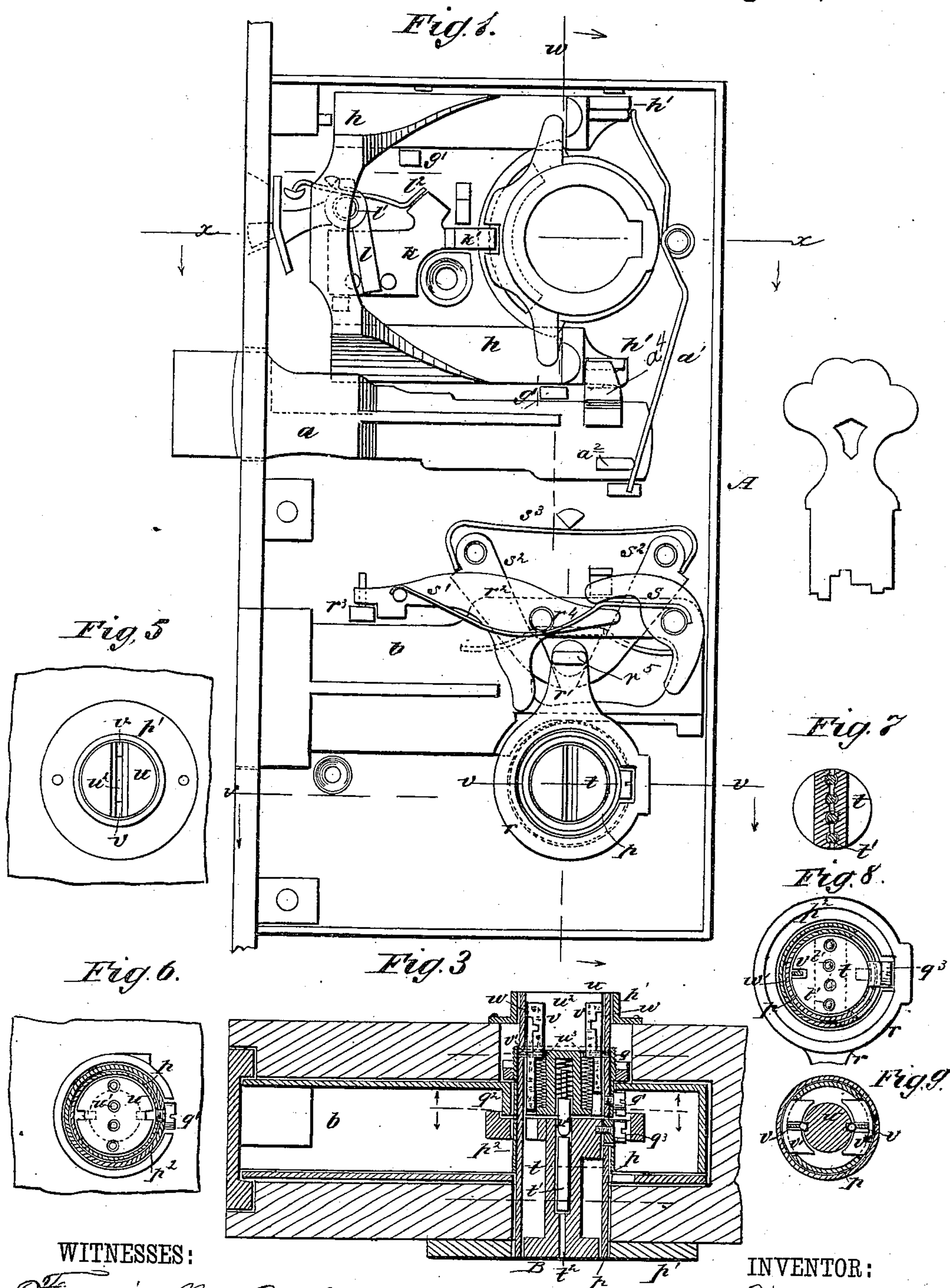
(Model.)

3 Sheets—Sheet 1.

F. KEIL.
LOCK AND LATCH.

No. 246,145.

Patented Aug. 23, 1881.



WITNESSES:

Francis M. Ardle
C. Sedgwick

INVENTOR:

BY *F. Keil*
Munn & Co
ATTORNEYS.

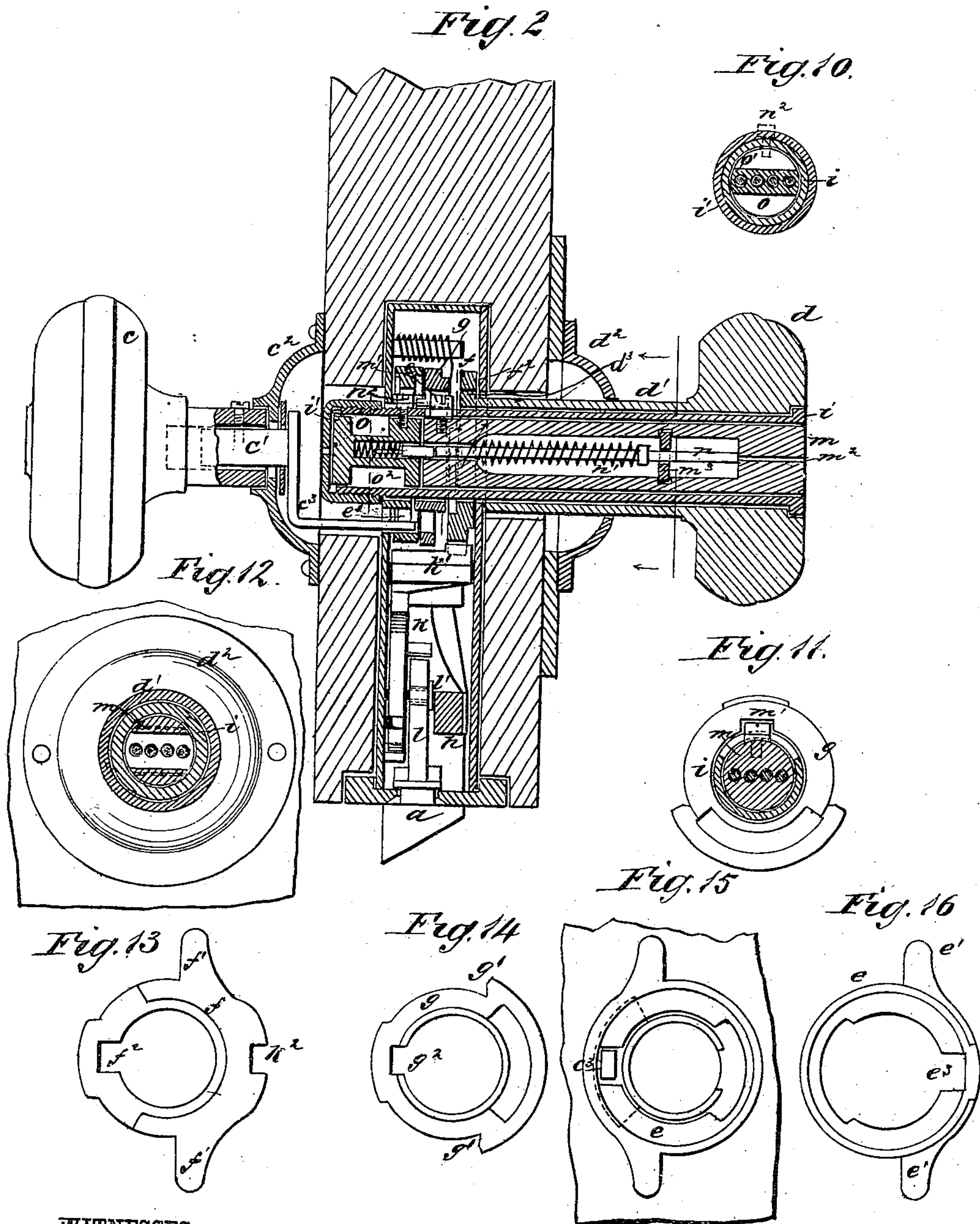
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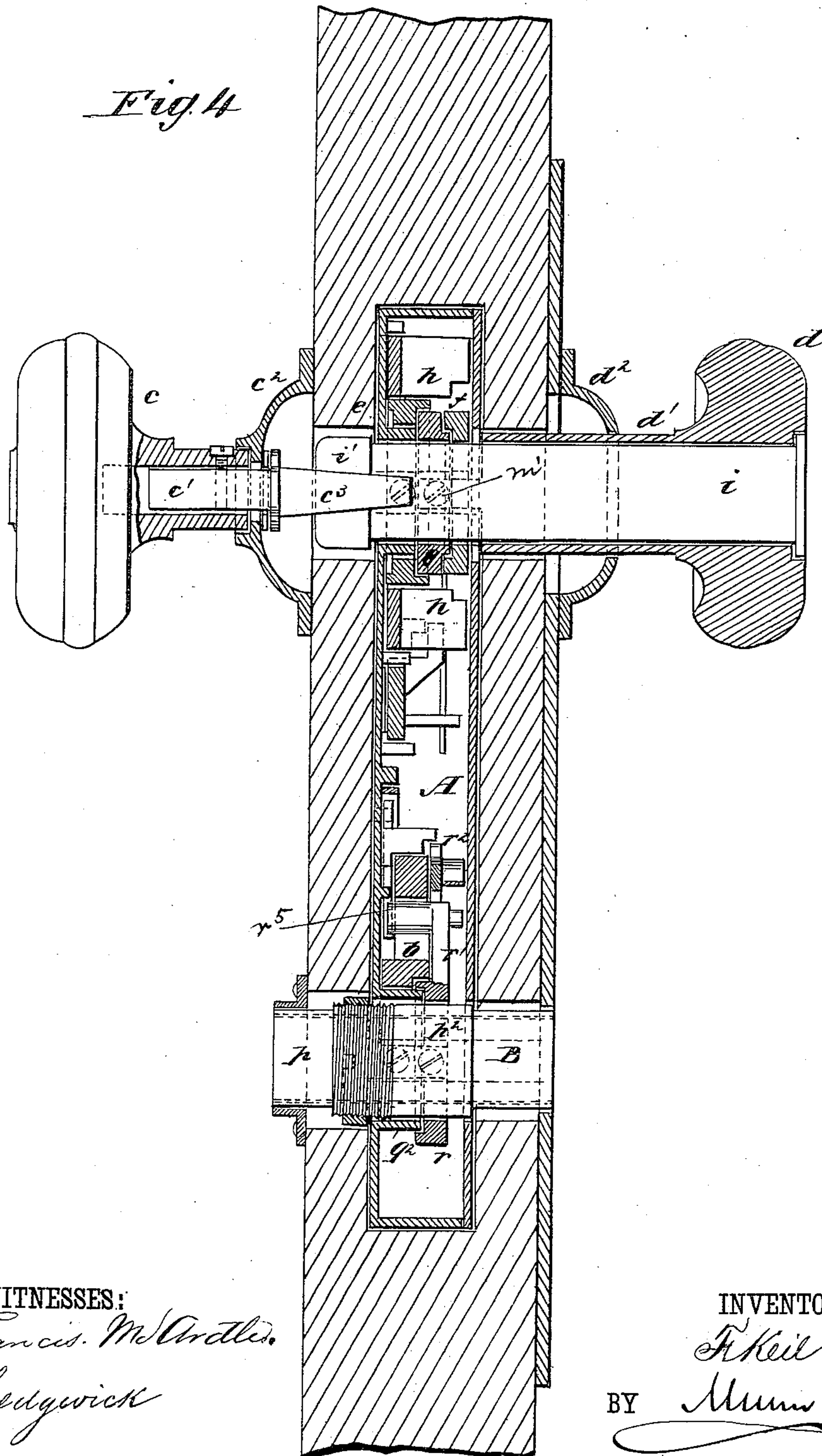
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3 Sheets—Sheet 3.

F. KEIL.
LOCK AND LATCH.

No. 246,145.

Patented Aug. 23, 1881.



WITNESSES:
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UNITED STATES PATENT OFFICE.

FRANCIS KEIL, OF NEW YORK, N. Y.

LOCK AND LATCH.

SPECIFICATION forming part of Letters Patent No. 246,145, dated August 23, 1881.

Application filed April 23, 1881. (Model.)

To all whom it may concern:

Be it known that I, FRANCIS KEIL, of the city, county, and State of New York, have invented a new and useful Improvement in Door Locks and Latches, of which the following is a specification.

My improvements relate to the class known as "front-door locks," in which the locking-bolt, latch, and night-latch mechanism are combined in a single case.

The invention consists in certain novel features of construction and combinations of mechanism for rendering the locks more convenient and reliable, as set forth in detail hereinafter with reference to the accompanying drawings.

In the drawings, Figure 1 is a face view of the lock with the cap-plate of the case removed. Fig. 2 is a cross-section on line xx of Fig. 1, and through the latch-knobs. Fig. 3 is a transverse section on line vv of Fig. 1, and through the locking mechanism. Fig. 4 is a vertical section on line ww of Fig. 1. Fig. 5 is an end view of the cylinder-lock, and Figs. 6 to 9 cross-sections of the same. Figs. 10, 11, and 12 are detail cross-sections of the night-latch mechanism. Figs. 13 to 16 show details of the latch mechanism.

Similar letters of reference indicate corresponding parts.

A is the case, similar to that of an ordinary mortise-lock, and containing latch-bolt a , projected by a spring, a' , and the locking-bolt b .

e is the inner knob of the latch, and d the outside knob, containing the night-latch mechanism.

B is a cylinder-lock fitted in case A, for operation at either side to move the bolt b .

I will first describe the latch mechanism in detail with reference to Figs. 1, 2, and 4, and the detail figures, 10 to 16.

The outer knob, d , is formed with a hollow cylindrical shank, d' , extending, as shown in Figs. 2 and 4, through the case A. Around the shank d' , and within case A, are looser rings $e f$, formed with arms $e' f'$, and engaged by the knobs for movement of the latch, as hereinafter described.

g is a middle ring, formed with shoulders or arms g' , and engaged by the cylinder of the

lock contained in knob d for withdrawal of the latch.

h is a yoke, held in place by and fitted to slide between guides g' , and engaging by one of its lugs h' a lug, a^4 , on the side of the latch-bolt a . The rings $e f g$ engage by their arms the lugs h' of the yoke, and by a partial turn of either ring in either direction the latch a is moved back.

The inner knob, e , is upon a solid spindle, e' , which passes through the rose e^2 , by which the knob is sustained, and on the inner end of the spindle is fixed a bent arm, e^3 , that projects through a curved slot in the lock-case and enters a recess, e^3 , formed in ring e . (See Fig. 16.) The ring e is upon an annular flange that is around the opening formed in the plate for the lock-cylinder, so that the ring e turns on such flange, while the rings $f g$ are directly upon the lock-cylinder.

The spindle d' passes through a rose, d^2 , to and against the face-plate of the lock, and is formed at its end with a projection, a^3 , that extends into a recess, f^2 , formed in ring f , Figs. 2 and 13, the opening in the lock-case being enlarged for the play of the projection when the knob is turned. The spindle d' contains the lock-cylinder i , which at its outer end has an annular flange taking into a rabbet formed in the face of knob d , while at the inner end of the cylinder there is a screw-cap, i' , which, being put on after the knob and cylinder are applied to the lock-case, retains the cylinder in the knob and the knob in the lock, for the reason that the cap is larger than the internal diameter of ring e , and thus prevents withdrawal of the knob and cylinder. This construction permits the parts to be readily put together, and the knob, being in one piece with its spindle, cannot be removed except access is had to the inner side of the door. This is important, as it secures valuable knobs on street-doors from being stolen.

At the front of ring f , and between the arms of yoke h , is fitted a slide, k , having a projection, k' , coinciding with a recess, k^2 , that is formed in the ring f . A bent lever, l , hung on a pivot, l' , takes by one end against a projection on slide k , while its other end projects through a slot in the front plate of the lock.

case for operation by hand to move the slide k in connection with ring f , and thus lock the outer knob, d , so that it may not be used to move the latch, or by a reverse movement of the slide free the knob. A friction-spring, l^2 , bearing on slide k , retains it in either position.

The lock contained in knob d and cylinder i is a pin-lock, of which the cylinder m fits snugly in cylinder i , and is retained therein by a screw-pin, m' , that projects through an elongated slot in the cylinder i , (see Fig. 11,) so that the inner cylinder, m , may revolve. The head of pin m' enters a recess, g^2 , in ring g , (see Figs. 2, 4, and 14,) so as to turn said ring.

From the foregoing it will be seen that the latch a is moved by the inner knob, c , acting on ring e , by the outer knob, d , acting by the ring f , and by the cylinder m of the lock in the knob d acting on ring g by means of the screw-pin m' . Further, the knob d can be locked by the slide k , and the latch can then be operated from the outside only by use of a suitable key to turn the cylinder m .

The mechanism of the lock part of the latch is as follows, reference being made to Figs. 2, 10, 11, and 12: The cylinder m is recessed in its middle portion, and from one end of the recess apertures extend through the inner end of the cylinder, while the outer end has a narrow key-slot, m^2 , for receiving a flat key. The pins n (of which there are four) extend from the key-slot to and through the inner end of the cylinder, and are held in place in the recess by a fixed guide-piece, m^3 , through which they pass. Springs n' extend around the pins, between the bottom of the recess, and collars on the pins press the pins toward the key-slot.

At the inner end of cylinder i , next the end of cylinder m , is a block, o , fixed by a screw, n^2 , Figs. 2 and 10, containing four pins, o' , in recesses, that also contain springs o^2 , that tend to project the pins. The pins coincide in position with pins n , so that they shall enter the apertures in cylinder m as allowed by the pins n , and the cylinder m is thus held against being turned except by a key of proper form, which will move back the pins n o' and free the pins o' from the cylinder m .

The mechanism in connection with the locking-bolt b is next described with reference to Figs. 1, 3, 5, 6, 7, 8, and 9.

The plates of the lock-case have circular apertures, through which passes a hollow cylinder, p , that extends also through the door at each side of the lock-case, and there are rings p' secured to the door-faces around the ends of the cylinder. On the portion within the lock-case the cylinder p is enlarged by a sleeve, p^2 , that is fitted at one end with a screw ring or collar, q , taking against the outside of the case-plate, so that the cylinder p , after being inserted from the outside of the door and the ring q put on, is held securely, and cannot be loosened by careless or malicious handling. The ring q has notches, so that it may be turned

by a forked key inserted in the space opened by removal of ring p' , so that the parts can be readily put in place without special skill. A screw, q' , projecting from the cylinder p , takes against the inside of the lock-plate in opposition to ring q and enters a notch in an annular flange, q^2 , formed around the aperture in the lock-plate, so as to prevent the cylinder from turning, and, with the ring q , accomplish the security just named.

On the flange q^2 , and around the cylinder p , is a ring, r , having a recess that is engaged by the head of a screw, q^3 , which projects from the lock-cylinder hereinafter described. Ring r is formed with an arm, r' , that extends into a slot formed in bolt b . On a stud, r^5 , on the bolt b is pivoted a tumbler, r^2 , that engages by its end a fixed stud, r^3 . The inner end of this tumbler is forked, one end passing in front of the arm r' of ring r , and the other end passing above the arm and beneath the end of a second tumbler, s , that is pivoted on the bolt. One end of tumbler s projects behind the arm r' , while the other end takes over the tumbler r^2 , as mentioned. A spring, s' , retains the contact of tumbler r^2 with stud r^3 .

Two dogs, s^2 s^2 , are hung by one end to studs fixed above the bolt, so that the ends of the dogs may project behind the slot in the bolt and rest at opposite sides of a lug projecting from arm r' of the ring.

A flat spring, s^3 , taking upon the upper ends of arms r^2 , retains their moving ends upon the arm r' and serves to return ring r to its middle position in the slot. When the ring is moved in one direction it first acts on the forked end of tumbler r^2 and the spring-dog, and raises the tumbler free from stud r^3 , and then projects the bolt by pressure on the end of the slot in the bolt. At the same time the ring moves one of the dogs s^2 , the spring of which returns the ring to the middle position as soon as released. The reverse movement of the ring first acts on dog s^2 , and then on tumbler s , and the latter, in turn, acts on tumbler r^2 , and the ring then retracts the bolt.

It will be noticed that the ring, and consequently the turning cylinder of the lock contained in cylinder p , is returned to the normal position after each movement of the bolt, and therefore the key-slot is always retained in one position, preferably vertical. This is convenient, and avoids the bad appearance of a key-slot at an angle.

The cylinder p contains a turning cylinder or block, t , held by a screw q^3 , that engages with ring r . In the cylinder t are pins t' , and the cylinder p contains also a block, u , fitted with spring-pins u' , projecting in contact with the pins t' . The outer end of cylinder t has a key-slot, t^2 , and the operation is the same as described in connection with the latch-lock. In addition, I provide for turning cylinder t and moving bolt b from the inside of the door, as follows: The end of block u extends flush with the end of cylinder p , and is formed with

a key-slot, u^2 . From the base of the slot, and at opposite sides, the block is formed with longitudinal grooves that contain spiral springs u^3 .

In the key-slot u^2 there are flat pins v , that project into the side grooves of the block and take by shoulders upon the springs u^3 , so that the springs tend to move the pins outward. The block u is also formed with an annular groove at the base of the key-slot, in which are plates v' , of segmental form, resting on the pins v , and notched for engagement therewith. These plates v' are of a width to project into slots formed in cylinder p , and thus hold the block u from being turned, and consequently hold the cylinder t so that the latter cannot be turned except when a key is used to move back the pins $t' u'$. The pins v are held normally by the notched plates v' , and are formed with recesses w , which give clearance when such recesses coincide with the notches in plates v' . This position is obtained by insertion of the key, and the recesses should be placed so that the same key serves for both inside and outside use. The block u being turned carries the cylinder t with it, and the bolt b is thus operated.

The combined latch and lock above described meets all the conditions required in a street-door lock. It is of durable construction, not liable to get out of order, and furnishes the security of a tumbler-lock in connection with the latch as well as the bolt.

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

1. The combination of latch a , yoke h , knob c , and spindle provided with arm e' , ring e , formed with arms e' , knob d , spindle d' , with its projection, and ring f , having arms f' , substantially as shown and described, for operation as specified.

2. The slide k , bent lever l , recessed ring f , knob d , spindle d' , and cylinder i , containing

lock mechanism for operating the latch, substantially as shown and described, combined for operation as specified.

3. The knob d and hollow spindle d' , formed integral, the lock-cylinder i , and screw-cap i' , combined with the lock-case A, substantially as shown and described.

4. The ring g , formed with shoulders g' , lock-cylinder i , and turning cylinder m , provided with screw m' , combined with the hollow knob-spindle d' , with its projection, ring f , latch a , and yoke h , substantially as shown and described, for operation of the latch, as set forth.

5. The slotted cylinder m , the screw-pin m' , spring-pins n , block o , spring-pin o' , and containing-cylinder i , combined with the hollow spindle d' , and knob and latch operating ring g , substantially as shown and described.

6. The bolt b , tumblers $r^2 s$, spring-dogs s^2 and ring r , arm r' , with lug extending therefrom, and cylinder p , containing mechanism for moving ring r , substantially as shown and described, combined for operation as set forth.

7. The spring-dogs s^2 , combined with the ring r , arm r' , and lug-bolt b , and cylinder-lock B, with pin q^3 , substantially as and for the purpose set forth.

8. The cylinder p of the locking mechanism, screw-sleeve p^2 , ring q , and pin q' , combined with the lock-case, formed with recessed flange q^2 , substantially as shown and described.

9. The recessed flat spring-pins v and segmental plates v' , resting on the pins and notched for engagement therewith, combined with the grooved block u , the slotted cylinder p , and the pin q^3 , for operating the ring $r r'$ of lock B, substantially as and for the purposes set forth.

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Witnesses:

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C. SEDGWICK.