

J. HOPE, JR.
LOCK AND LATCH.

APPLICATION FILED NOV. 21, 1905. RENEWED MAY 14, 1908.

907,499.

Patented Dec. 22, 1908.

5 SHEETS—SHEET 1.

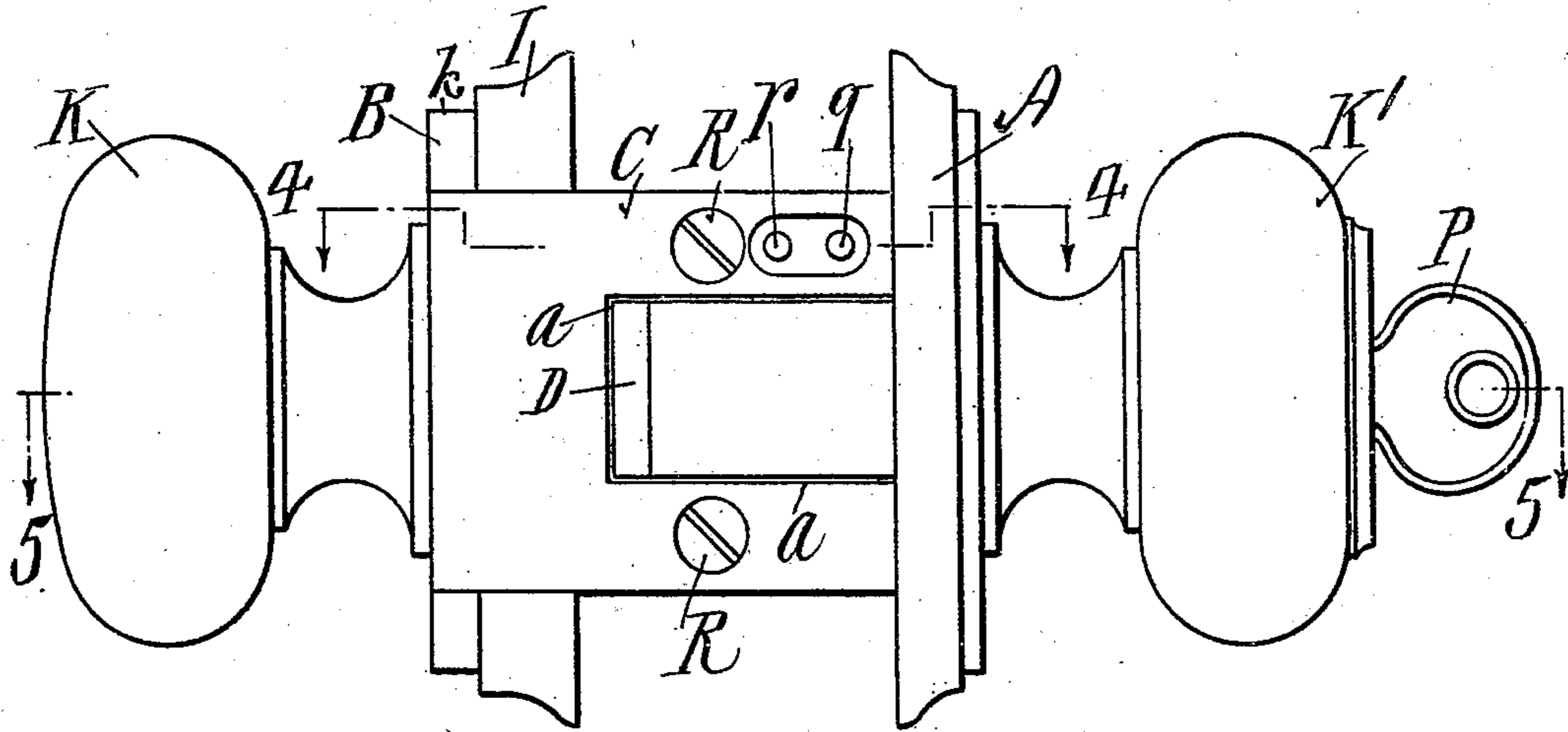


FIG. 1.

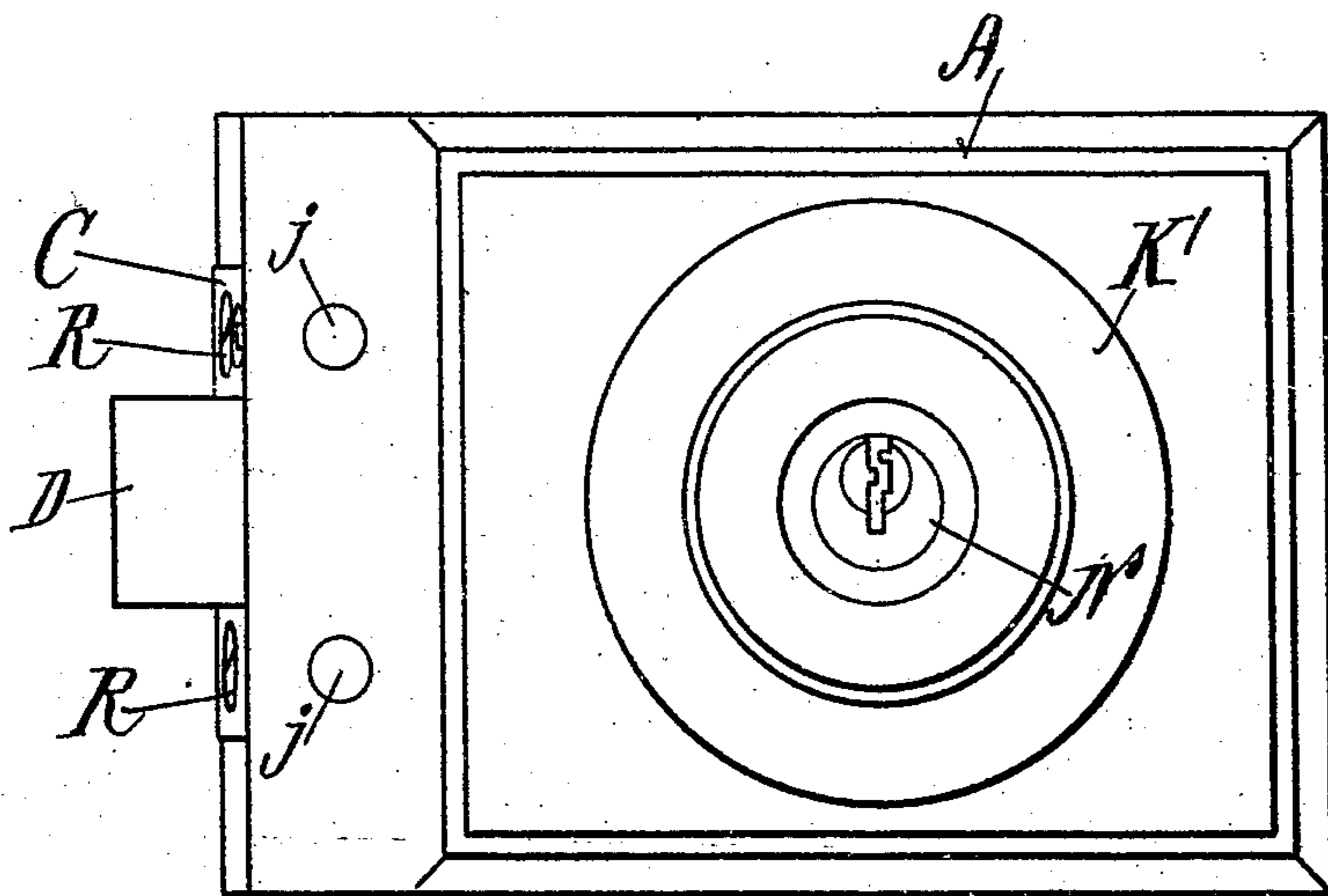


FIG. 2.

WITNESSES.

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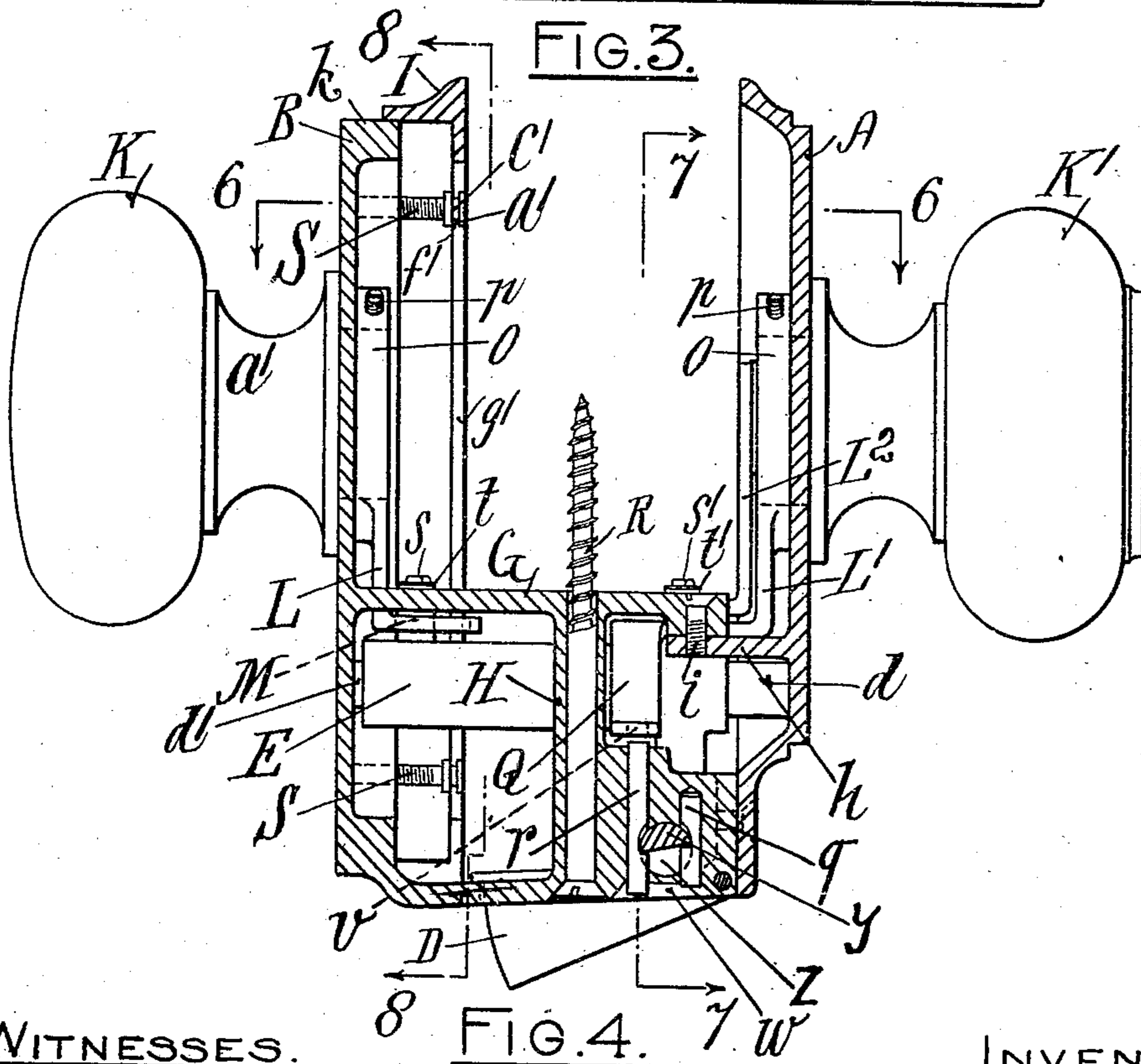
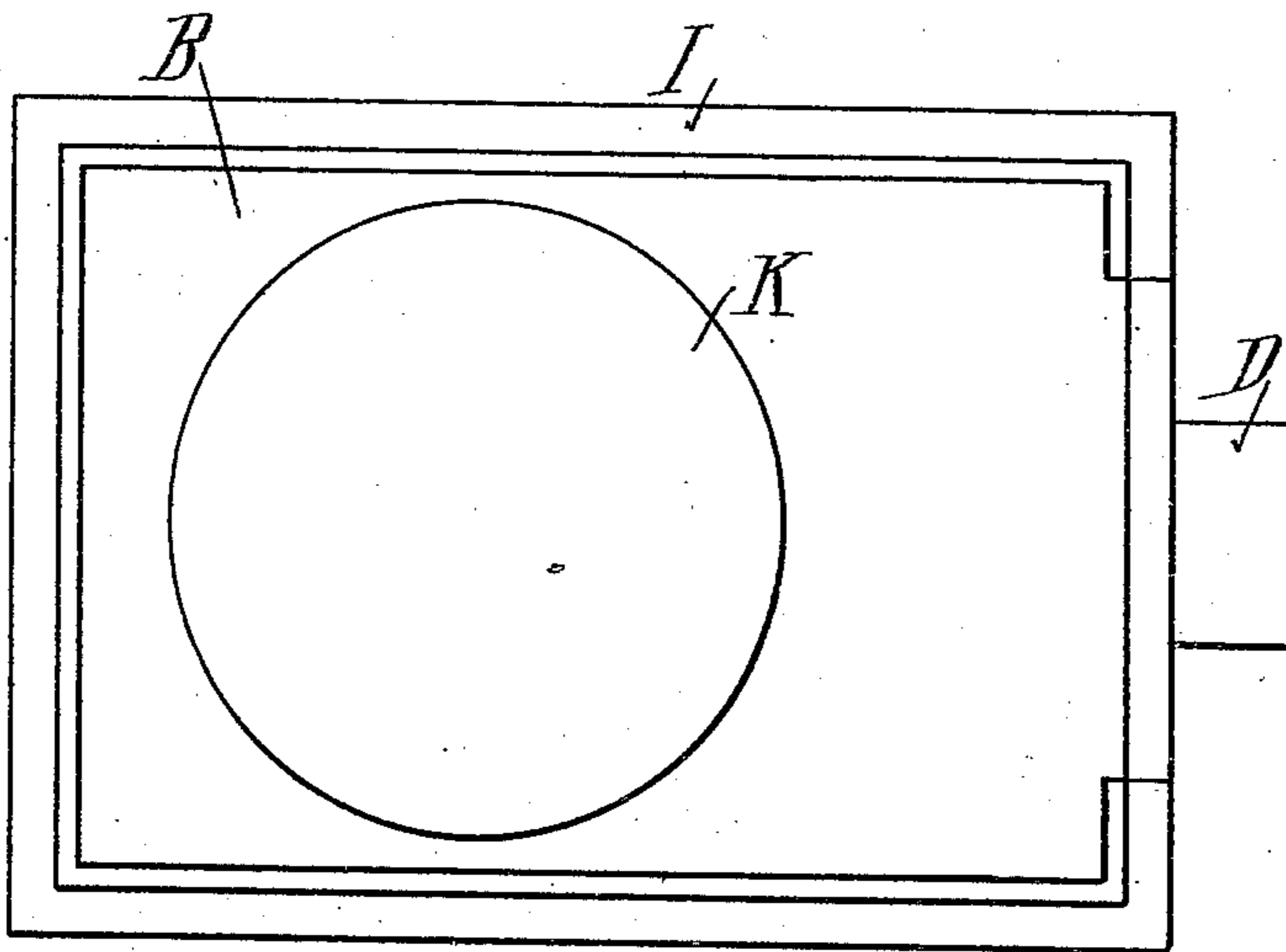
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5 SHEETS—SHEET 3.

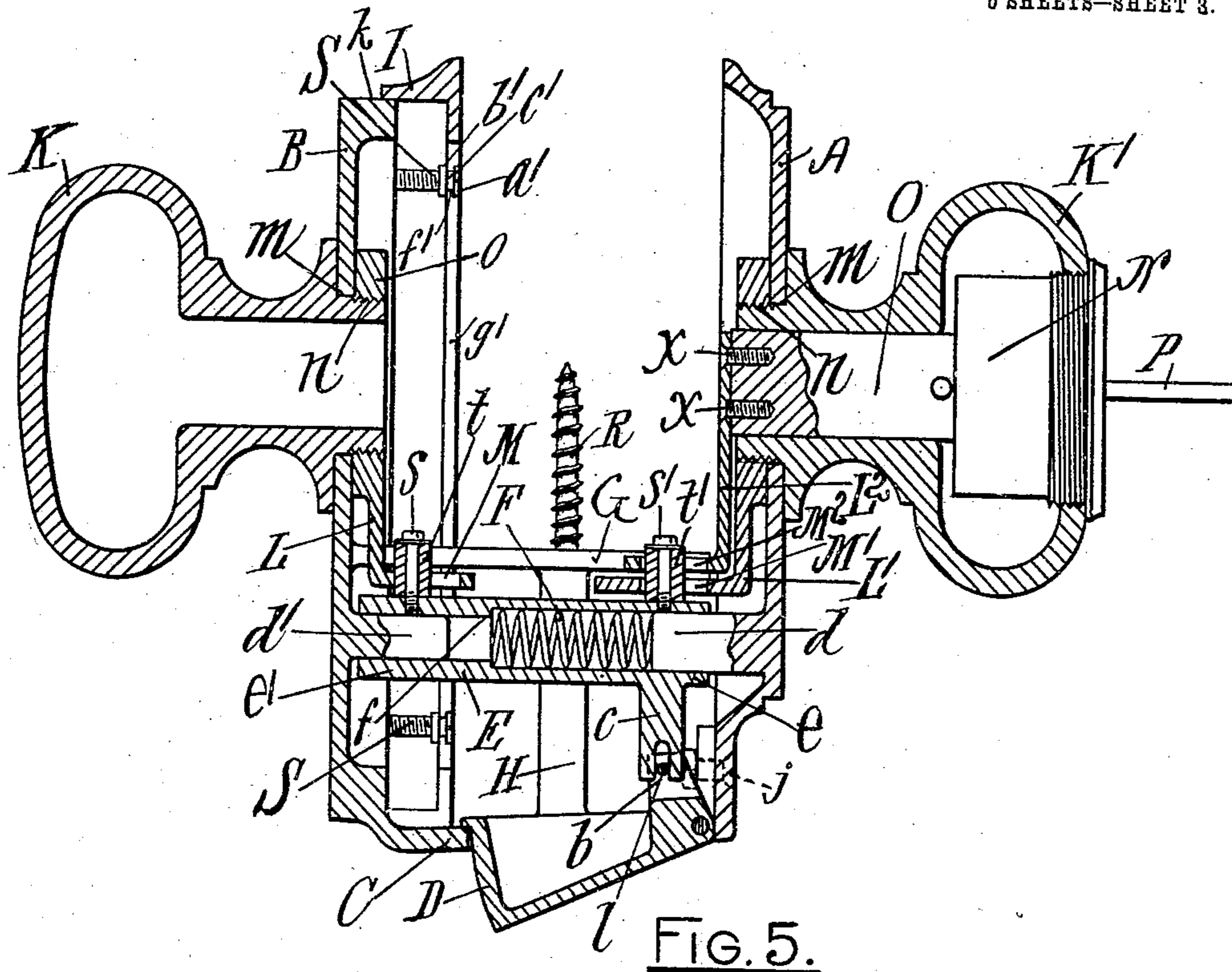


FIG. 5.

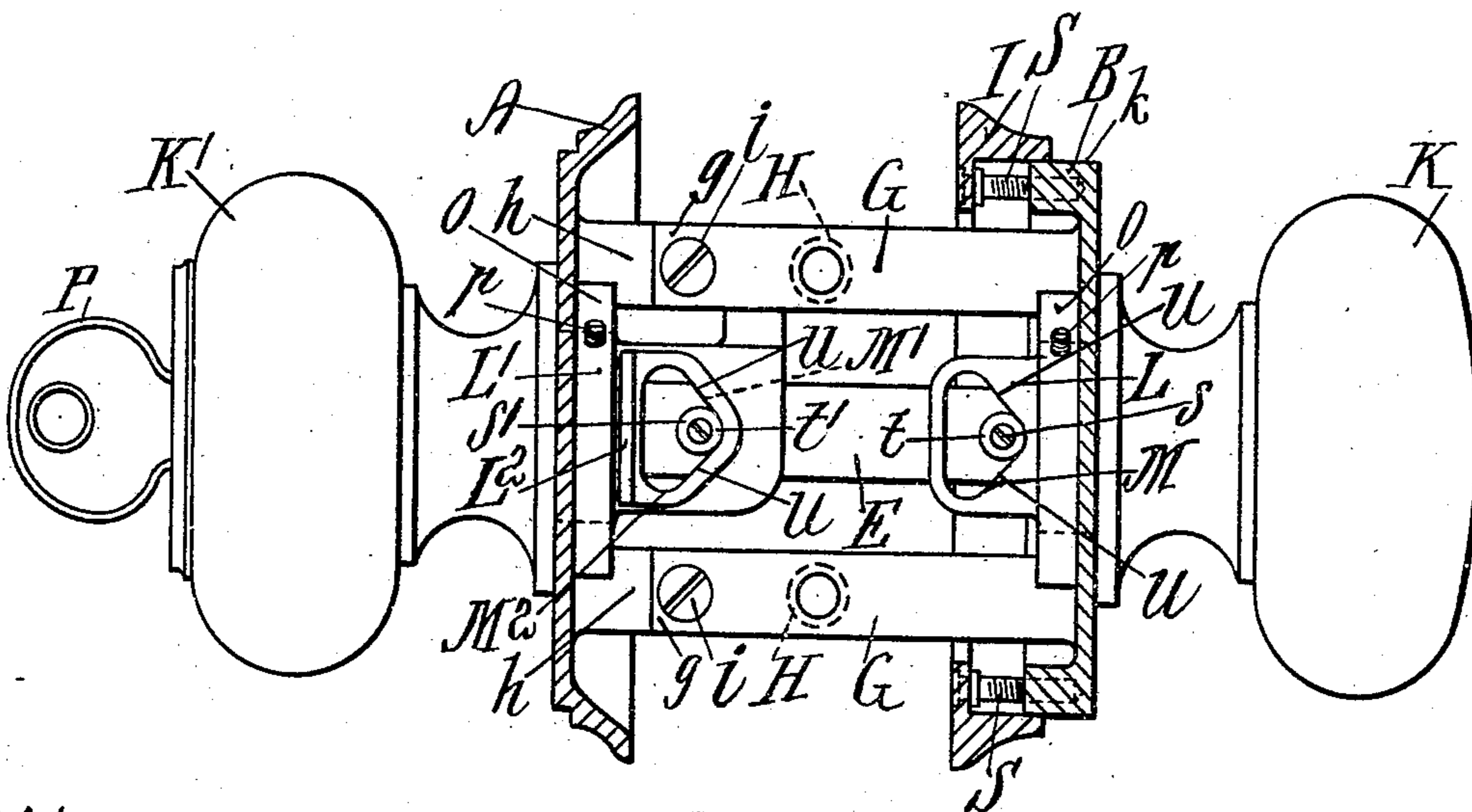


FIG. 6.

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5 SHEETS—SHEET 4.

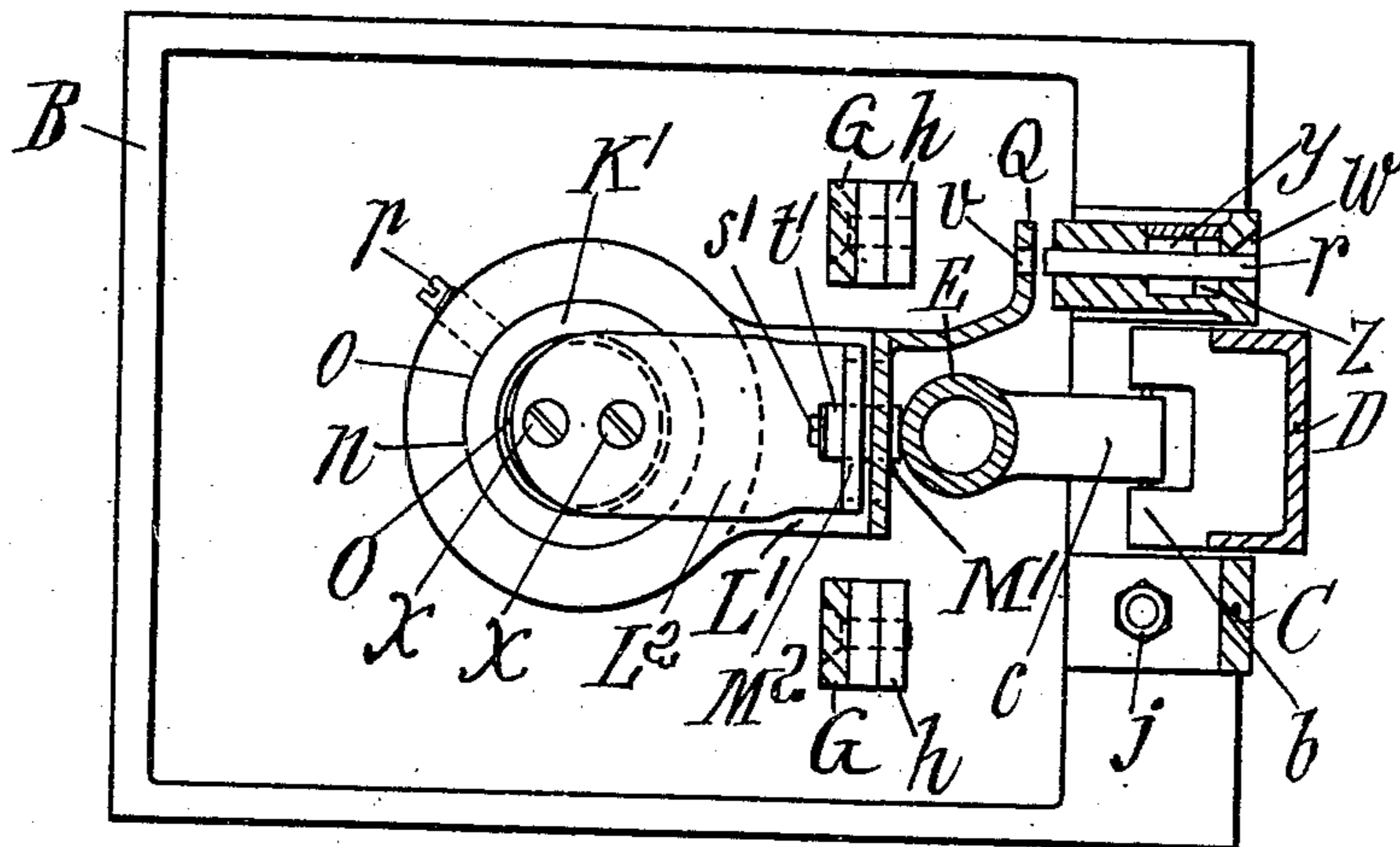


FIG. 7.

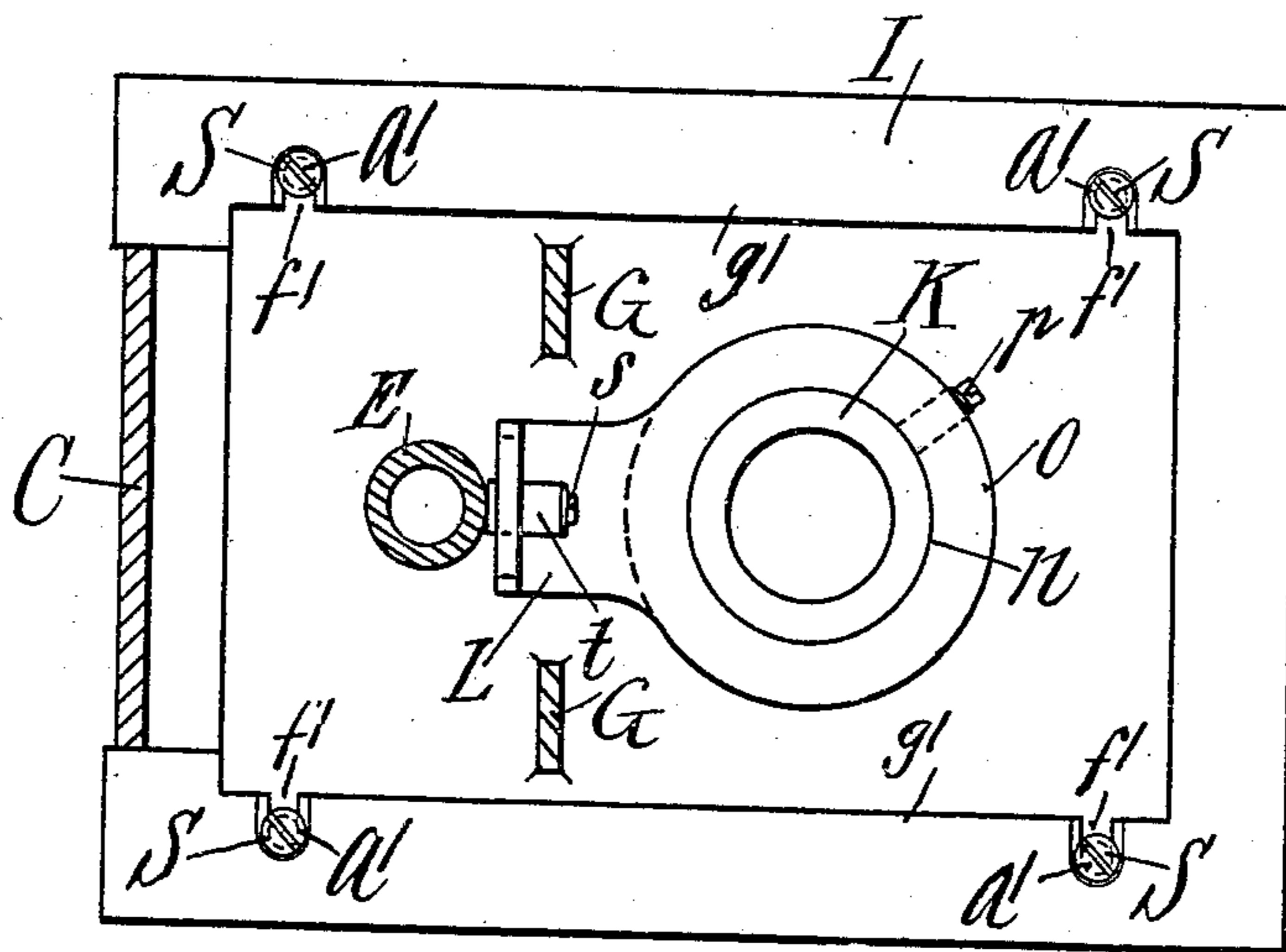


FIG. 8.

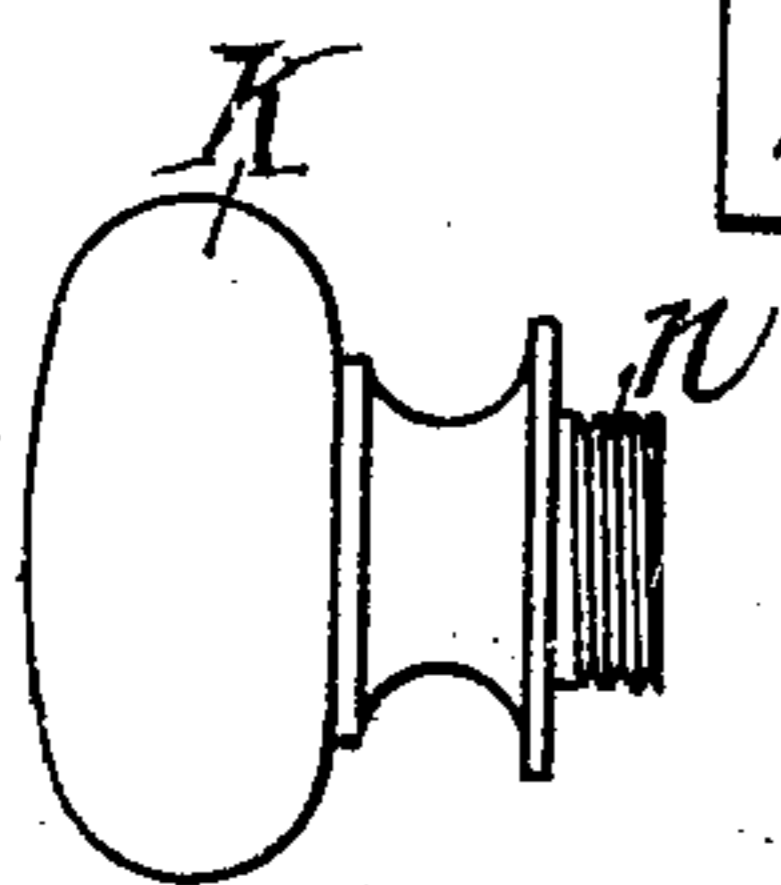


FIG. 10.

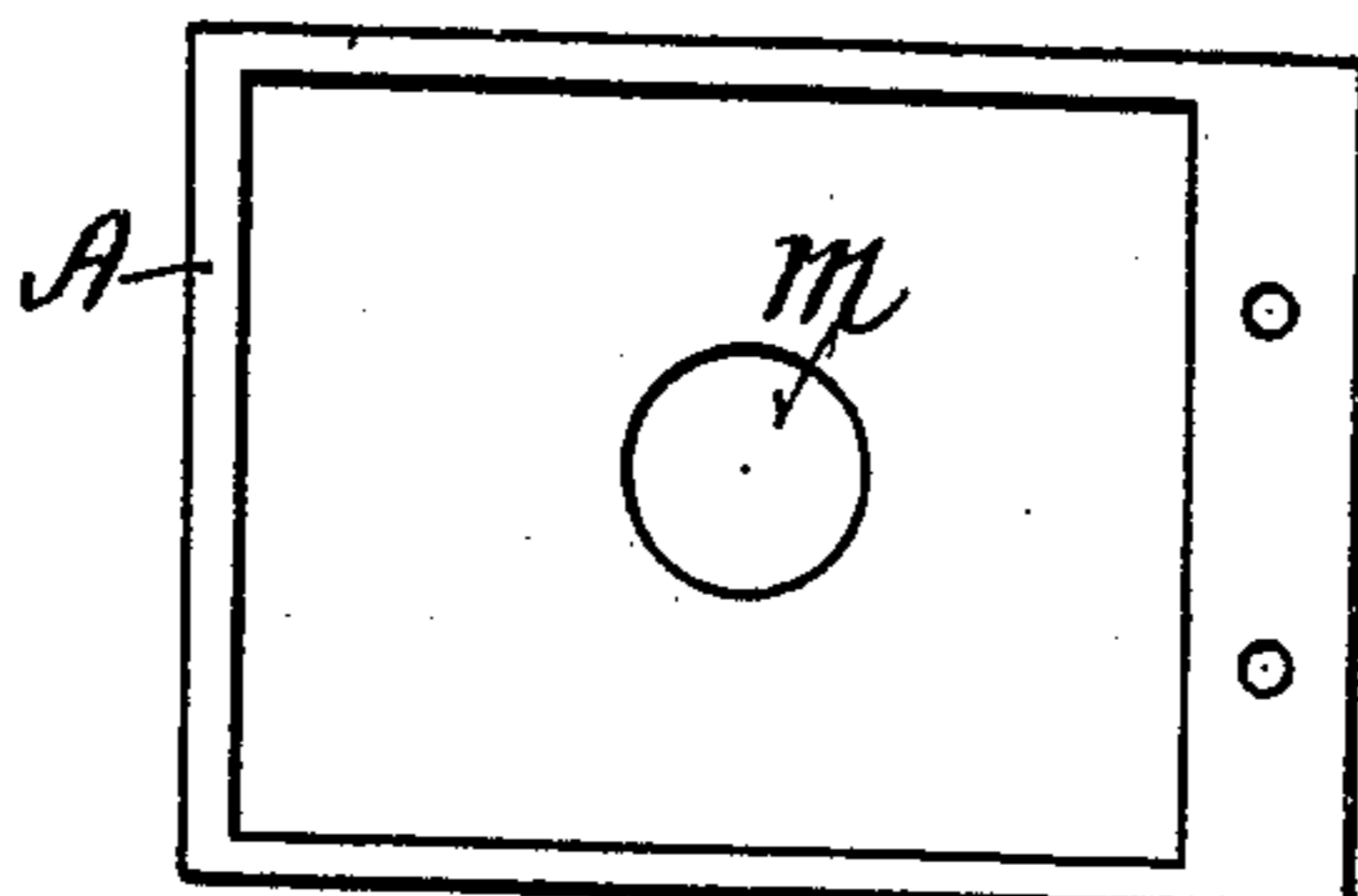


FIG. 9.

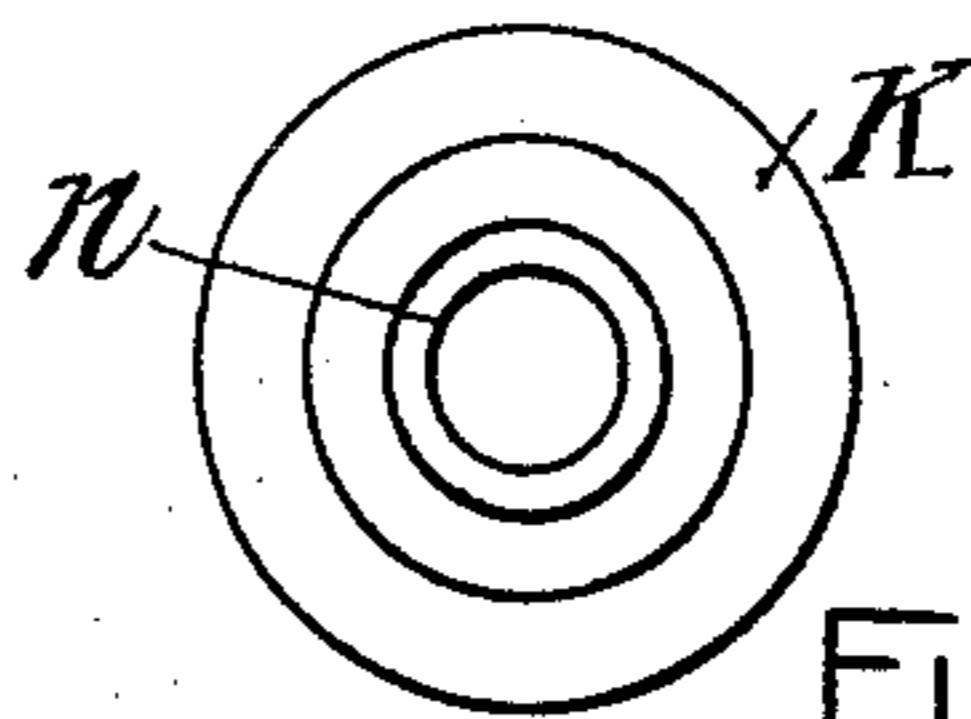


FIG. 11.

WITNESSES.

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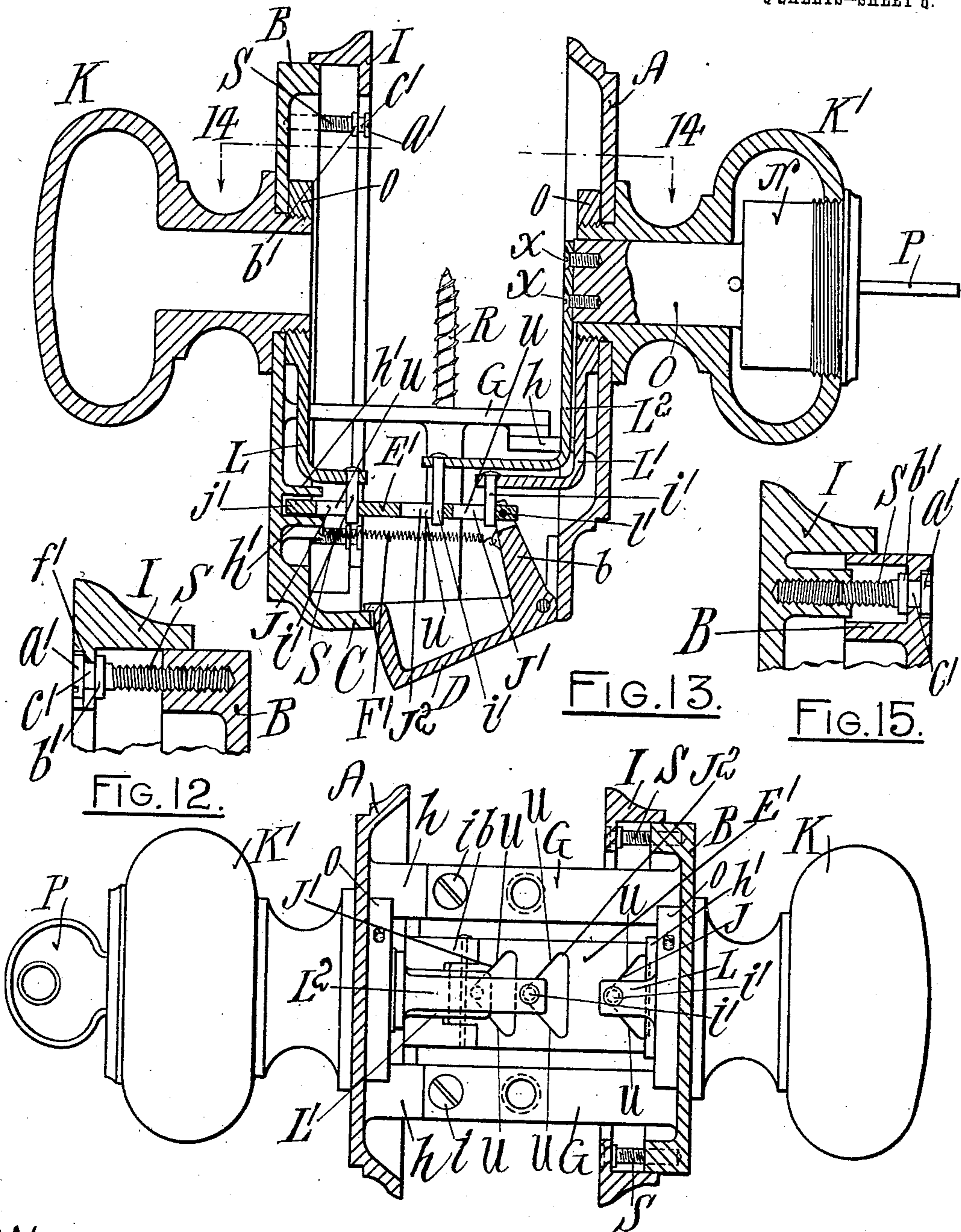
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6 SHEETS—SHEET 5.



WITNESSES.

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FIG. 14.

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UNITED STATES PATENT OFFICE.

JOHN HOPE, JR., OF EDGEWOOD, RHODE ISLAND, ASSIGNOR TO HOPE LOCK COMPANY, OF PROVIDENCE, RHODE ISLAND, A CORPORATION OF RHODE ISLAND.

LOCK AND LATCH.

No. 907,499.

Specification of Letters Patent.

Patented Dec. 22, 1908.

Application filed November 21, 1905, Serial No. 288,468. Renewed May 14, 1908. Serial No. 432,901.

To all whom it may concern:

Be it known that I, JOHN HOPE, Jr., a citizen of the United States, residing at Edgewood, in the county of Providence, in the State of Rhode Island, have invented a new and useful Improvement in Locks and Latches, of which the following is a specification.

The object of my invention is to provide an improved lock or latch, the frame of which is rigid in its construction, and provided with inner and outer side plates and a front plate extending across the edge of the door, and with means whereby the rigid frame is made adapted for attachment to doors of different thicknesses; and in which, the turning movement of the knob in either direction from its normal intermediate position will cause the withdrawal of the latch bolt for opening the door. And my invention consists in the improved construction of the frame of the lock, or latch; in the combination of the rigid frame with a rim-plate provided with adjusting screws, whereby the frame is made applicable to doors of different thicknesses; in improved means for operating the latch bolt from the rotation of either one of the knobs; and in the improved construction of the stop-catch for preventing the rotary movement of the outer knob for unlatching the door.

In the accompanying drawings, Figure 1, represents a forward end view of a lock embodying my improvement. Fig. 2 represents an outer side view of the lock. Fig. 3 represents an inner side view of the same. Fig. 4 represents a horizontal section taken on the line 4 4 of Fig. 1. Fig. 5 represents a section taken on the line 5 5 of Fig. 1. Fig. 6 represents a section taken on the line 6 6 of Fig. 4. Fig. 7 represents a section taken on the line 7 7 of Fig. 4. Fig. 8 represents a section taken on the line 8 8 of Fig. 4. Fig. 9 represents an inner side view of the outer frame plate of the lock upon a diminished scale. Fig. 10 represents a side view of one of the knobs of the lock. Fig. 11 represents an inner end view of the same. Fig. 12 represents an enlarged detail section, showing one of the adjusting screws for the rim-plate. Fig. 13 represents a section as in Fig. 5, showing a modification. Fig. 14 represents a section taken on the line 14 14 of Fig. 13. Fig. 15, represents an enlarged detail section,

showing a change in the position of the adjusting screws for the rim-plate.

In the drawings, A represents the outer frame plate of the lock or latch; B the inner plate, and C the front plate, which latter extends across the edge of the door and is provided with the elongated opening *a*, adapted to receive the pivoted latch bolt D. The latch bolt D is provided with the backwardly extending arm *b*, and the pivot-pin *l*, by means of which operative engagement is made with the forwardly projecting notched arm *c* of the intermediate member E, the said intermediate member being arranged for transverse horizontal movement in the plane of the pivotal movement of the latch bolt D. The said intermediate member E, is made in hollow cylindrical form and loosely held upon the studs *d d'*, which are formed integral with the outer and inner plates A and B. The stud *d*, is made of greater diameter than the stud *d'*, and the end portion *e*, of the intermediate member E, is bored out to a diameter greater than the diameter of the opposite end portion *e'*, thus forming an interior shoulder *f*, against which the inclosed spiral spring F, will be caused to act, the said spiral spring bearing at its opposite end against the inner end of the stud *d*, of the outer plate; whereby the action of the said spring upon the intermediate member E, will serve to carry the pivoted latch bolt D, automatically to its outward engaging position, as shown in Fig. 5. The tie-arms G G, are cast integral with the inner plate B, and the hollow arms H H, are cast integral with the said tie-arms, and with the front plate C. The outer ends *g g* of the said tie-arms G G, are secured to the inwardly projecting ears *h h*, of the outer plate A of the frame, by means of the screws *i i*, and the said outer plate is secured to the front plate C by means of bolts or rivets *j j*, whereby the said frame will be made rigid in its construction. The inner frame plate B is provided with the adjustable rim-plate I, which incloses the edge *k*, of the said frame plate B. The rim-plate I, is made adjustable, so as to adapt the lock or latch frame to doors of different thicknesses, by means of the adjusting screws S S, which are threaded into the inner side of the said frame plate B; the said screws being provided with a head *a'*, a collar *b'*, and an intermediate neck *c'*, and the said neck is held in the notch *f'* made

in the inner edge g^1 of the said rim-plate; and by turning the said adjusting screws which are accessible only from the inner side of the frame plate B, the space between the inner face of the outer frame plate A, and inner face of the rim-plate I, may be adjusted by means of the screws S S, to fit closely against the side of the stile of the door, and thus to fit doors of various thicknesses. The space between the inner faces of the outer and inner plates of the rigid lock or latch frame is to be made greater than the thickness of the door to which the frame is to be applied, in order to provide suitable space for adjustment by means of the screw-actuated rim-plate.

The outer and inner plates A and B are each provided with a circular opening m , which is adapted to receive the inner ends of the knobs K K¹, the said inner ends being provided with a screw thread n . And upon the screw-threaded inner end of the inner knob K, is secured the screw-threaded cam-arm L, the hub o of which is provided with the set screw p , whereby when the knob K has been properly adjusted to the side of the plate B, by the screwing up of the said cam-arm, then by means of the said set screw the said cam-arm will be held in place, and any future wear at the joint between the knob and the side plate to which it is attached may be readily taken up. The cam-arm L is provided at its outer end with the double acting inclined cam M, and the intermediate member E, is provided with the stud s and its anti-friction roller t , which are so arranged relatively to the said cam, that upon the movement of the knob K, in either direction from its normal position, the action of an inclined face u , of the cam, upon the anti-friction roller t , will cause the movement of the intermediate member E, transversely of the rigid lock or latch frame in the horizontal plane of the pivotal movement of the latch bolt D, and the consequent inward movement of the said latch bolt. The intermediate member E, is also provided with the stud s^1 , which has the anti-friction roller t^1 ; and the knob K¹ of the outer plate A, is provided with the attached cam-arm L¹, which is secured to the screw-threaded inner end of the said knob, and is provided at its outer end with the double acting inclined cam M¹, the angularly inclined cam-faces $u u$, of which, are adapted to act upon the said stud s^1 and its anti-friction roller t^1 , to cause the transverse movement of the intermediate member E, and the consequent inward movement of the latch bolt D, upon the rotary movement of the knob K¹, in either direction from its intermediate position, in which position it is normally held by the action of the spring F upon the operatively connected intermediate member E, the angularly inclined faces $u u$ of the cam M¹ serving to carry the said knob K¹ back automatically to its normal position

from its extreme of movement therefrom in either direction.

The outer knob K¹ is provided with the contained "Yale" lock N, to the inner end of the cylinder O of which is secured the cam-arm L², by means of the screws $x x$. The said cam-arm L², is provided at its outer end with the double-acting inclined cam M², which like the cam-arm L¹ of the knob K¹, acts upon the stud s^1 , and its anti-friction roller t^1 , to cause the inward movement of the latch bolt D, whenever the cylinder O of the lock is turned in either direction from its normal position by means of the key P.

In order to lock the door so that it cannot be opened from the outside by means of the knob K¹, but must be opened by means of a key, I provide the cam-arm L¹, with an extension arm Q, which is provided at its turned up end with the perforation v , the said perforation being adapted to receive the inner end of the sliding locking pin r , which pin is brought forward for locking engagement with the extension arm Q, by pressing inwardly upon the outer end of the said locking pin r , and is withdrawn from such engagement by pressing inwardly upon the end of the reversing pin q . The reversing pin q is connected with the locking pin r , by means of the intermediate semi-cylindrical rocking piece y , which is held in the cylindrical chamber z , as shown in Fig. 4, the inward movement of the projecting end of the locking pin r causing the corresponding outward movement of the end of the reversing pin q , into the countersunk recess w , of the front plate C, in which plate the said pins are held. The rigid frame of the lock or latch is to be secured firmly to the door by means of the screws R R, which serve to hold the tie-arms G G against the bottom of the notch which is to be cut in the edge of the door to receive the lock or latch mechanism.

A modification of my invention is shown in Figs. 13 and 14, in which the intermediate member E¹, is formed of a flat plate, and pivoted at one end l^1 to the backwardly extending arm b , of the latch bolt D, the opposite end j^1 , being loosely held between the lugs $h^1 h^1$, at the inner side of the inner plate B of the frame. The flat intermediate member E¹ is provided with the double-acting inclined cams j, j^1, j^2 , which are operated upon by the pins i^1, i^1 , of the rigidly attached arms L L¹, of the knobs K K¹, and the arm L² of the lock cylinder of the said knob K¹. And upon the rotary movement of the knobs in either direction, an inward movement will be imparted to the latch bolt, by the action of the pin i^1 , upon the inclined surface u , of the cam. The spiral spring F¹, is attached at one end to the arm b , of the latch bolt, and at the opposite end to the inner plate B, of the frame and serves to hold the latch bolt in its outward

position, from which it may be drawn inward by the rotary movement of the knobs. The screws S, S, by means of which the rim-plate is adjusted to the side of the stile of the door, 5 may be arranged so as to be accessible from the outer side of the inner plate B, instead of from the inner side of the same, as shown in Fig. 15.

As shown in the drawings, the rotary 10 movement of the knobs in either direction will cause the inward movement of the latch-bolt, but in some cases it may be desirable to provide for the movement of the knobs in one direction only, and in this case 15 one of the inclined cam-faces *u* may be dispensed with.

I claim as my invention:—

1. In a lock or latch, the combination of the inner and outer frame plates, the front 20 plate perforated to receive the fastening screws, the inwardly extending guides for the fastening screws, made integral with the front plate, and the tie-bars made integral with the said inwardly extending guides and 25 with the inner frame plate.

2. In a lock or latch, the combination of the frame plates rigidly connected together, with a rotary knob, the pivoted latch bolt, the intermediate member operatively con- 30 nected with the latch bolt and arranged for transverse horizontal movement in the plane of the movement of the said latch bolt, and means for operatively connecting the said intermediate member with the rotary knob.

3. In a lock or latch, the combination of the frame plates rigidly connected together, the pivoted latch bolt, and the intermediate member operatively connected with the latch bolt and arranged for transverse horizontal 40 movement in the plane of the movement of the said latch bolt, with a rotary knob provided with a rigidly attached arm which serves to impart movement to the intermediate member with the resulting inward move- 45 ment of the latch bolt, upon the rotary movement of the knob.

4. In a lock or latch, the combination of the frame plates rigidly connected together, the pivoted latch bolt, the intermediate 50 member operatively connected with the latch bolt and arranged for transverse horizontal movement in the plane of the movement of the said latch bolt, the rotary knob, an arm rigidly attached to the knob, and an 55 inclined double acting cam-surface arranged upon the said arm, whereby the movement of the knob in either direction will cause the inward movement of the latch bolt.

5. In a lock or latch, the combination of 60 the frame plates rigidly connected together, the pivoted latch bolt, the intermediate

member operatively connected with the latch bolt and arranged for transverse horizontal movement in the plane of the move- 65 ment of the said latch bolt, the rotary knob, a tumbler lock inclosed in the knob, an arm rigidly secured to the cylinder of the said lock, and operating upon the said intermediate member to cause the inward movement 70 of the latch bolt, whenever a turning movement is imparted to the lock cylinder by means of the key.

6. In a lock or latch, the combination of the inner, outer and front plates rigidly connected together, the pivoted latch bolt, and 75 the intermediate member operatively connected with the latch bolt and arranged for transverse horizontal movement in the plane of the movement of the said latch bolt, the outer knob, the extended arm rigidly at- 80 tached to the outer knob and provided with a perforation at its outer end, operative connection between the said arm and the said intermediate member, the sliding locking pin held in the recess of the front plate, the re- 85 versing pin adapted to retract the said locking pin from its engagement with the said extended arm and the rocking piece for operatively connecting the said pins.

7. In a lock or latch of the character de- 90 scribed, the combination of the frame plates rigidly connected together, a rotary knob provided with a screw thread at its inner end, the screw-threaded arm screwed upon the end of the knob and serving to hold the said 95 knob closely against the side of the frame plate, and means for holding the said arm in its set position, with the pivoted latch bolt, and connecting means for imparting inward movement to the latch bolt from the move- 100 ment of the said arm by the rotation of the said knob.

8. In a lock or latch, the combination of a rigid lock or latch frame, with an adjustable rim-plate extending around the edge of the 105 inner plate of the said frame, and the adjusting screws whereby, by the screw adjustment of the said rim-plate, the said rigid lock or latch frame is made applicable to doors of different thicknesses. 110

9. A rigid lock or latch frame, made of greater width than the thickness of the doors to which it is to be applied, in combination with a rim-plate connected to the said lock or latch frame, by means of adjusting screws, 115 which are only accessible from the inner side of the frame plate to which the rim-plate is attached.

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Witnesses:

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