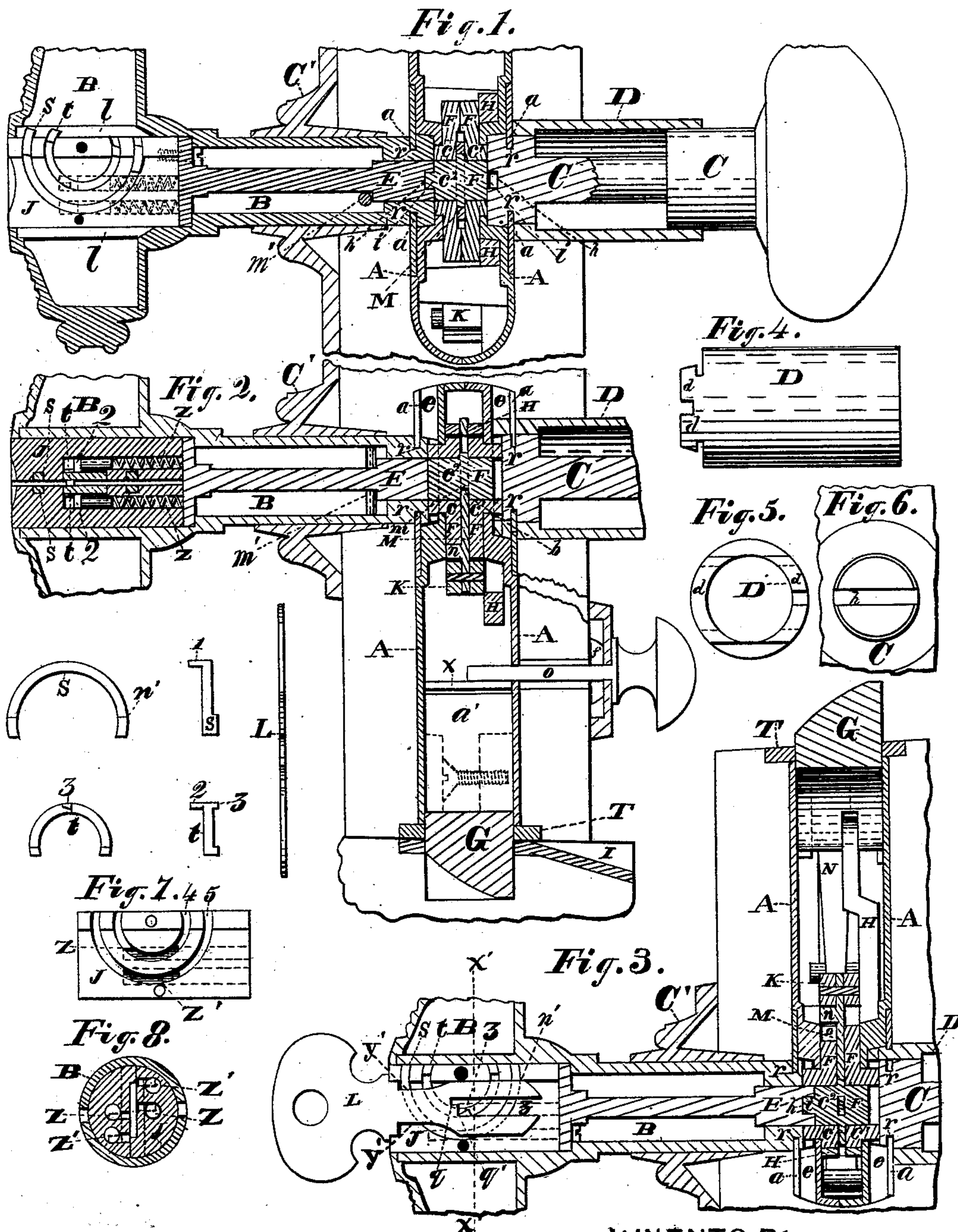


G. J. DICKSON.
Locking Latch.

No. 235,137.

Patented Dec. 7, 1880.



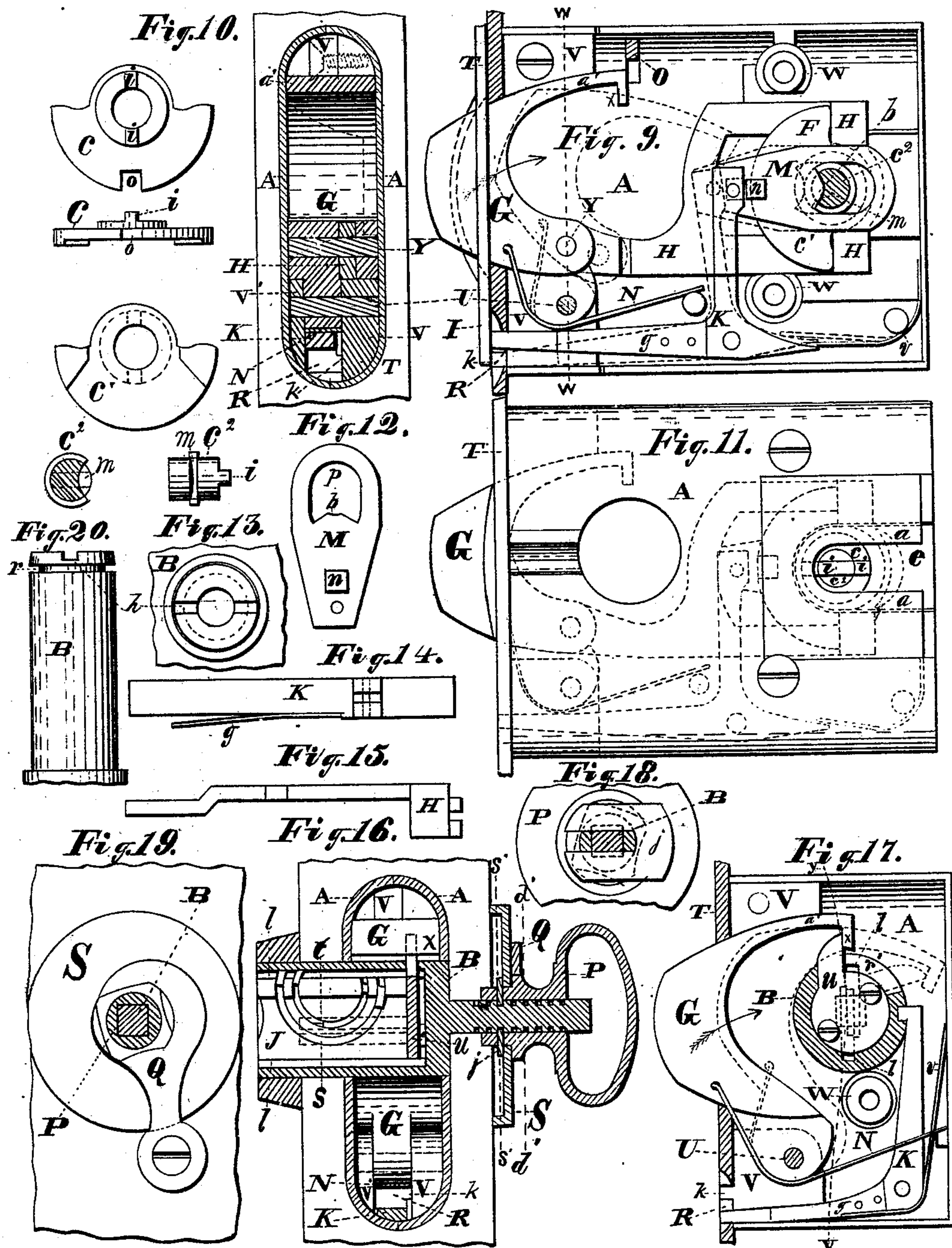
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UNITED STATES PATENT OFFICE.

GILBERT J. DICKSON, OF ALBANY, NEW YORK.

LOCKING-LATCH.

SPECIFICATION forming part of Letters Patent No. 235,137, dated December 7, 1880.

Application filed January 26, 1880.

To all whom it may concern:

Be it known that I, GILBERT J. DICKSON, of the city and county of Albany, and State of New York, have invented a new and useful
5 Improvement in Locks, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings, which are in two sheets, and making a part thereof.

10 This invention relates more particularly to that class of locks known as "locking-latches and locks," in the construction of which the spindle passes through the hub or follower which operates the latch-bolt, the knobs are se-
15 cured on the ends of said spindle on each side of the door, and the only bearings or guides are the roses, and in which also the latch-bolt has a direct sliding movement at right angles to the striker or movement of the door when
20 forced or drawn into the case in closing the door.

The great difficulty in this class of locks arises from the said sliding movement of the latch-bolt, which requires so much force to
25 crowd it back into the case against the bolt-spring as to often necessitate the withdrawal of said bolt by the knobs in closing the door.

It is well understood by those conversant with locks that this movement of the latch-
30 bolt by the striker has a tendency to cut and wear the bearings of said bolt unevenly by the continual jar and beating produced in closing the door, as well as to disarrange the works generally; and the universal habit of closing
35 the door by slamming it often bends the stem of the bolt when it does not move back readily, thereby rendering it inoperative, and from the instability of the spindle-bearings, which are the roses, and the shrinkage of the door,
40 which permits a seesaw and lateral movement of the spindle in the hub or follower, which of itself would soon destroy the perfect working of the lock and render the latch-bolt inoperative by unnecessary friction.

45 The object of my invention is chiefly to avoid these difficulties by constructing a locking-latch, or lock in which the knobs are separately attached to the latch-bolt case by their shanks without the use of spindles through
50 the hub or follower, and are provided with suitable bearings independent of the rose or

door, and in which also the latch-bolt moves around a pivot instead of sliding, as in other locks.

The nature of my invention consists in the
55 novel construction and arrangement of parts, whereby the latch-bolt is pivoted to the face-plate or case of the lock and has an oscillating movement, instead of sliding, when operated, the arrangement also being such that the ten-
60 sion of the latch-bolt spring is greater when operated by the knobs than by the striker; further, in the novel construction and arrangement of the hub or follower and knob-shanks
65 and the mode of attaching said knob-shanks and their bearings to the latch-bolt case or body of the lock without a spindle passing through the hub or follower, so that either or both knobs may be detached therefrom alto-
70 gether, or an escutcheon may be substituted containing the key-plug and tumblers, through which the latch-bolt may be operated by the key, and whereby, also, one of the knobs may be made fast by a stop, while the other is free
75 to operate the latch-bolt, said stop being operative, either from the face-plate of the lock or through the center of the knob-shank, by a key, and when so operated by a key is auto-
80 matic; further, in a series of circular or arched tumblers so arranged that one or more of them move around a common center in circular
grooves formed in the key-plug, so as to en-
85 gage with the tubular arbor or case in which said plug rotates, to be disengaged therefrom by a key fitted to their combination; further, in the novel construction and arrangement of
a key-plug and latch-bolt, whereby said key-
90 plug may be rotated on one side of the door by means of a knob and the other side by the key, and adjustable to the thickness of the door; finally, in a key-plug within the knob of
a lock and connecting with the hub or fol-
lower thereof, as will be hereinafter more fully set forth.

In the drawings, Figure 1 is a cross-section
95 of my improved locking-latch, taken through the center of the knob-shanks or spindle. Fig. 2 is a longitudinal section of the same, showing the works in a locked position. Fig. 3 is an opposite view from Fig. 2, showing
100 the works in an unlocked position. Fig. 4 is a longitudinal detached view of the knob-

shank bearing. Fig. 5 is an end view of the same. Fig. 6 is a view of the inner end of the knob C as shown in Fig. 1. Fig. 7 is a detached view of one-half of the key-plug. Fig. 8 is a cross-section of both halves of the key-plug and tubular arbor, taken through the line *xx* of Fig. 3. Fig. 9 is a side view of my improved lock with one-half of the shell removed, more clearly showing its internal construction. Fig. 10 is a cross-section of the same, taken through the line *W W*. Fig. 11 is a side view, the same as Fig. 9, with cap-half of shell in position, works shown by full and dotted lines. Fig. 12 is a detached side view of the knob-stop. Fig. 13 is an end view of the knob-shank B. Fig. 14 is a detached edge view of the spring-lever arm of the knob-stop M. Fig. 15 is a detached edge view of the rack H shown in Fig. 9. Fig. 16 is a cross-section of my improved lock when used as a key-latch on one side of the door and a knob on the other, or for narrow-stiled doors or windows. Fig. 17 is a side view of the same. Fig. 18 is a cross-section of the knob S, taken through the line *s' s'* of Fig. 16. Fig. 19 is a cross-section of the knob-shank and arbor, taken through the line *d' d'* of Fig. 16, showing the rose and device for making fast the arbor B. Fig. 20 is a longitudinal detached view of the outside knob-shank, B, with part broken away.

Similar letters of reference indicate corresponding parts in all the figures.

The latch-bolt case or body of the lock, as shown in Figs. 1, 2, and 3, Sheet 1, and 9, 11, and 17, Sheet 2, is formed in two half-shells, A A, as more clearly shown in Fig. 1, Sheet 1, and 9, Sheet 2, and fastened together with screws, as shown in Fig. 11, Sheet 2, and rounded at the edges, so as to be more easily let in the door. Said half-shells are provided with the dovetail or T-shaped grooves or cavities *ee*, and journal openings or holes for the hub or follower, as shown by full and dotted lines in Figs. 2 and 3, Sheet 1, and 11, Sheet 2, said openings and cavities coming directly opposite each other when the case is put together, as shown in Figs. 1 and 2, Sheet 1.

The hub or follower F, as shown in Figs. 1, 2, and 3, Sheet 1, and in detail in Fig. 9, Sheet 2, is composed of the arm-piece *c* and *c'* and center piece, *c²*, all of which rotate independently. The center piece, *c²*, is connected with the key-plug J by means of the shaft E of said plug through the center of the hollow knob-shank B, as shown in Figs. 1, 2, and 3, Sheet 1. The arm-piece *c'* is connected with the knob-shank C, by which it is operated, and the arm-piece *c* of the hub is connected to and operated by the outside knob shank or arbor, B, as shown more clearly in Fig. 1, Sheet 1. The said knob-shanks B and C have no connection with each other, and are fitted to turn freely in the bearing D and the rose C'. The rose may be sufficient when it can be well secured to the door, thereby dispensing with

the bearing D, as shown by the outside knob, B, in Figs. 1, 2, and 3, Sheet 1. Said knob-shanks and their bearings, when bearings are used, are fastened to the latch-bolt case or body of the lock by means of the dovetail or T-shaped tenons *d* on the end of the bearing D, as shown in Fig. 4, Sheet 1, and the grooves *r*, cut around the inner ends of the said knob-shanks B and C, as shown in Figs. 1, 2, and 3, Sheet 1, and 20, Sheet 2, entering the reverse corresponding cavities or grooves *ee* in the lock-case, as shown in Figs. 1, 2, and 3, Sheet 1, and 11, Sheet 2. The lips *aa* of said cavities, which are rigidly secured to the lock-case, at the same time enter the grooves *r* around the ends of said knob-shanks, as shown in Fig. 1, Sheet 1. The said knob-shanks and the key-plug J are coupled with the hub F or their respective followers by the tenons *i* on the ends of each piece of said hub, as shown in Fig. 1, Sheet 1, and in detail, Fig. 11, Sheet 2, entering the grooves or notches *h* in the ends of the said knob-shanks B and C and the key-plug shaft E, as shown in Figs. 1 and 2, Sheet 1, when said bearing and knob-shanks are fully inserted in the grooves or cavities *aa* of the lock-case, as shown more clearly in Figs. 1 and 2, Sheet 1. The knob-shanks and bearing are thus secured to the lock-case without a spindle passing through the hub or follower, as in other locks, and a steady and permanent bearing is provided for the knob-shanks, thereby preventing seesaw or lateral movement of the knobs, and dispensing with the use of nails in the neck of the knobs. The difference in thickness of doors is also provided for by the roses sliding on the knob-shanks or their bearings.

The latch-bolt G, as shown in Figs. 2 and 3, Sheet 1, and 9, 10, 16, and 17, Sheet 2, consists simply of the nose-piece pivoted to the face-plate or lock-case, the edges of said bolt being curved and tapering toward the nose. The portion within the case is concaved or hollowed out between the pivot and the sweeping-edge, so as to form the limb *a'*, with its inward projection *x*, as shown in Figs. 9 and 17, Sheet 2. Said bolt is so formed that it may be withdrawn by the key-plug, as shown in Figs. 16 and 17, Sheet 2, when there are no knobs used on the outside of the door, as more clearly shown in Fig. 16, Sheet 2, or when the latch is used with narrow-stiled doors or windows. Said bolt is pivoted between the lugs *v* and *v'* of the face-plate T, as shown more clearly in Figs. 9 and 10, Sheet 2, so as to swing into or out of the case when turned on its pivot, as shown by full and dotted lines in Figs. 9 and 17, Sheet 2, and it is provided with the spring N, secured to said bolt at one end and passing around the pivot and resting against a stud secured to the lock-case, as shown in Figs. 3, Sheet 1, and 9 and 17, Sheet 2, keeping said bolt in a shot position except when withdrawn or forced into the case. Said bolt is connected with the hub or followers by the

rectangular frame or rack H, which is hinged to it about midway between the pivot and the nose portion, as shown in Figs. 9 and 10, Sheet 2, thus making the tension of the bolt-spring N greater on the rack H, through which the bolt is operated by the knobs, than on the nose, where it is operated by the striker. By thus pivoting the latch-bolt the nose portion is given both an upward and horizontal movement when operated, as shown by the arrow in Figs. 9 and 17, Sheet 2, admitting of both an upward and horizontal incline being formed in the striker I and bolt G, as shown in Fig. 2, Sheet 1, and 9, Sheet 2, which prevents crowding or wedging, as in the direct horizontal movement.

The knob-shank B is made hollow, and extends through the knob and forms a part thereof, as shown in Fig. 1, Sheet 1, and is provided with the longitudinal tumbler-slots *l* in its opposite sides, between the walls of said knob, as shown in Figs. 1, Sheet 1, and 16 and 17, Sheet 2. Said knob is in two parts and fastened together, as shown in Fig. 1, Sheet 1.

The key-plug J, as shown in Figs. 1, 2, 3, 7, and 8, Sheet 1, and 16 and 17, Sheet 2, is made in longitudinal halves, with the key-slot formed partly in each half, as shown more clearly in Figs. 7 and 8, Sheet 1; and is provided with the circular tumbler-grooves 4 and 5 in each half, said grooves commencing and terminating on the same side of the key-plug and on nearly the same plan with the key-slot as shown in Figs. 7 and 8, Sheet 1, so that when the halves are placed together, as shown in Fig. 8, the key-slot is formed between the tumbler-grooves of the halves. Said halves are also provided with the longitudinal spring-chambers Z and Z', one connecting with each tumbler-groove, as shown in Figs. 2, 7, and 8, Sheet 1, in such a manner as to allow the springs contained therein to engage with their respective tumblers *s* and *t* in each of the halves of the key-plug, which are also circular or arcs conforming to the respective grooves in which they oscillate or move around their centers against their respective springs contained in the spring-chambers Z and Z' when operated, as more clearly shown in Figs. 1 and 2, Sheet 1. Said tumblers have also half of the key-slot formed in each, the same as the halves of the key-plug, as shown in detail in Fig. 1, Sheet 1. The tumblers *s* have the stud or projection 1 on the back of each, and the tumblers *t* have the stud 2 on their back and the stud 3 on their face, as shown in detail in Fig. 2, Sheet 1. The studs on the back of each of said tumblers connect with their respective spring-chambers in the key-plug, as before mentioned, in such a manner as to engage with the spring-pins contained therein, as shown in Fig. 2, Sheet 1, which press against said tumblers, keeping one end of each of them projected into the tumbler-slot *l* of the tubular arbor B, as shown in Figs. 1, Sheet 1, and 16, Sheet 2.

The key L, a simple form of which is shown

in Fig. 3, Sheet 1, and in detail, is what is known as a "flat" key. It is provided with the longitudinal slot *z*, the end of which is notched at *q* and *q'*. Said key is also notched on the edges at *y'* and beveled at the point, as shown in Fig. 3, Sheet 1. Said key operates the tumblers *s* from its opposite edges, and the tumblers *t* from the notched end of the slot *z*, as also shown in Fig. 3, Sheet 1. (All the tumblers may be operated from the edges or end of the key, as desired.)

Operation: As said key is being inserted its beveled point engages with the shoulders *n'* of the tumblers *s*, moving them around their centers in their respective grooves against their respective springs contained in the spring-chambers Z and Z' of the key-plug, withdrawing their projecting end out of the slot *l* of the tubular arbor and within the outer circumference of the key-plug, which brings the shoulder *n'* of the tumblers *s* into the notches *y'* of the key, the notched end *q* and *q'* of the slot *z* at the same time engaging with the studs 3 of the tumblers *t*, moving them in a similar manner to tumblers *s*, bringing their projecting ends also within the outer circumference of the key-plug and disengaging said plug from the tubular arbor and allowing it to rotate, as shown in Fig. 3, Sheet 1.

It will be noticed that both ends of the tumblers are liable to engage with the tubular arbor, so that if said tumblers are moved beyond a certain point either way they will prevent the key-plug from rotating, as shown more clearly in Fig. 1, Sheet 1. In the unlocked position, as shown in Fig. 1, Sheet 1, the key and plug are capable of an unlimited number of revolutions, the key being removable at every semi-revolution, and when said key is removed the tumblers are thrown into a locked position by their respective springs, as shown in Figs. 1, Sheet 1, and 16, Sheet 2. The key can only be removed when the tumblers are opposite the slots or grooves *l* in the tubular arbor.

The halves of the key-plug J may be fastened together by screws, as shown, or in any other suitable manner. Said plug is connected with the center piece, *c*², of the hub F by the shaft E, as before mentioned, and held in position by the pin *m'*, as shown in Fig. 1, Sheet 1.

The outside knob-shank, B, may be made fast by the stop M, as shown in Figs. 2 and 3, Sheet 1, and 9 and 12, Sheet 2. Said stop is arranged so as to be operated either from the face-plate of the lock by the spring lever-arm K, which extends through said face-plate T, as shown in Figs. 9 and 17, Sheet 2, or by the key through the center of the knob-shank B, as shown in Fig. 3, Sheet 1. Said stop is made of thin plate-steel and having in its wide end the elongated opening *p*, one end of which is concave, the other being convex or tooth-shaped, as at *b*, and on one side the stud *n*, as shown more clearly in

Fig. 12, Sheet 2. The small end of said stop is pivoted to the spring lever-arm K. The other and open end passes between the arm-pieces *c* and *c'* of the hub F, as shown in Figs. 2 and 3, Sheet 1, and 9, Sheet 2, so that the center piece, *c*², of the hub F, which is provided with the transverse concave notch *m* in one side, as shown in Figs. 2 and 3, Sheet 1, and 9 and in detail, Sheet 2, passes through the said opening *p*, so that the slot *m* is on a plane with the convex end *b* of the opening *p* of said stop, and kept from lateral movement by the flange around said center piece, *c*², which is the same thickness as the stop M, as shown in Figs. 2, Sheet 1, and 9, Sheet 2. The arm-piece *c*, as shown in detail, forms a semi-circle between its opposite arms, and is provided with the notch *o*, as shown in Fig. 3, Sheet 1, and detail, Sheet 2, into which the stud *n* of the stop M slides when the concaved notch *m* of the center piece, *c*², of the hub F is turned toward the convex end of the opening *p* of said stop, as shown in Figs. 2, Sheet 1, and 9, Sheet 2. thus securely fastening the arm-piece *c*, to which is connected the outside knob-shank, B, as shown in Figs. 1 and 2, Sheet 1. In this position said stop is automatic when operated by the key, unless the key and plug are turned half-way around and key removed, which will leave the knob free. Thus by turning the key and plug quarter around either way from a locked position, as shown in Figs. 2, Sheet 1, and 9, Sheet 2, the convexed or tooth-shaped end of the opening *p* of the stop M is moved out of the transverse notch *m* of the center piece, *c*², of the hub F, sliding the said stop back against the spring lever-arm K, thereby removing the stud *n* out of the notch *o* of the arm-piece *c* of the hub F, allowing it to rotate and withdraw the latch-bolt, as shown in Fig. 3, Sheet 1, and by dotted lines in Fig. 9, Sheet 2, and when the key and plug are turned back again said stop is thrown into a locked position by the spring lever-arm, as before. The said stop may also be thrown off and the key removed, leaving the knob free, as before mentioned, by turning the key and plug half-way around from a locked position and removing the key. The convex end *b* of the opening *p* of the stop M will then rest on the flange of the said center piece, *c*², of the hub F opposite the notch *m*. In this case the knob can only be made fast again by the key; but in order that the knob may be made fast or loose without the key the slot R in the face-plate T, through which the lever-arm K extends, is provided with the side notch, *k*, as shown in Figs. 9, 10, 16, and 17, Sheet 2, into which the lever-arm K is thrown by the spring *g*, secured to said lever, as shown in Fig. 14, Sheet 2, when said lever is pressed down by the thumb, holding said lever and stop in an unlocked position, as shown by dotted lines in Fig. 9, Sheet 2. When it is desired to make the knob fast again the said lever-arm need

only be disengaged from the notch *k*, when it will be thrown into a locked position, as before, by the spring *v* resting against the heel of said lever-arm, as shown in Figs. 9 and 17, Sheet 2.

This invention is particularly well adapted to key-latches or locks operated on one side of the door by a key only and on the other by a knob, or to thumb-piece or locking-latches for narrow-stiled doors or French windows. When used as such the knobs, hub, or follower and rack are dispensed with and the lock-case made shorter, as shown in Fig. 17, Sheet 2.

The arbor B, which contains the key-plug and tumblers, is modified, as shown in Fig. 16, Sheet 2, and passes entirely through the door and lock directly behind the concave of the latch-bolt, as shown in Fig. 17, Sheet 2, and is provided with a stem having a series of take-up notches or key-seats, and to which is fastened the knob P by means of the key *j*, as shown in Figs. 16 and 18, Sheet 2. The key-plug J in this case has secured to its inner end the arm *u* instead of the shaft E, as in the knob-lock shown in Figs. 1, 2, and 3, Sheet 1. Said arm projects through the transverse slot *r'* in the tubular arbor B, as shown in Fig. 17, Sheet 2, so as to engage with the inward projection *x* on the limb *a'* of the latch-bolt G, as shown in Figs. 16 and 17, Sheet 2, so that when the key-plug is unlocked from the arbor and rotated the arm *u* travels in the said transverse slot *r'* in withdrawing the latch-bolt, and when the key-plug is locked to the arbor B, as shown in Fig. 16, Sheet 2, and it is desired to withdraw the latch-bolt from the inside of the door, the arbor B is turned by the knob P, carrying the key-plug with it.

In order that the arbor may not be turned from the outside of the door, the shank of the knob P is made square, as shown in Fig. 19, Sheet 2, and provided with the hook Q, by means of which the arbor B is made fast, holding the latch-bolt either withdrawn or shot. Said arbor may also be made fast by the spring lever-arm K, as shown in Fig. 17, Sheet 2, so that the latch-bolt cannot be withdrawn from the inside of the door at all, and only by a key from the outside.

In putting the lock in the door the key-plug and arbor are passed from the inside and secured to the door by the rose S, and adjusted to the thickness of said door by means of the series of take-up notches or key-seats in the square stem of the arbor B, which enters a correspondingly-shaped socket in the knob P, which may be slid thereon to conform to the thickness of the door, and then secured by the key *j*, as shown in Figs. 16 and 18, Sheet 2, thus making said arbor self-adjusting.

The latch-bolt G may be locked on the inside of the door against any operations from the outside whatsoever by means of the slide-knob O, as shown in Fig. 2, Sheet 1, and 9, Sheet 2. Said slide is secured to the rose by the spring-washer *f*, as shown in Fig. 2,

Sheet 1. The rose of the slide-knob O is fastened to the door by means of screw-nails, so that the stem of the slide-knob passes through a slot in the lock-case made for that purpose directly behind the end of the limb *a'* of the latch-bolt G, as shown in Fig. 9, Sheet 2. Said slide may be moved up or down, and is held in either position by the spring *f*. When it is moved down it is brought behind the latch-bolt and prevents it from being withdrawn, and when raised to the top of the slot, as shown in Fig. 9, Sheet 2, the latch-bolt passes under it when withdrawn.

Having described my invention, what I claim is—

1. The knob-shanks B and C, provided with the groove *r* and notch *h*, in combination with the lips *a a* of the cavities *e e* of the latch-bolt case and the tenons *i* of the hub F, substantially as and for the purpose specified.

2. The hub F, having the tenons *i* and notch *o*, in combination with the knob-shanks B and C, key-plug J, rack H, and stop M, for the purpose and substantially as specified.

3. The key-plug J, having the locking-tumblers *s* and *t*, in combination with the knob-shank or arbor B and the center piece of the hub F, for the purpose and substantially as specified.

4. A series of circular or arched tumblers arranged to oscillate or rotate in correspondingly-shaped grooves formed in the longitudinal halves of the key-plug, and connecting with springs contained in the spring-chambers Z and Z', in combination with the arbor in which said plug rotates and key, for operation substantially as and for the purpose specified.

5. The cavities *e e* of the lock-case A A, having the lips *a a*, in combination with the knob-shanks B and C, bearing D, and hub F, for the purpose and substantially as specified.

6. The bearing D, having the tenon *d*, in combination with the lips *a a* of the cavities *e e* of the latch-bolt case A A and knobs of a lock, for the purpose and substantially as specified.

7. The stop M, provided with the stud *n*, opening *p*, having the inward convex or tooth-shaped end *b*, in combination with the lever-arm K and hub F, for the purpose and substantially as specified.

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