

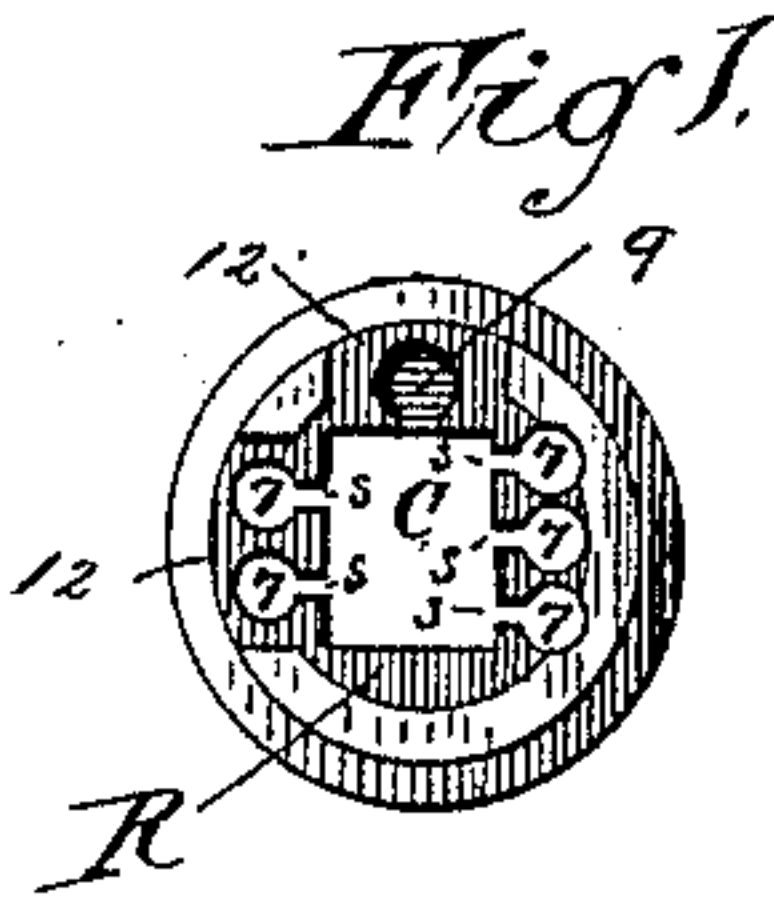
(Model.)

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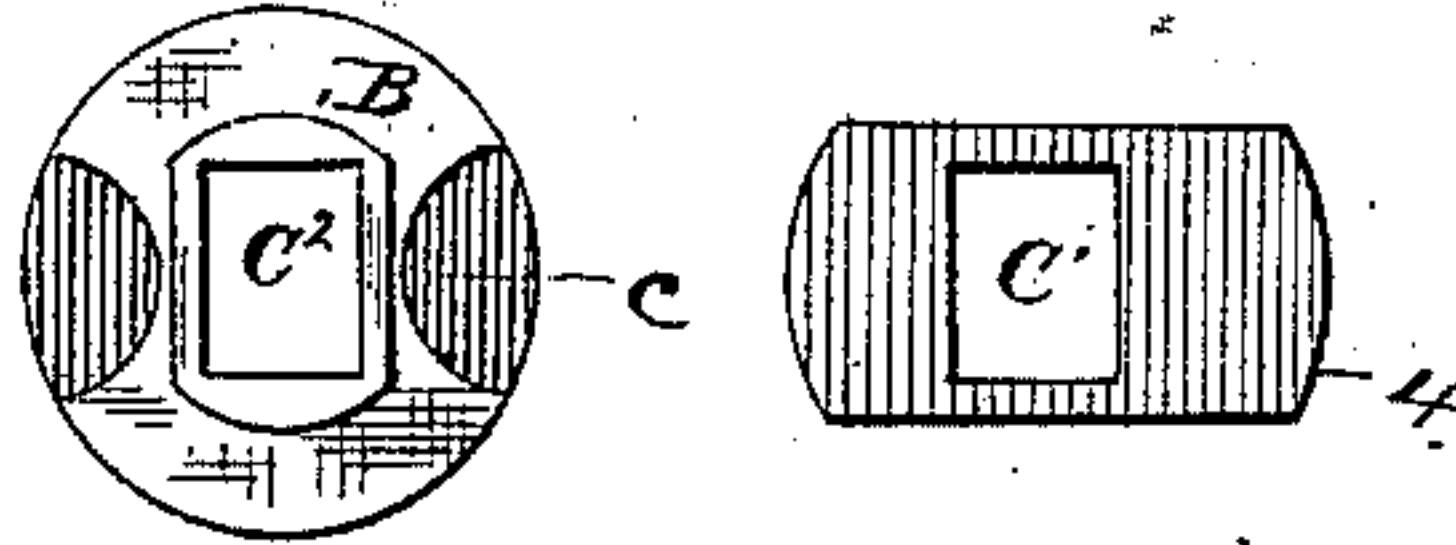
J. SCHADE.  
LOCK.

No. 421,977.

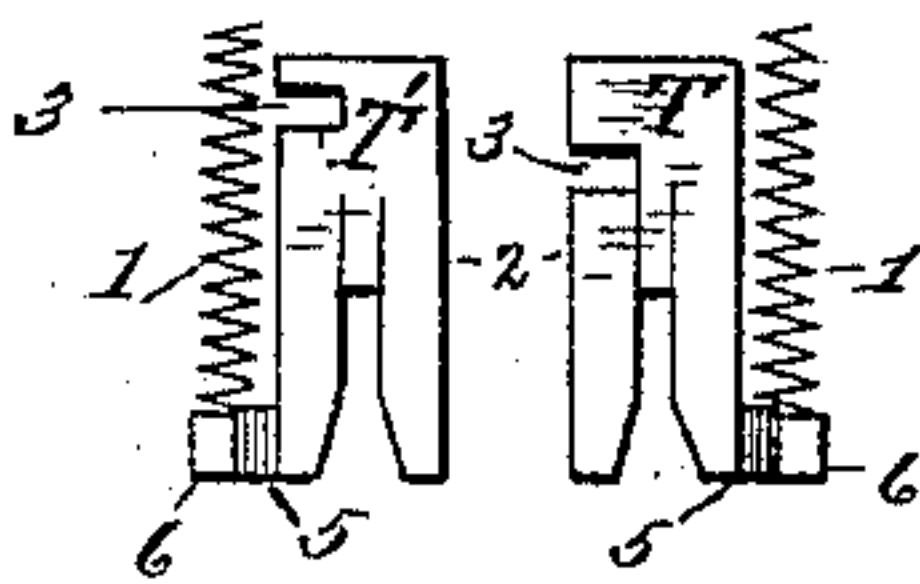
Patented Feb. 25, 1890.



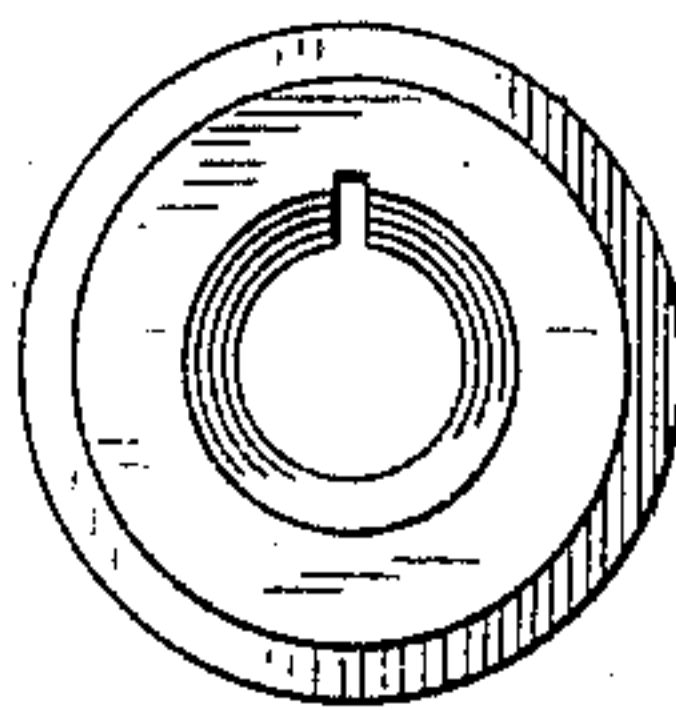
*Fig 5*



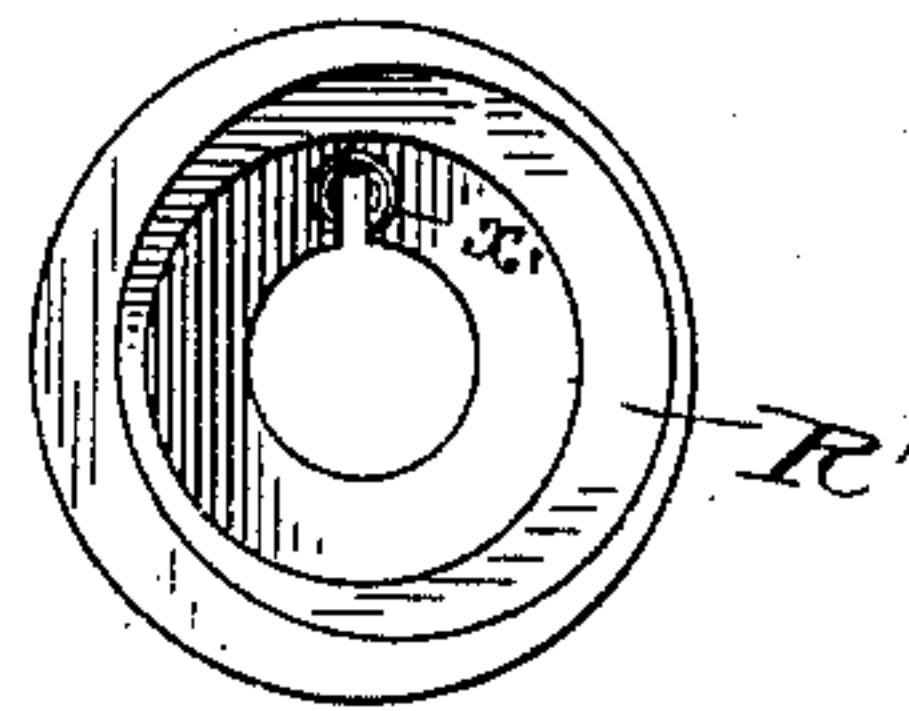
*Fig 2.*



*Fig 6.*



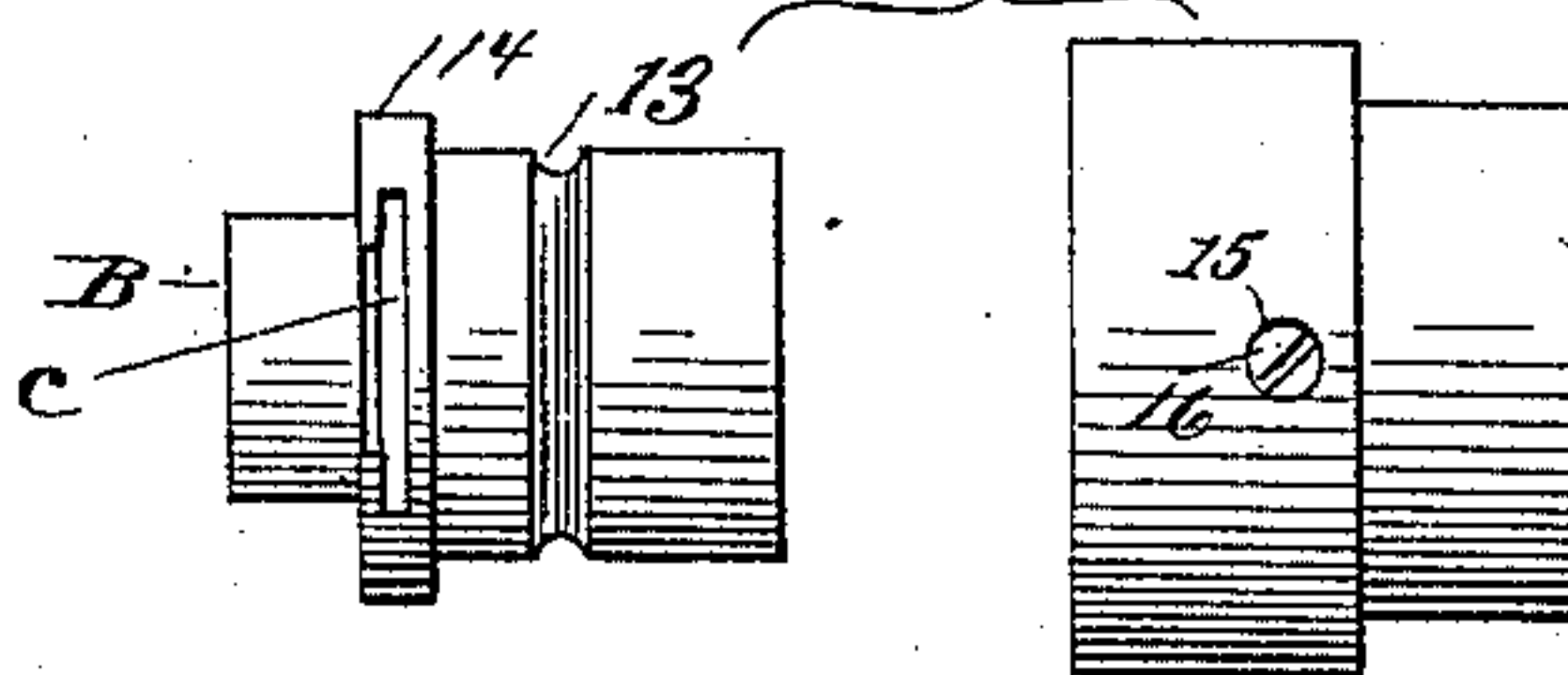
*Fig 7.*



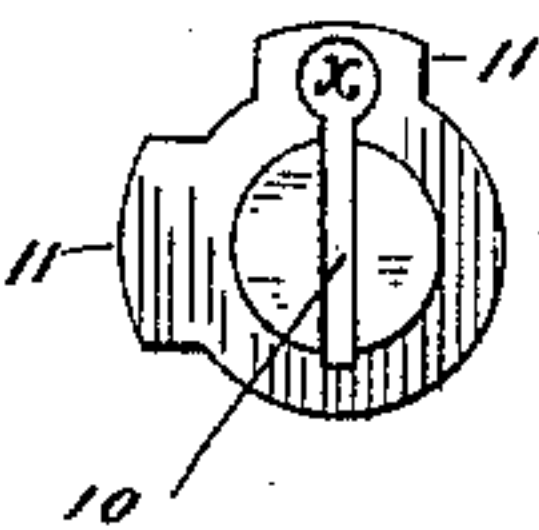
*Fig 3.*



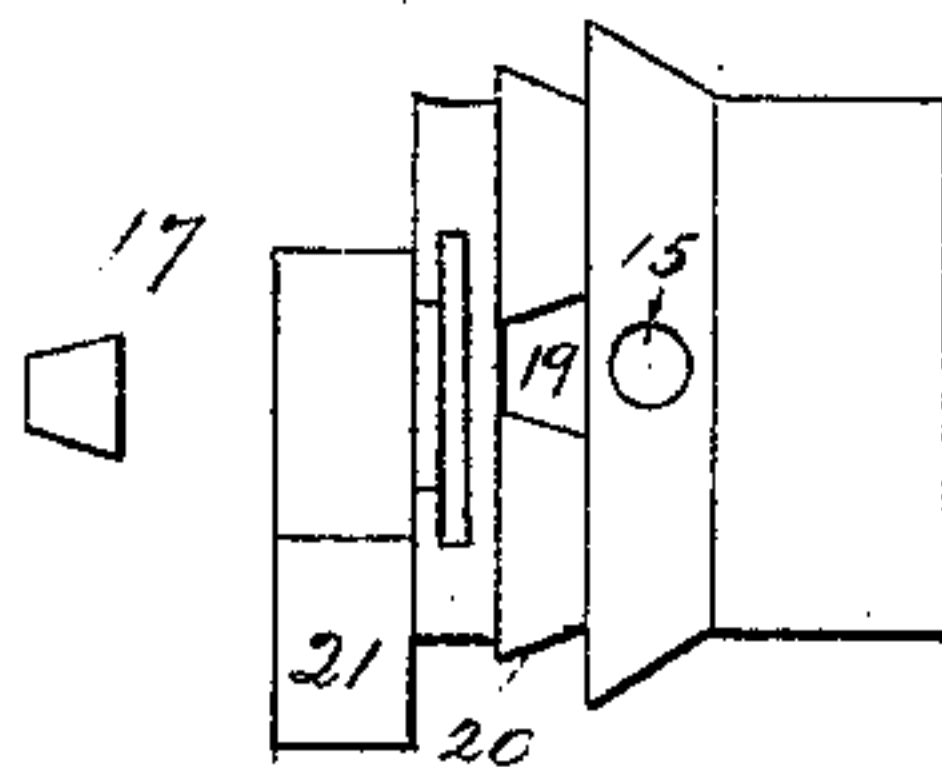
*Fig 8*



*Fig 4.*



*Fig 9.*



WITNESSES:

*W. D. C. Boggs*

INVENTOR

*John Schade*

(Model.)

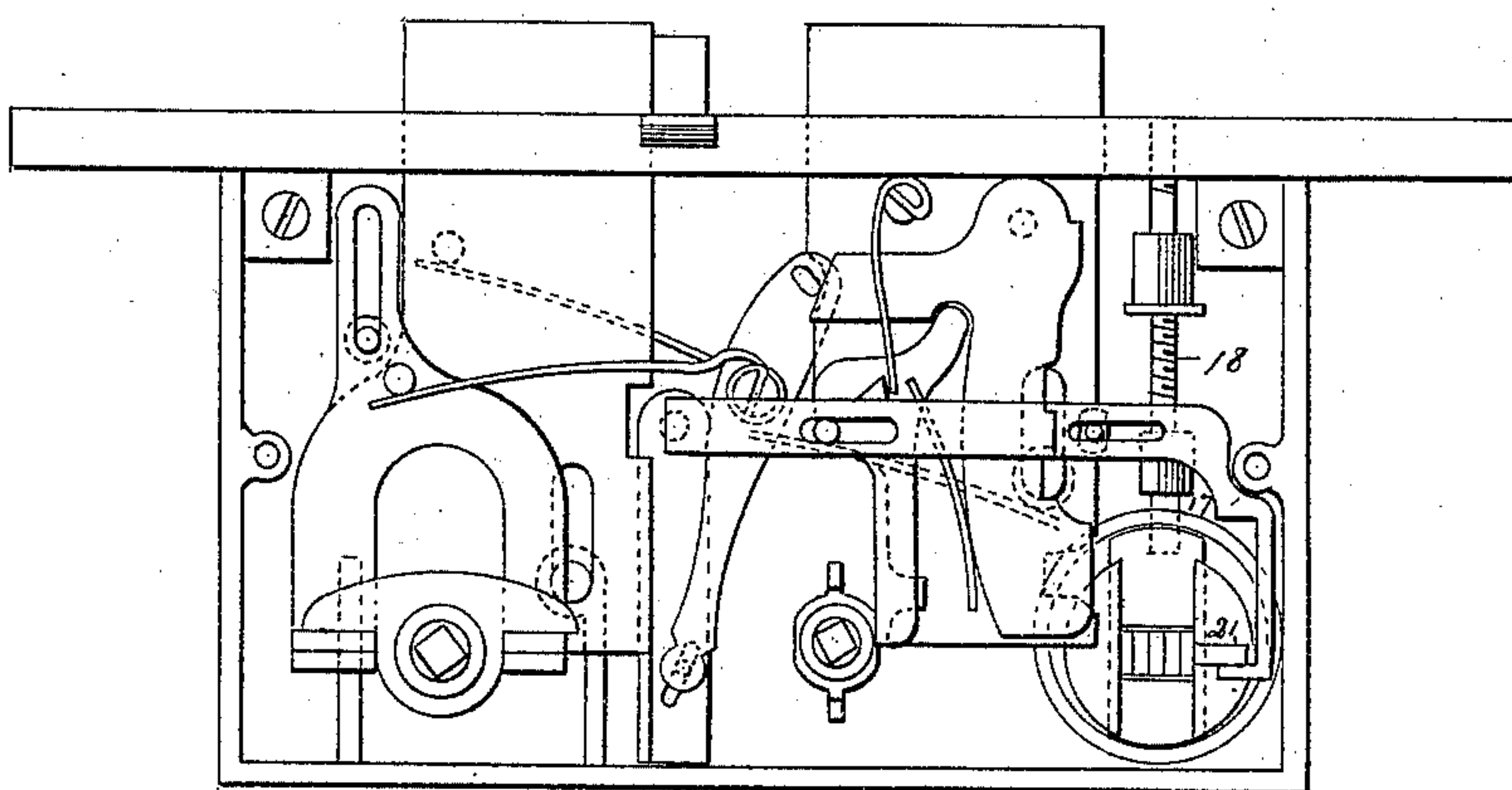
2 Sheets—Sheet 2.

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No. 421,977.

Patented Feb. 25, 1890.

*Fig 10*



WITNESSES:

*Wm Benjamin*  
*W. C. Hogg*

INVENTOR

*John Schade*



# UNITED STATES PATENT OFFICE.

JOHN SCHADE, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE HOPKINS & DICKINSON MANUFACTURING COMPANY, OF SAME PLACE.

## LOCK.

SPECIFICATION forming part of Letters Patent No. 421,977, dated February 25, 1890.

Application filed January 8, 1889. Serial No. 295,771. (Model.)

*To all whom it may concern:*

Be it known that I, JOHN SCHADE, a citizen of the United States, residing at the city of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Cylinder-Locks, of which the following is a specification, the accompanying illustrative drawings forming a part thereof.

Similar letters and numerals indicate similar parts in the several views.

The ends attained by my improvements will successively appear in the progress of the specification. The cylinder-lock consists of two principal parts—the plug and the shell. The plug and its concomitants are illustrated in Figures 1, 2, 3, 4, and 5. The shell and its concomitants are illustrated in Figs. 6 and 7.

Fig. 1 is a front end view of the plug. Fig. 2 is a plan view of the two forms of the tumblers employed and their driving coiled springs. Fig. 3 is a plan of the key stop-pin and its driving coiled spring. Fig. 4 is a face view of the cap or disk located in the front end of the plug. Fig. 5 is a rear end view of the plug with the sliding fence in position to enter its channel. Fig. 6 is a front end view of the shell. Fig. 7 is a rear end view of the shell. Fig. 8 is a plan view of the plug and shell as the plug is about to enter to its place within the shell. Fig. 9 is a plan view of the shell, showing the dovetail locking-slot in its undercut joint and the dovetail slide by which the cylinder-lock is secured in place when combined with a mortise-lock; and Fig. 10 is a view of the inner mechanism of a mortise-lock with the combined cylinder-lock secured in place.

I construct the plug of a single piece of metal.

C is the ordinary rectangular channel cut through the plug from end to end, within which the five usual tumblers are located and driven backward by the key and then forward by the coiled springs 1, behind their arms 6, when the key is withdrawn. Three of these tumblers are constructed in the usual form, like T, and two of them in the corresponding form, like T', with notches 3 for engaging the edge of the rectangular opening C' in the

usual sliding fence 4 at the rear end of the plug.

My first improvement is presented here in the grooves 5, cut on both sides of the arm 6 of the several tumblers at the like point near their angle. The purpose of these grooves will best appear in connection with the description of the cylindrical sockets 7, which I drill in the plug at its front end for receiving the driving coiled springs 1 of the tumblers. Heretofore the functions of these sockets has been performed by what may fittingly be called "rectangular stalls" opening wide into the rectangular channel C. By substituting these cylindrical sockets, communicating by narrow openings s with the rectangular channel C, I furnish both support and protection to the driving coiled springs of the tumblers, while the arms of the tumblers, by means of the grooves 5 and the corresponding guides in the oppositesides of the narrow openings s, formed with tongues fitted to enter said grooves, slide up and down in line within the said narrow openings without tipping or tilting laterally. The outside cylindrical portion of the plug is constructed substantially as heretofore. The stop-pin, Fig. 3, with its encircling driving-spring 8 and receiving-socket 9, bored in the front end of the plug, are formed as heretofore. The disk, Fig. 4, with its slot 10 for the passage of the key, and its hole x for the head of the stop-pin to slide in, and its lugs 11, fitting into outlets 12, cut in the rim of the counterbored recess R in the front end of the plug, are all constructed substantially as before.

My second improvement appears at the rear end of the plug, where I construct integral with the plug the box B, with a rectangular channel C'', equal in area to the channel C, and, in effect, extending the channel C, so as to give stability to the tumblers and prevent them from tilting sidewise, as they are inevitably inclined to do without such protection as this box affords.

A third improvement appears here, too, in the form of a thin transverse rectangular channel c in the plug, located in front of the box B, for receiving the sliding fence 4. This fence, with its opening C', of equal area with the channel C, is constructed as heretofore.



The location of this channel *c* in front of the box, as is plainly seen, presents, in connection with the box, an important improvement in the lock.

5 My fourth improvement appears in the eccentric recess *R'*, formed in the rear end of the shell for operating the sliding fence 4. Heretofore this eccentric recess has been constructed in the case of the lock, with which  
10 the cylinder-lock has been combined. When so constructed, the use of the cylinder-lock is restricted to combination with the mortise-lock; but by constructing the eccentric, as I have done, in the end of the shell the use of  
15 the cylinder-lock is extended to combination with any and all other locks. In other respects the shell with its recess *x'* for the head of the stop-pin is constructed substantially as heretofore.

20 My fifth improvement appears in the manner of locking the shell to the plug. To do this I cut a groove 13 around the outside of the plug, perpendicular to its axis, just in front of the shoulder 14. I also form two threaded  
25 holes 15 in the shell at such opposite points as will bring the groove 13 directly under them when the plug is in place within the shell. Two screws 16, constructed with rounded points and of proper length, now introduced into these holes will lock the shell and  
30 plug together and still permit the plug to revolve within the shell.

The cylinder-lock constructed as now described may be secured to the door or to any  
35 lock-case in any desired manner, and its dog for operating the bolt of the lock with which it is combined may be attached to the plug in any desired manner. One method, which I here illustrate, is by the use of the dovetail  
40 slide 17, which is lowered by the screw-rod 18, attached to the case of the mortise-lock, into the dovetail slot 19, formed in the undercut joint 20 at the rear end of the shell. By this means I secure the cylinder-lock to the mortise-lock as firmly as if it were constructed integral with it. In this exceptional case the  
45 dog 21, which operates the bolt of the mortise-lock, is formed, as heretofore, upon the rear end of the plug.

50 Having described my improvements, what I claim as my invention, and desire to secure by Letters Patent, is—

1. In a cylinder-lock, the shell formed with the eccentric recess in the rear end thereof, substantially as hereinbefore described. 55

2. In a cylinder-lock, the tumblers formed with grooves in the opposite sides of their arms to receive the guides formed in the opposite sides of the narrow openings between the cylindrical coiled spring-sockets of the  
60 plug and the rectangular channel passing lengthwise through it, substantially as and for the purpose hereinbefore described.

3. In a cylinder-lock, the tumbler-guides fitted to enter the grooves in the opposite sides  
65 of the arms of the tumblers, substantially as and for the purpose hereinbefore described.

4. In a cylinder-lock, the combination of the locking-groove around the plug with the locking-screws passing through the shell, substantially  
70 as hereinbefore described.

5. In a cylinder-lock, the box formed in the plug between the rear end thereof and the thin rectangular channel passing transversely through the plug, in combination with the  
75 tumblers formed with grooves in the opposite sides of their arms, and the thin rectangular channel passing transversely through the plug formed in front of said box, and the sliding fence within said channel, substantially as  
80 and for the purpose hereinbefore described.

6. In a cylinder-lock, the plug formed with cylindrical coiled spring-sockets in the front end thereof and with tumbler-guides between  
85 them, and the parallel rectangular channel passing lengthwise through the plug, the guides fitted to enter the grooves in the opposite sides of the arms of the tumblers, the plug formed also with the box in the rear end thereof and with the thin rectangular chan-  
90 nel passing transversely through it in front of said box, in combination with the sliding fence within said thin rectangular channel, the tumblers formed with grooves in the opposite sides of their arms, the locking-groove  
95 around the outside of the plug, and the locking-screws passing through the shell, substantially as hereinbefore described.

JOHN SCHADE.

Witnesses:

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W. D. C. BOGGS.