

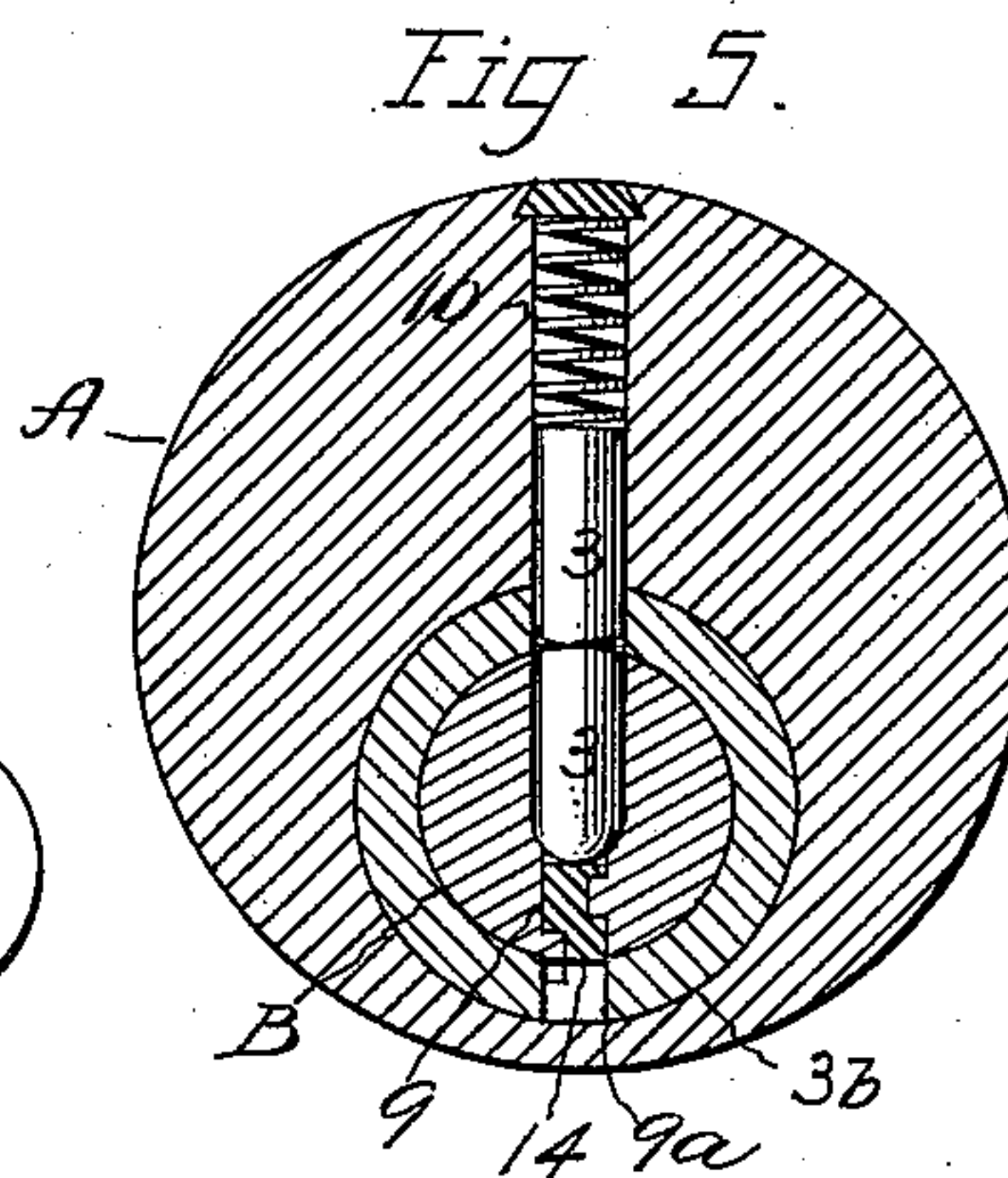
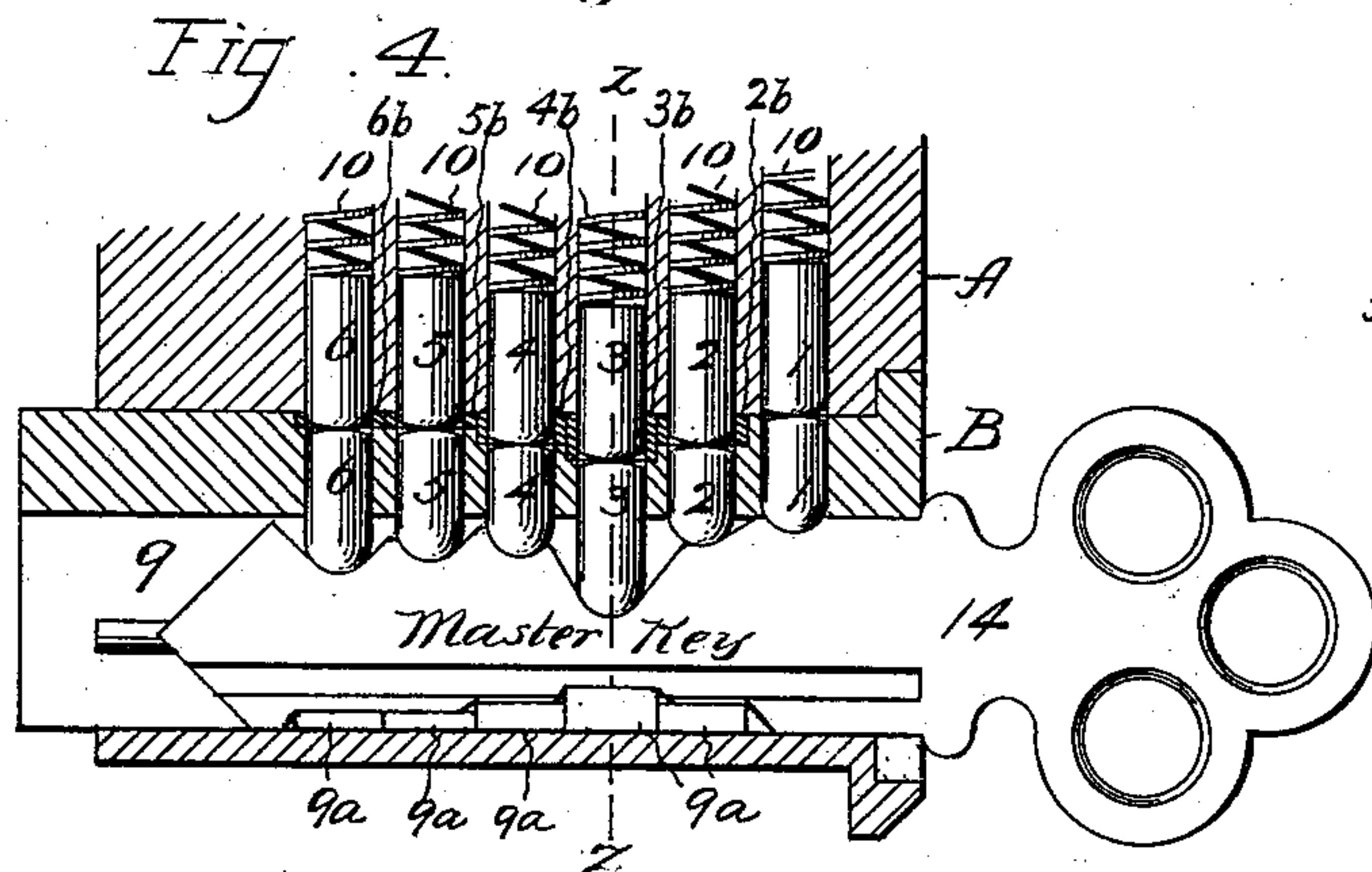
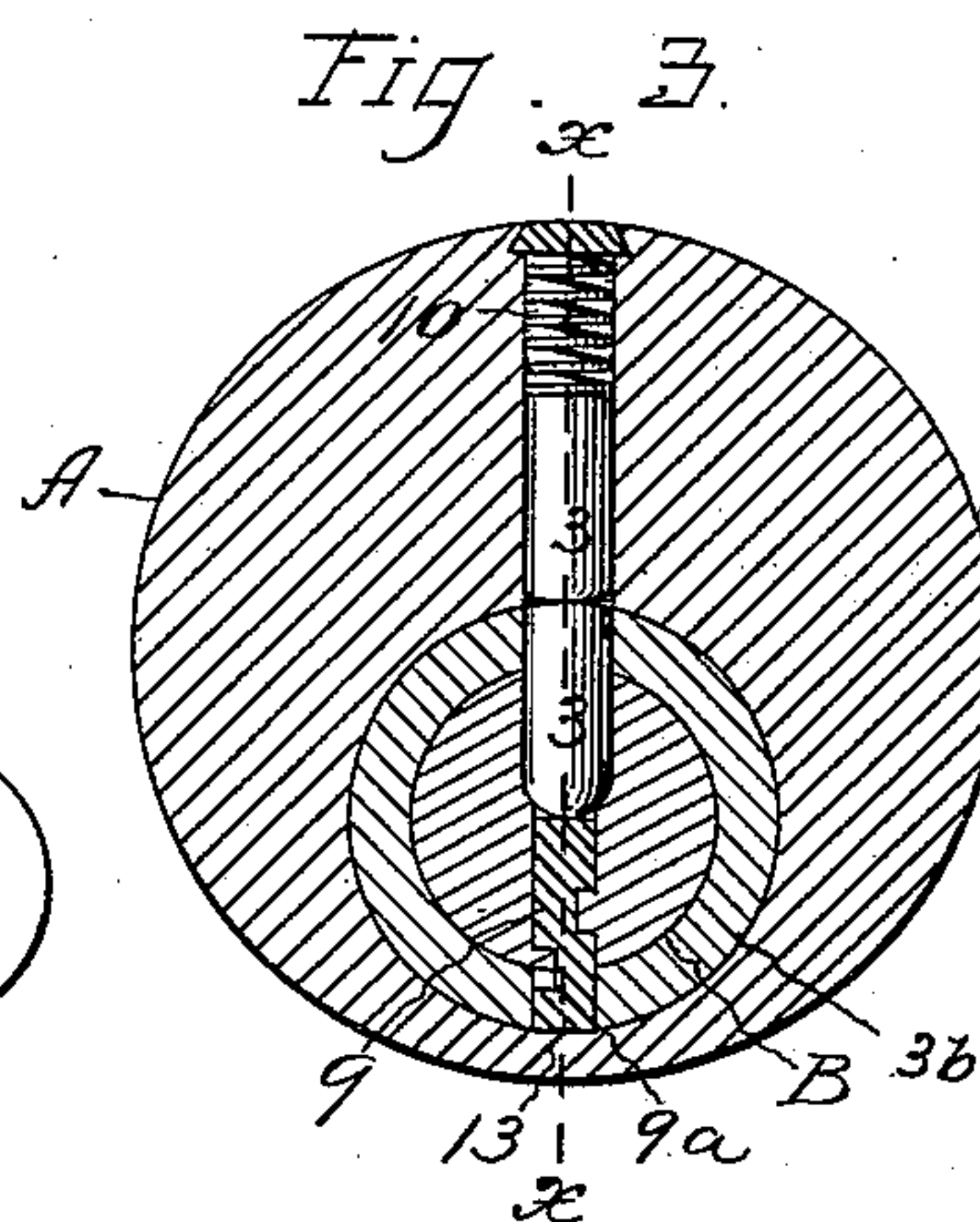
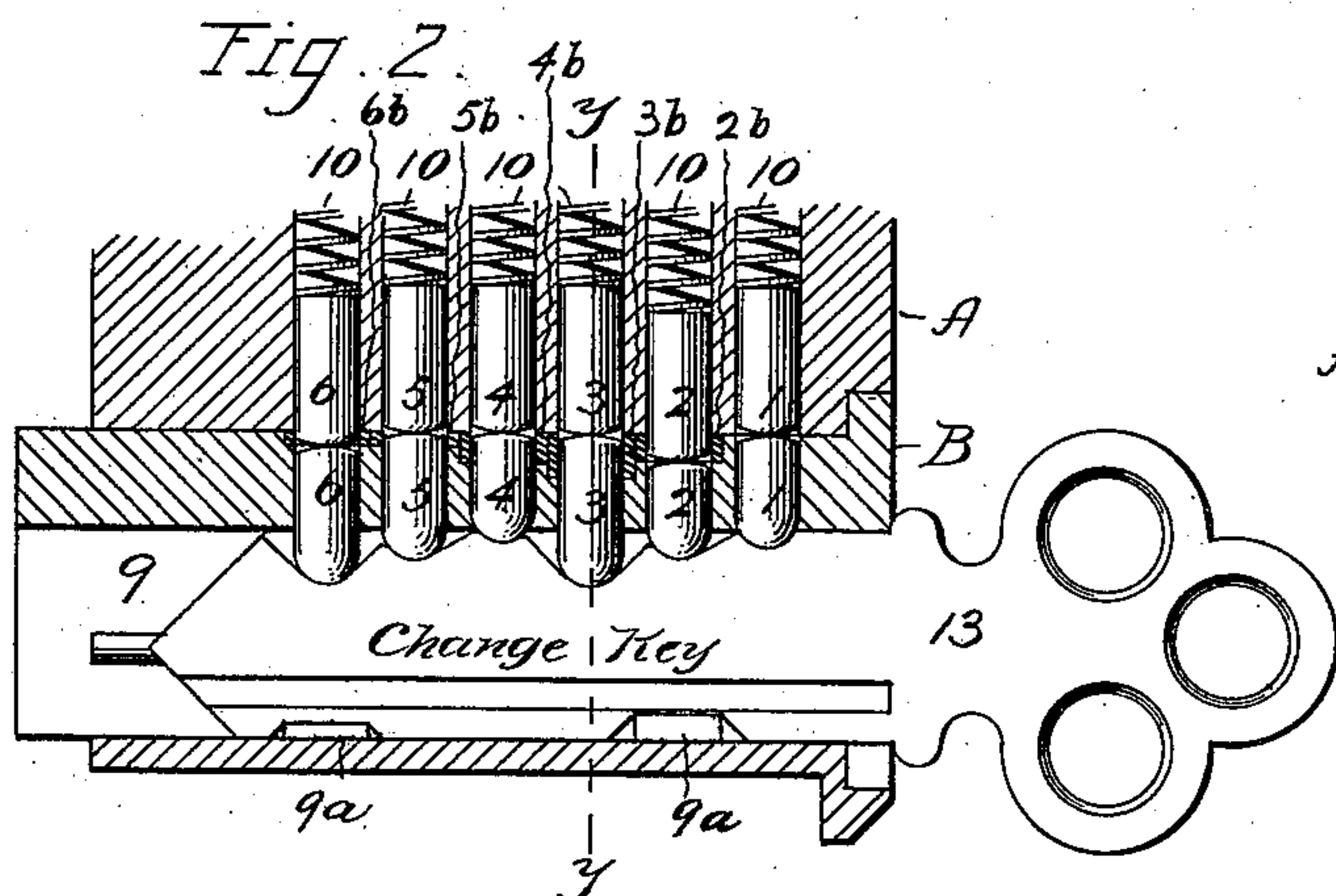
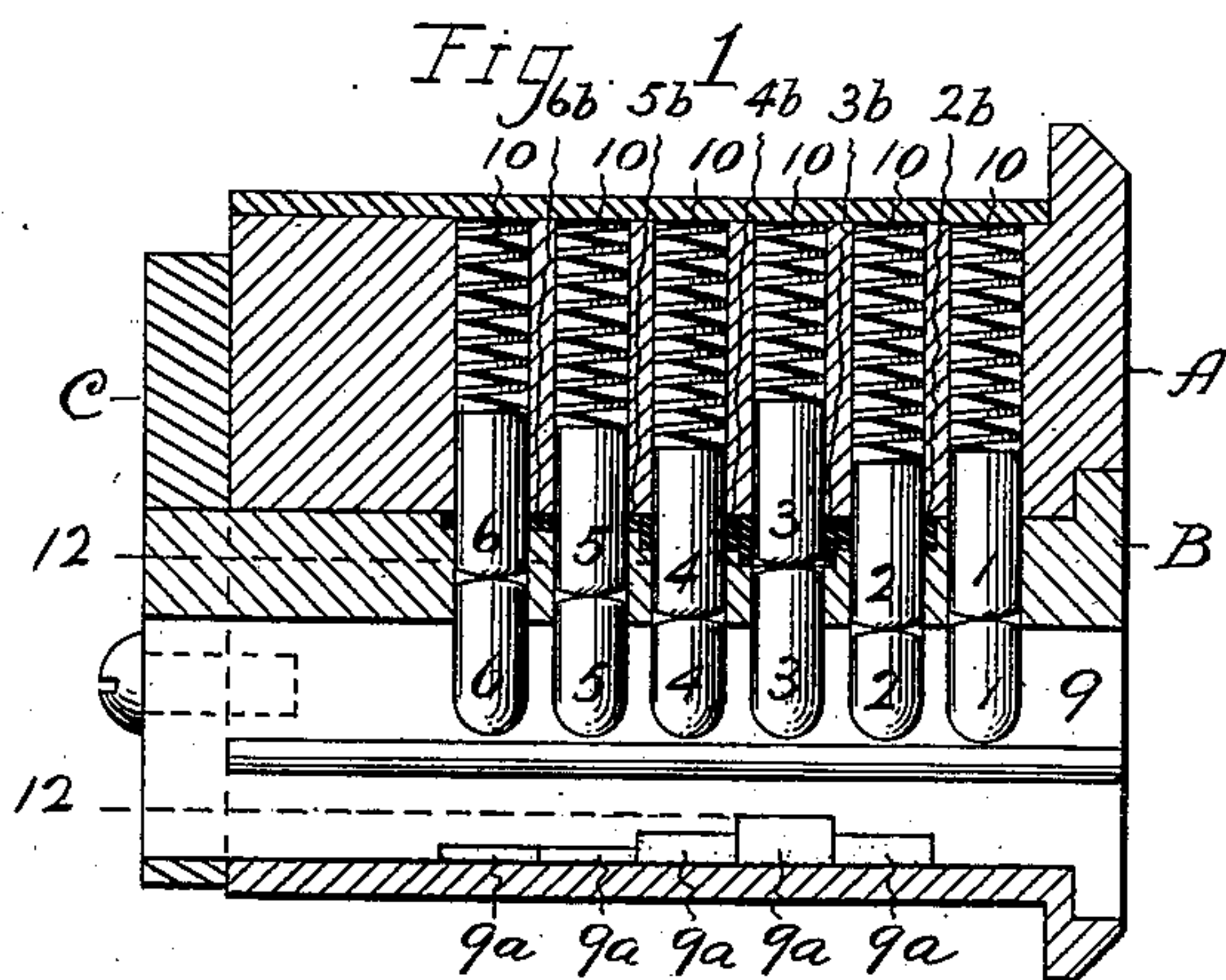
(No Model.)

2 Sheets—Sheet 1.

H. G. VOIGHT.
GRAND MASTER KEY CYLINDER LOCK.

No. 591,439.

Patented Oct. 12, 1897.



Witnesses

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(No Model.)

2 Sheets—Sheet 2.

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Fig. 6

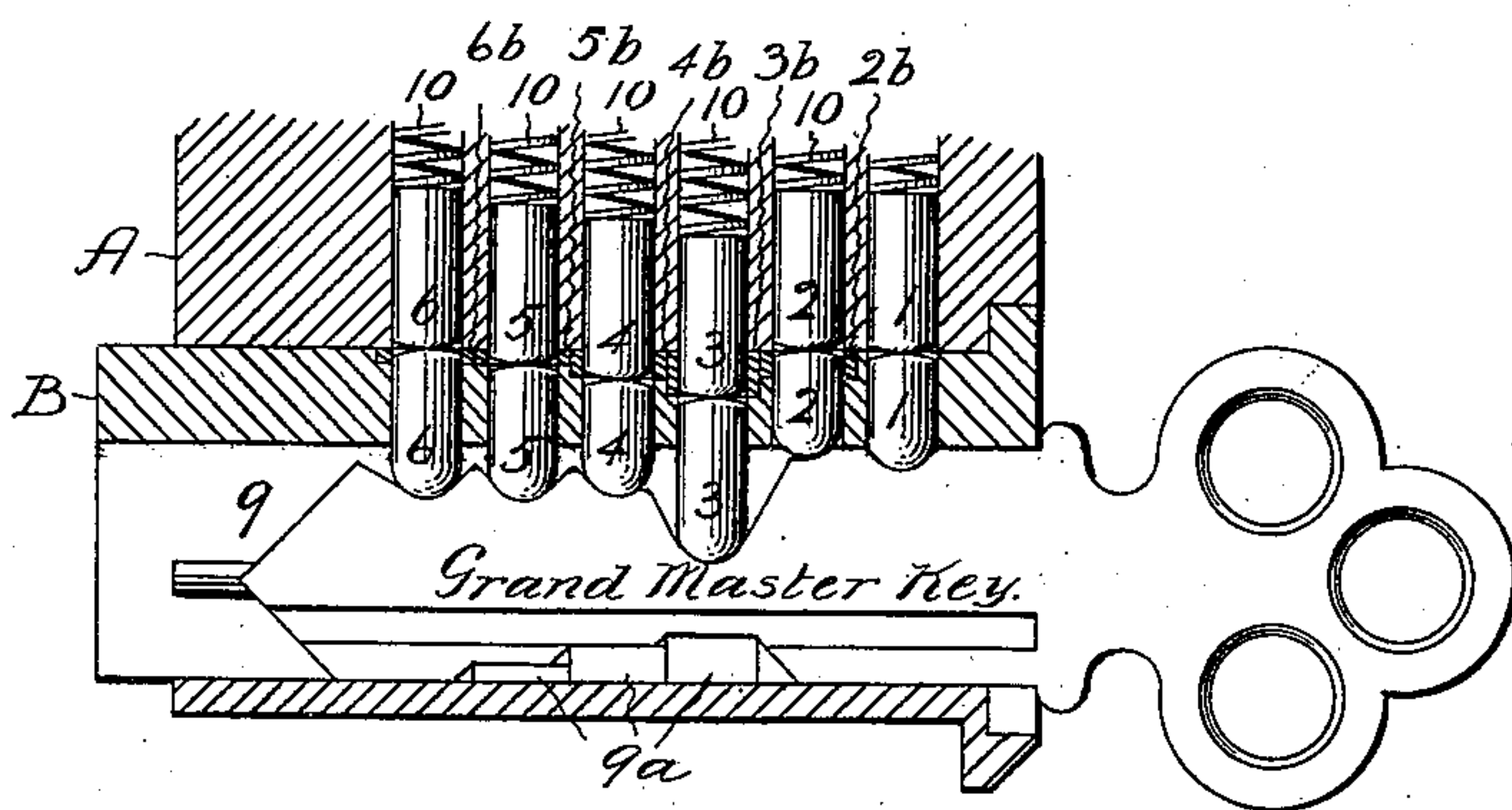


Fig. 7

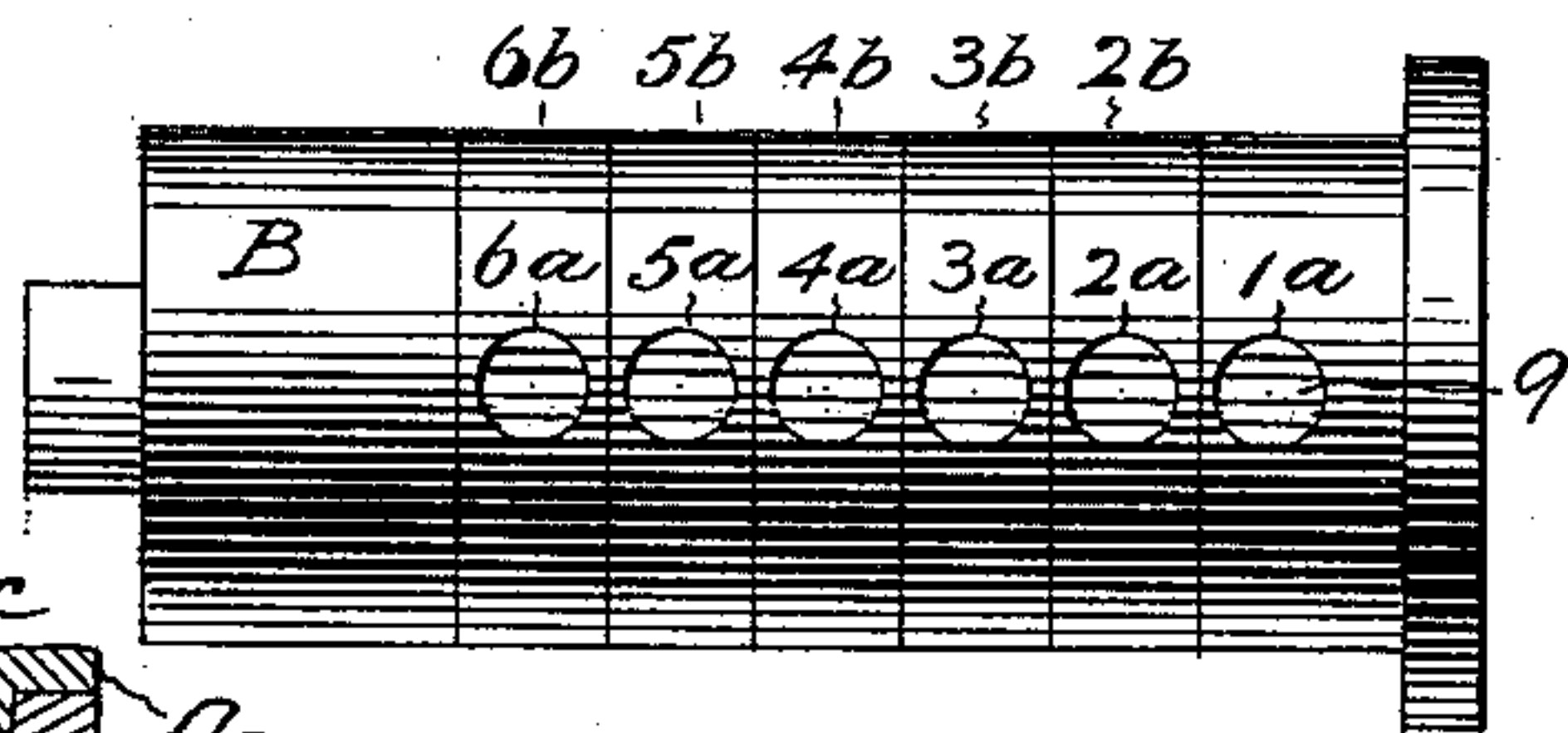


Fig. 9

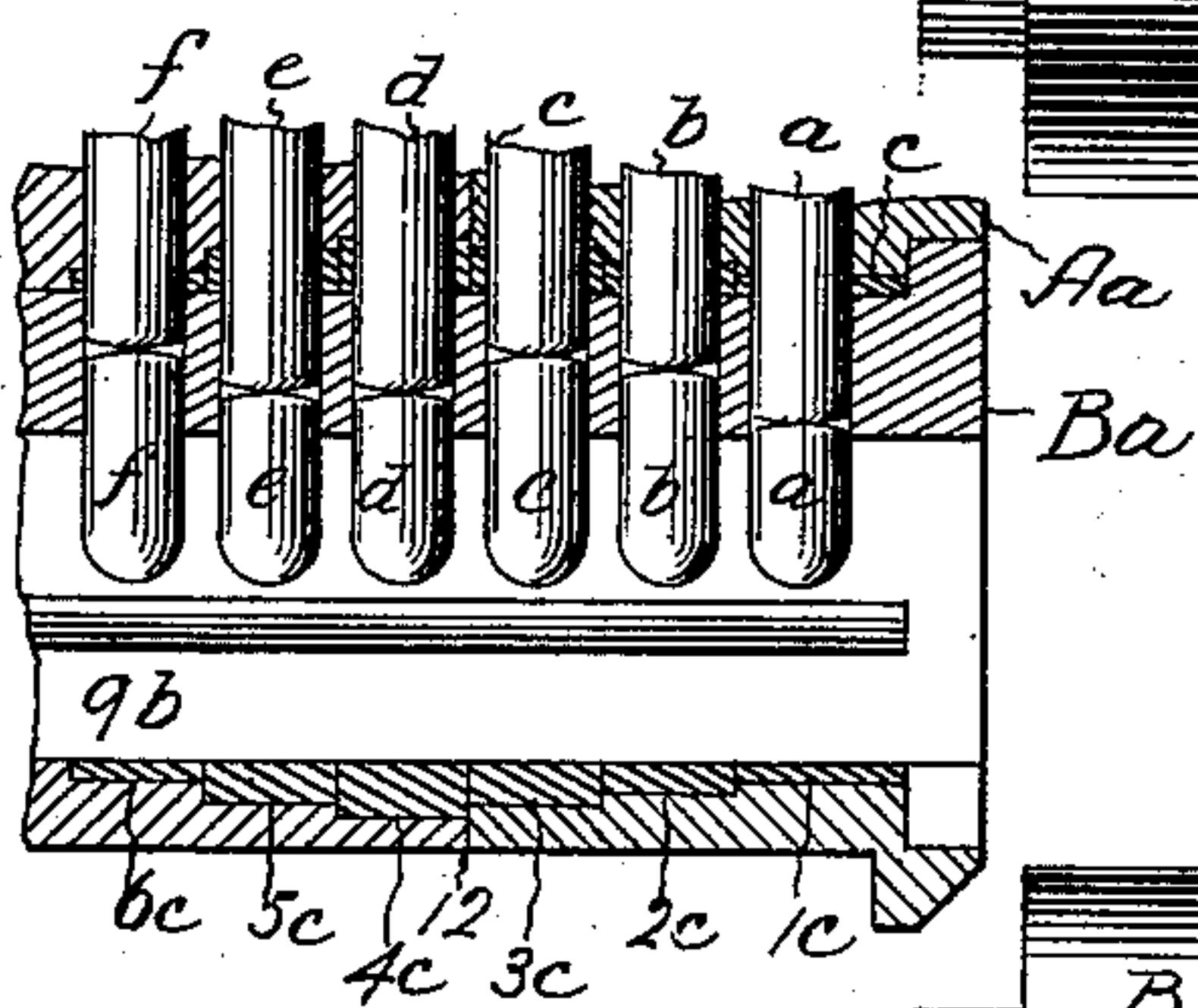


Fig. 8

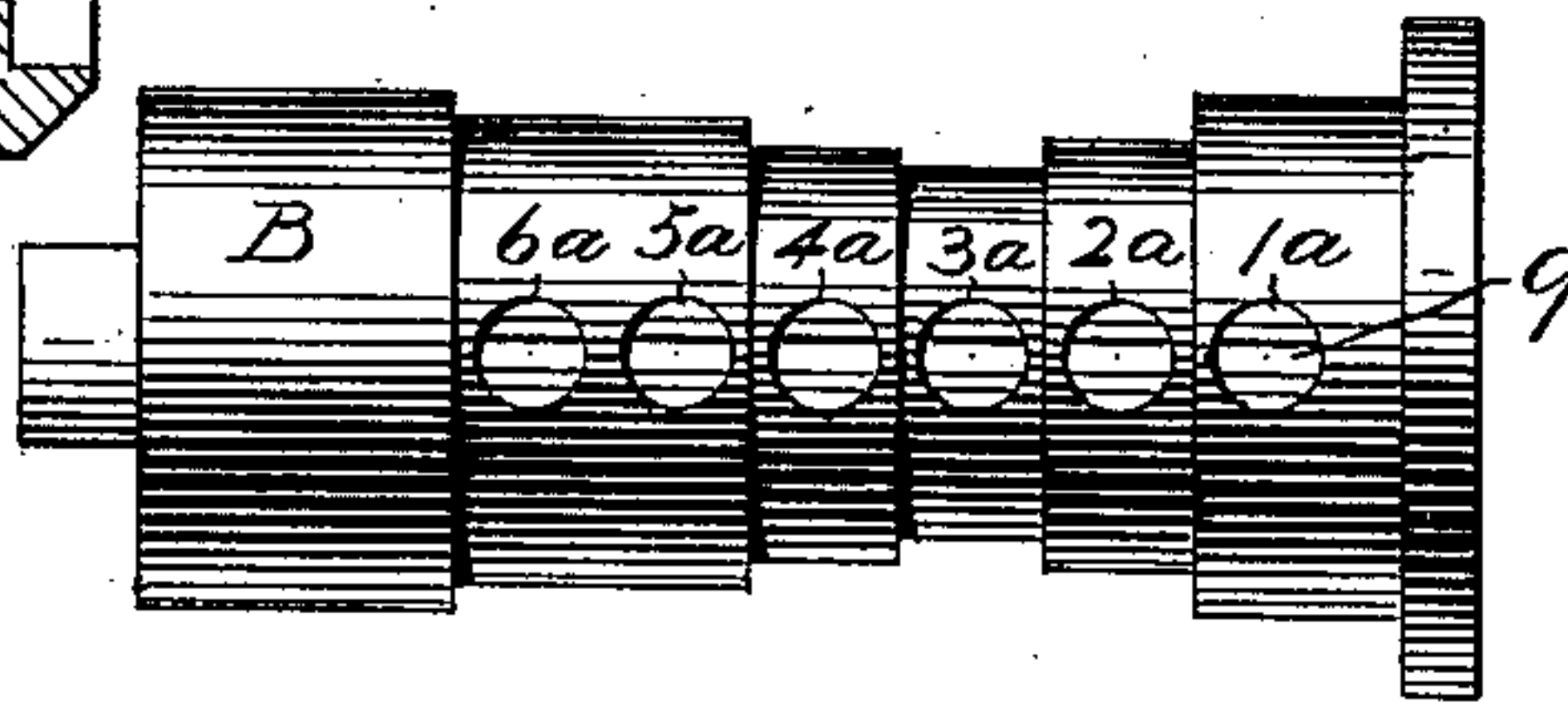
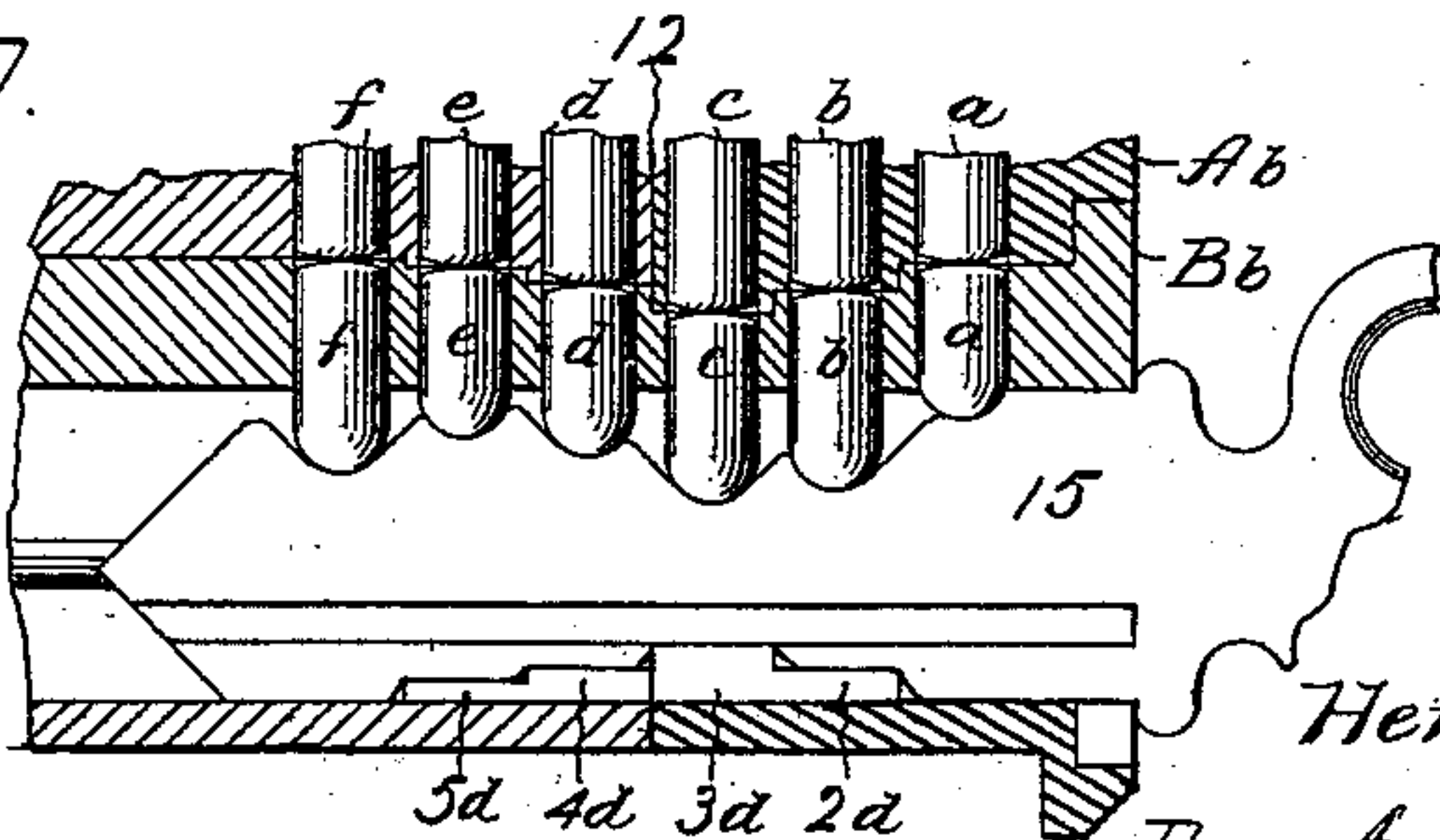


Fig. 10



WITNESSES

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UNITED STATES PATENT OFFICE,

HENRY G. VOIGHT, OF NEW BRITAIN, CONNECTICUT, ASSIGNOR TO THE
RUSSELL & ERWIN MANUFACTURING COMPANY, OF SAME PLACE.

GRAND-MASTER-KEY CYLINDER-LOCK.

SPECIFICATION forming part of Letters Patent No. 591,439, dated October 12, 1897.

Application filed March 25, 1897. Serial No. 629,174. (No model.)

To all whom it may concern:

Be it known that I, HENRY G. VOIGHT, a citizen of the United States, residing at New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Grand-Master-Key Cylinder-Locks, of which the following is a specification.

My invention relates to improvements in cylinder-locks; and the objects of my invention are simplicity and economy in construction and convenience and efficiency in operation.

In the accompanying drawings, Figure 1 is a central longitudinal section of my lock, partly in elevation, the plane of section being indicated by the line *x x* of Fig. 3. Fig. 2 is a like view of the main portion of the same with the change-key inserted ready to rotate the plug. Fig. 3 is a transverse section thereof on the line *y y* of Fig. 2. Fig. 4 is a view corresponding with Fig. 2, but with a master-key inserted instead of the change-key. Fig. 5 is a transverse section on the line *z z* of Fig. 4. Fig. 6 is a view corresponding with Figs. 2 and 4, but with the grand-master key inserted in the lock. Fig. 7 is a plan view of the complete cylinder or plug. Fig. 8 is a detached plan view of the plug with its rings removed; and Figs. 9 and 10 are central longitudinal sections, partly in elevation, of the principal parts of my lock, showing other modifications.

The case A, the general form of the plug B, and the wing or bit C on the rear end of the plug may be of any ordinary construction. The said bit is omitted from all the views except Fig. 1. The plug is provided with the ordinary keyway 9 and ordinary tumbler-recesses extending into said keyway, while the case A also has the ordinary series of tumbler-recesses, the case and plug having ordinary tumblers 1 2 3 4 5 6, in any desired number, together with the usual springs 10. In order to avoid confusion, no reference-numeral is given to designate the tumbler-recesses when a tumbler is shown therein, but in Figs. 7 and 8 the said recesses are designated 1^a, 2^a, 3^a, 4^a, 5^a, and 6^a, the numbers in each case corresponding with the number of tumbler belonging to the respective recesses.

The plug B is solid or full-sized at the tumbler-recess 1^a, and therefore the dividing-line of the tumblers 1 must always come on the periphery of the complete plug. The body of the plug is reduced in diameter at all of the other tumbler-recesses, and upon said reduced portions I secure as many separate rings as there are tumbler-recesses, said rings being designated as 2^b, 3^b, 4^b, 5^b, and 6^b, the numbers corresponding with the numbers of the respective tumblers that act in connection with said rings. Each ring is provided on one side with a tumbler-recess that registers correctly with the tumbler-recesses of the plug and case, (when brought into the proper position,) and the side diametrically opposite said tumbler-recess is slotted, as at 9^a, Figs. 3 and 5, to correspond with keyway 9 of the plug.

The plug may be made in one solid piece, as shown in Fig. 8, and the rings bent around the same and swaged or otherwise set in position thereon, or, if desired, the plug may be made in two parts, a core and a shell, the core being a cylinder of the same diameter as the plug at the deepest groove, as indicated by the broken lines 12, Fig. 1, and the outer shell or portion of the plug outside of said lines may be securely fixed in place by solder, pins, or otherwise, so that the completed plug is of the form illustrated, the several rings being slipped over the ends of said two parts of the plug before they are put together.

As shown, the tumbler 1 is the same in all the locks and for all of the keys, and the change-key 13 brings the ends of the tumblers 1, 3, 4, and 5 to the outside of the plug and its rings and the tumblers 2 and 6 to the inside of the corresponding rings. The master-key 14 brings the ends of the tumblers 1 to the outside of the plug and all of the other tumblers to the inside of the rings, the rings remaining stationary while the key and plug rotate. The keys must be slotted on the back to correspond with the rings, which serve as circular wards when thus held against rotation by the case-tumblers. The grand-master key, Fig. 6, brings the ends of the tumblers 1, 2, and 6 to the outside of the plug, while the tumblers 3, 4, and 5 come to the inside of their respective rings.

In order to make changes for a series of one hundred locks, use the tumblers 1, 3, 4, and 5 for change-keys, 1, 2, and 6 for master-keys working to inside of rings, and tumblers 1, 2, and 6 for grand-master keys working to the outside of rings. Change the length of one tumbler of 3, 4, and 5 in every ten locks with a corresponding change in thickness of its ring, while 1, 2, and 6 are alike. Then change the ring 2 or 6 and repeat same changes as in the first ten locks. Then change same ring again and repeat for every succeeding ten locks. The tumblers 3, 4, and 5 vary in length and the rings on the plug correspondingly vary in thickness. The tumblers 2 and 6 are of the same length in the whole series of locks. For changes of the master-key change the thickness of one ring for every ten locks. The tumblers 2 and 6 are carried by the master-key to the inner side of the rings and by the grand-master key to the outer side of the rings.

The foregoing is only an illustration of the changes that may be made with my lock, and it is obvious that other changes may be made and that the number of tumblers may be greater or less, as may be desired.

In Fig. 9 I have shown a lock of the same general character as that hereinbefore described, but instead of peripherally grooving the cylinder or plug B^a its body is made perfectly straight or cylindrical and the rings 1^c, 2^c, 3^c, 4^c, 5^c, and 6^c for the respective tumblers a b c d e f are placed on the said cylindrical body, projecting more or less therefrom as they vary in thickness. In order to properly fit them to the case A^a , the said case is divided transversely into two parts, as on the line 12, said parts being counterbored to fit the rings, and after placing the rings therein said parts are secured together in any proper manner, as by soldering or by screws. The body of the cylinder or plug is slotted to its periphery to form the keyway 9^b, and the several rings are not slotted at all, whereby the keyway is wholly inside of the rings.

The general operation of the lock and the manner of making the changes therein are the same as hereinbefore described, with the single exception already noted that the key does not pass through the slots in the rings, whereby the rings do not serve as wards for the key, as they do in the construction first described.

The advantage of a grooved cylinder or plug for the purpose of fitting it to circular wards for the key may be attained by the modified construction illustrated in Fig. 10, which, in common with the construction first described, has a grooved cylinder or plug with a keyway cut through all of the grooves, which grooves are filled by circular wards slotted in line with the keyway, and the key for which is notched on its back to conform to said wards. In the construction shown in Fig. 10 the slotted wards 2^d, 3^d, 4^d, and 5^d are formed integral—that is, solid with the case

A^b —and fill the corresponding grooves of the plug B^b , the case being divided transversely on the line 12, the same as in the construction shown in Fig. 9. The key 15 is also correspondingly notched at the back, as shown. The tumblers a b c d e f will always divide on the line of junction of the case and the bottoms of the grooves in the plug or cylinder. In the construction first described the wards or rings become, for the time being, a part of the case when their line of division comes at the bottom of the grooves in the plug, the case-tumblers then locking the wards or rings to the case, as before described.

I have shown a plurality of the rings and also of the grooves and surrounding wards, but it is evident that some of the objects of my invention may be attained when only one ring or one groove and one ward are employed. I reserve the right to make such changes in construction as are fairly within the spirit and scope of my invention.

I claim as my invention—

1. In a cylinder-lock, the combination of a plug provided with a reduced portion, a ring mounted thereon, the plug and case tumblers, said tumblers bearing directly against each other, said ring having a tumbler-recess that registers with the recesses and tumblers of the case and plug whereby the division of the said plug and case tumblers may be on the outer or inner side of said ring, substantially as described.

2. A cylinder-lock having case and plug tumblers acting against each other, a plug provided with a plurality of reduced portions and separate rings mounted thereon, said rings having tumbler-recesses that register with the tumbler-recesses and tumblers of the case and plug whereby the division of the tumblers may be on the outer or inner side of said rings, substantially as described.

3. The combination of the case having tumblers, the plug arranged to rotate in said case and also having tumblers adapted to engage directly with the tumblers of the case, separate rings mounted on said plug and having tumbler-recesses whereby the division of the case and plug tumblers may be in part at the outer side of said rings and in part at the inner side of said rings, substantially as described.

4. A lock having case and plug tumblers, the cylinder or plug of which lock has peripheral reduced portions of varying depths and rings thereon which correspondingly vary in thickness, substantially as described.

5. A lock, the cylinder or plug of which is provided with a reduced portion or groove, and a circular and slotted ward surrounding said reduced portion, the slot in which constitutes a portion of the keyway, substantially as described.

6. A cylinder-lock, the cylinder or plug of which has at each end a bearing in the case and a reduced portion or groove surrounding its periphery at one of its tumbler-recesses

between said end bearings, substantially as described.

7. A cylinder-lock, the cylinder or plug of which has a reduced portion or groove surrounding its periphery at one of its tumbler-recesses, and a slotted ring loosely mounted thereon and means for locking said ring against rotation to make it to serve as a ward for the key, as described.

10 8. In a cylinder-lock, the combination of the cylinder with wards that substantially

surround the said cylinder but which are slotted in alinement with the keyway of said cylinder when in its locked position, and a key bitted on one edge for acting in connection with the tumblers and having notches on its opposite edge to correspond with the wards of the lock, substantially as described.

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Witnesses:

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