

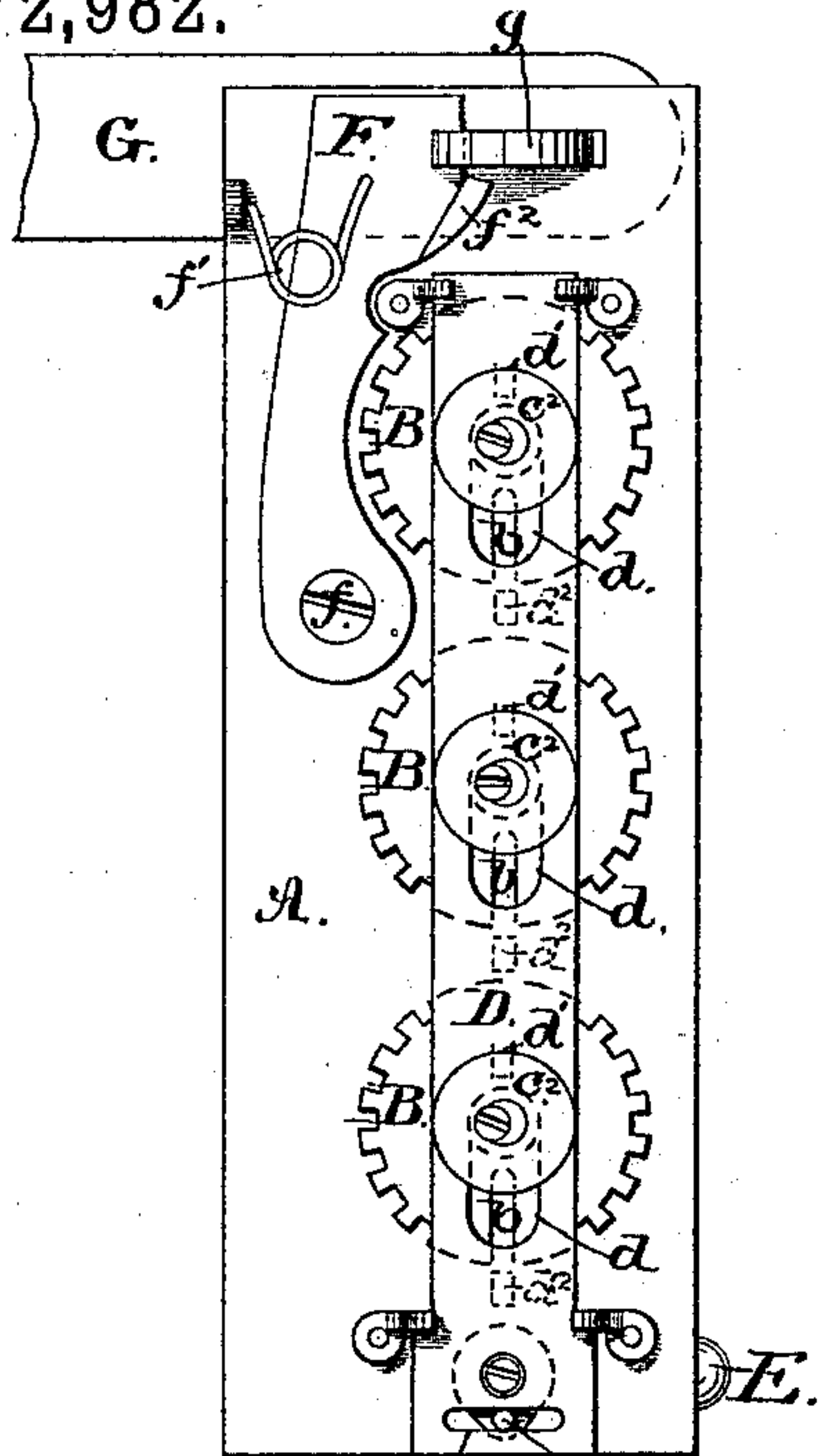
(Model.)

J. W. SCHOONMAKER.

PERMUTATION LOCK.

No. 272,982.

Patented Feb. 27, 1883.



d FIG. 2. *e*.

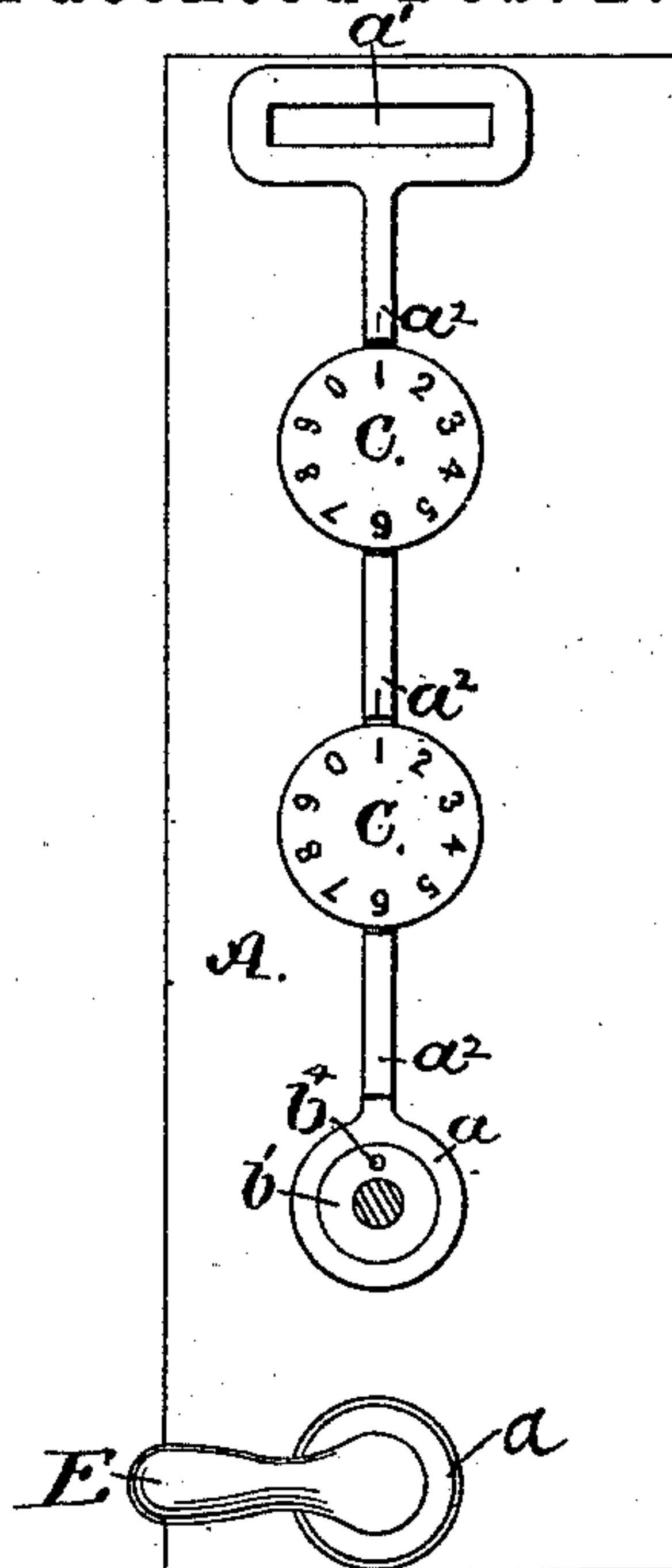


FIG. 1.

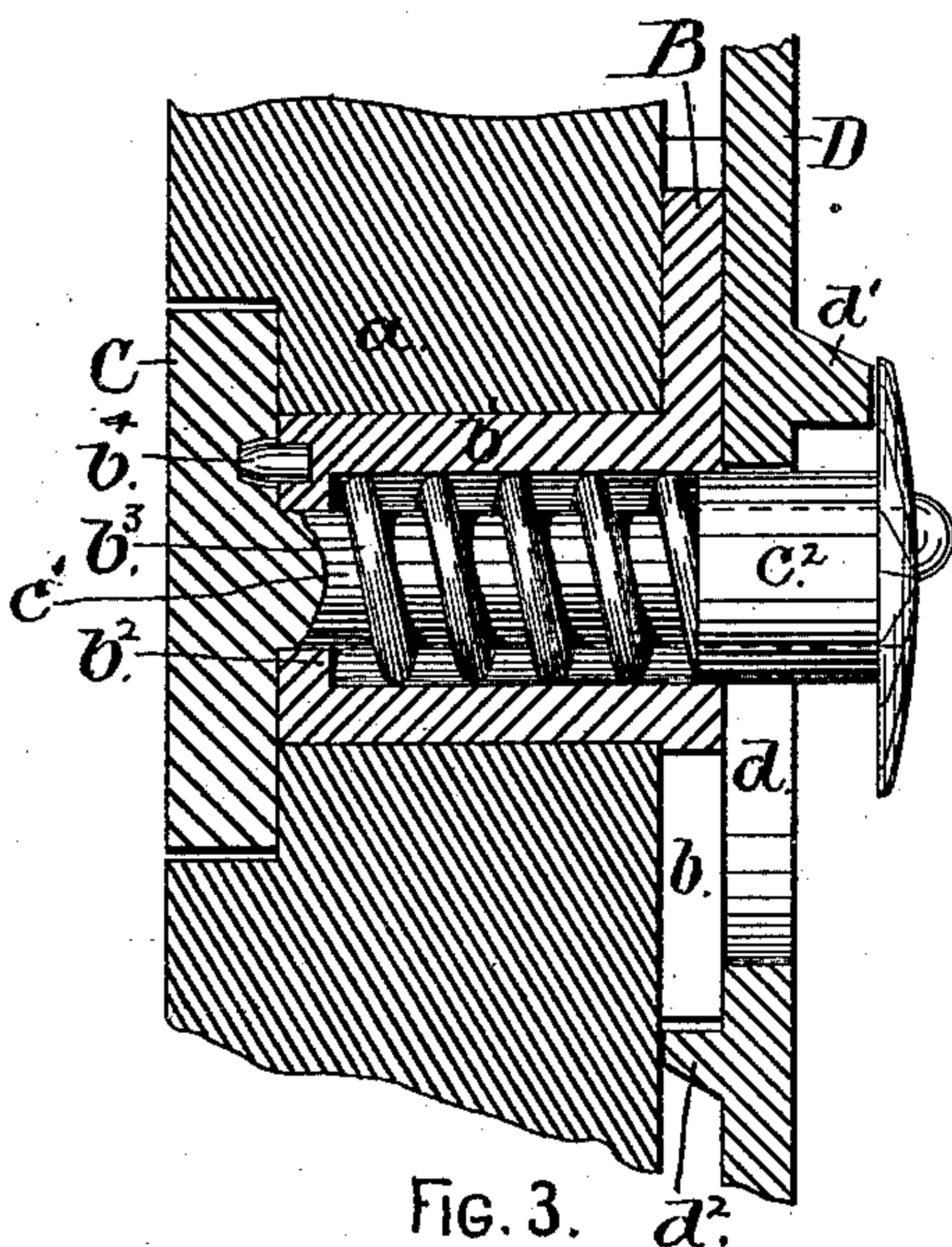


FIG. 3. a^2 .

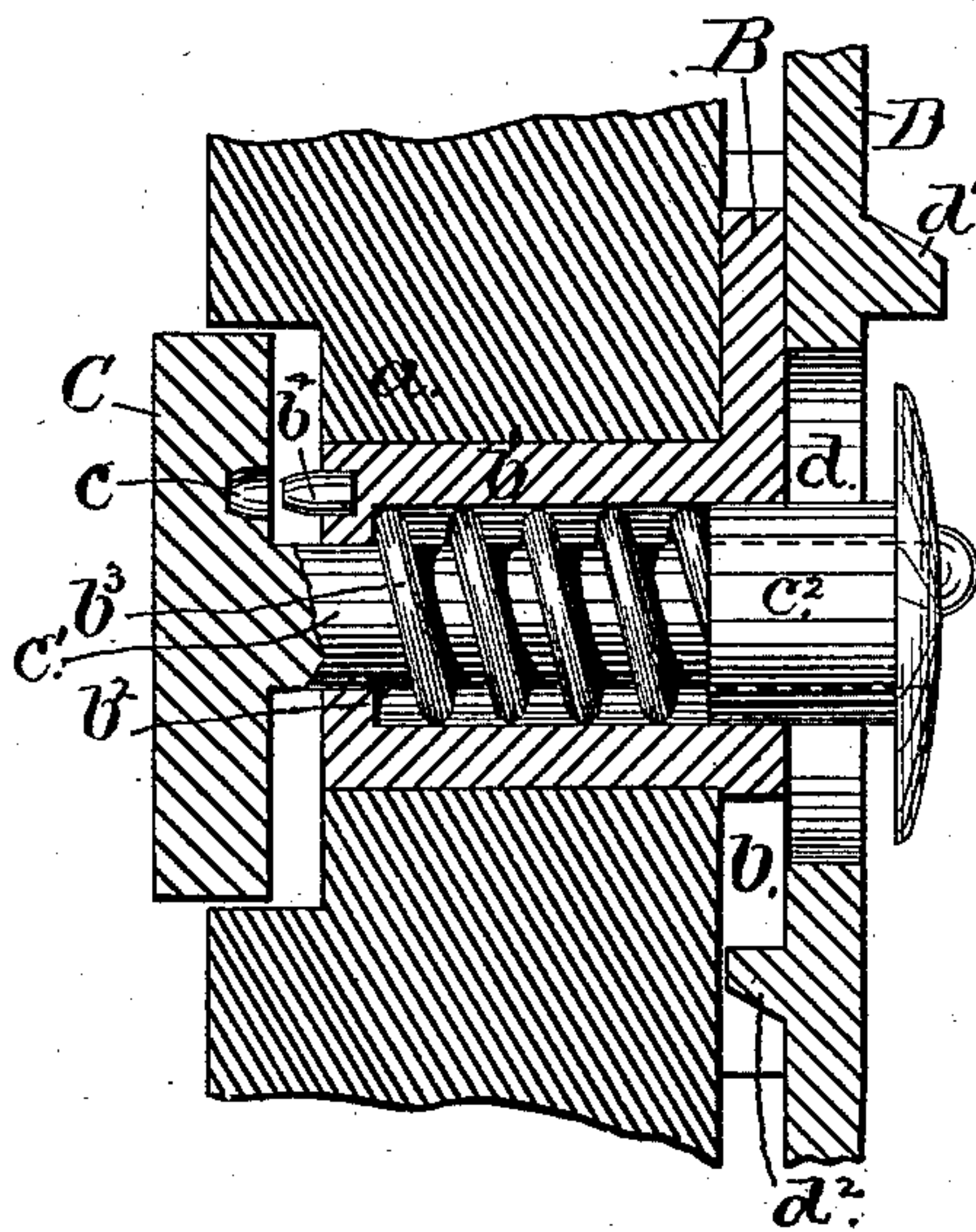


FIG. 4.

WITNESSES
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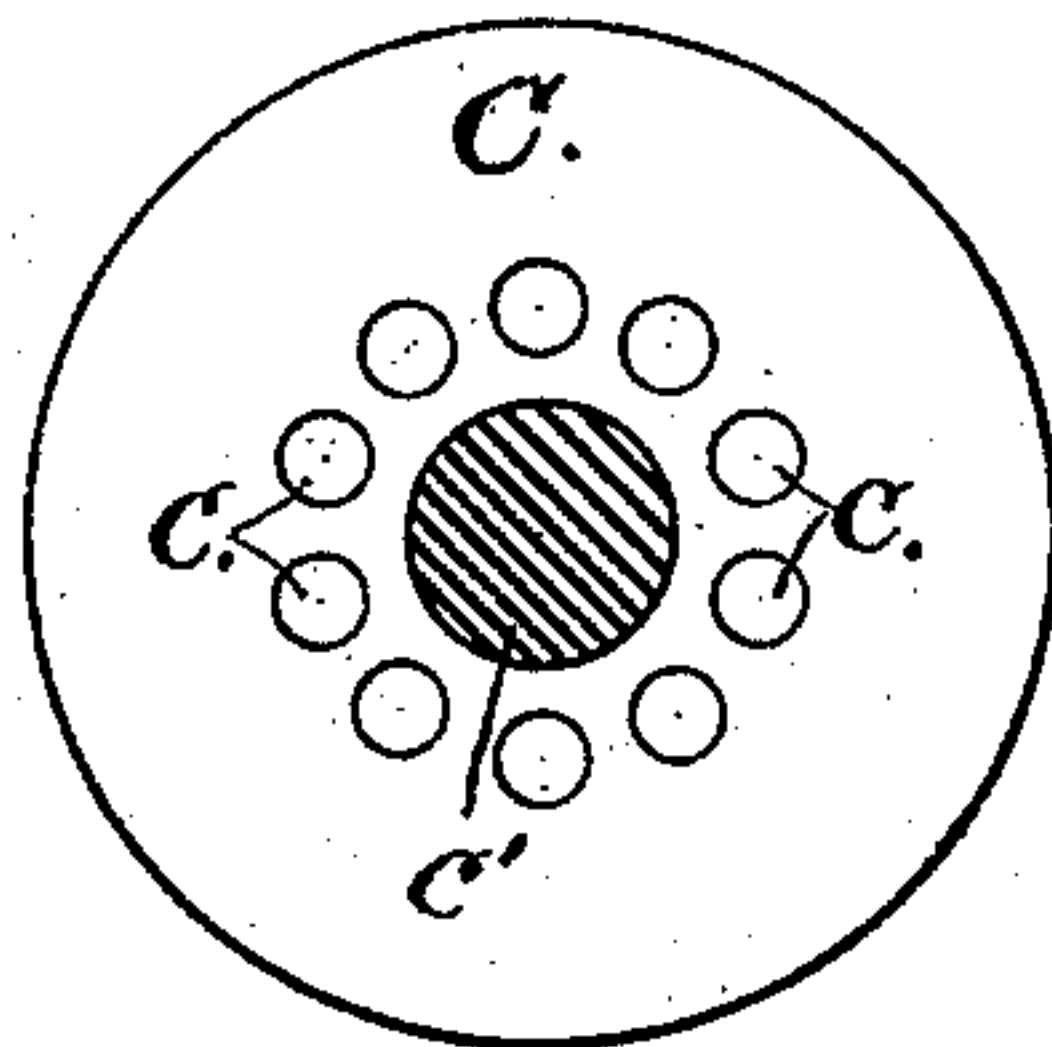


FIG. 5.

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UNITED STATES PATENT OFFICE.

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PERMUTATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 272,982, dated February 27, 1883.

Application filed February 4, 1882. (Model.)

To all whom it may concern:

Be it known that I, JAMES W. SCHOONMAKER, of the city and county of Albany, and State of New York, have invented certain new and useful Improvements in Locks, of which the following is a full and exact description.

My invention relates to improvements in that class of mechanisms that is generally known as the "combination-lock," in which class of devices, after the parts are adjusted to any contained combination of figures, letters, or other indexical characters, and are interlocked to prevent the retraction of the bolt, the lock can only be opened by restoring the parts to the same combination; and the objects of my improvements are to produce a cheap, simple, and reliable lock, wherein all the changes of the combinations may be effected entirely from and on the outside of the lock, and in any condition of light and darkness. I attain these objects by means of the mechanism illustrated in the accompanying drawings, which form part of this specification, and in which—

Figure 1 is a front elevation of a lock containing my improvements, and having one of the dials removed therefrom to show the underlying parts; Fig. 2, a rear elevation of the same; Fig. 3, an enlarged and detached vertical section through one of the guard-disks, dial, and part of the sliding plate, showing the position of said parts while the device is in its locked condition; Fig. 4, the same with the parts arranged in position for changing the combination; and Fig. 5 is a plan view of one of the operating-dials, transversely sectioned through its stem.

As illustrated in the drawings, A indicates the lock plate or case for containing the several parts of my mechanism; B, the guard-disks; C, the operating-dials; D, the sliding plate; E, the handle for working the sliding plate; F, the spring-latch, and G the hasp.

The plate A is provided on its exterior face with a series of bosses, *a*, one for each of the sleeves of the guard disks B and one for the stem of the handle E, and with a mortise, *a'*, through which the catch-piece of the hasp G enters the lock, as hereinafter described.

The periphery of each of the guard-disks B is cut or indented to form gear-like teeth

thereon, and in each one of said disks one of the spaces between the teeth is deepened to form a radial slot, *b*, for the purpose hereinafter set forth. Each of said disks is also provided with a hollow sleeve, *b'*, that extends outward through its appropriate boss, *a*, and is furnished with an inwardly-projecting shoulder, *b²*, that serves as a seat for receiving the pressure of a coiled spring, *b³*, which is contained in said sleeve. A stud, *b⁴*, is fixed in the outer end of the sleeve *b'*, to engage in holes formed in the under side of the operating-dials.

The outer face of each of the operating-dials C is furnished with a series of figures, letters, or any other preferred indexical characters, indentations, points, or projections, and on the under side of each of said dials there is a concentric row of holes, *c*, adapted to fit onto the studs *b⁴*, and corresponding in numbers and positions to the indexical numbers, letters, &c., on the face of the dial. A stem, *c'*, is formed on the under side of each dial to extend through the sleeve of its connected guard-disk, as shown in Figs. 3 and 4, and on its inner end the said stem is fitted with a flanged collar, *c²*, that is secured thereto, and is adapted to receive the pressure from the inner end of the spring *b³*, for the purpose of forcing the stud *b⁴* to engage into any one of the holes *c* to which at the time it may be adjusted; and it must be understood that by means of the studs *b⁴* and the holes *c* each of the guard-disks B and its corresponding dial, C, can be adjustably connected together, so as to be moved as one piece.

The sliding plate D is interposed between the inner faces of the guard-disks B and the flanges of the collars *c²*, and it is provided with a series of holes, *d*, through which the sleeves of the collars *c²* pass. Said sliding plate is also provided on its inner face with a series of stops or projections, *d'*, (one for each of the collars *c²*,) which, when the device is locked, engage under the flanges of the collars *c²*, to prevent the dials C from being drawn outward to effect any change of the combination. On the opposite side of said sliding plate there is a series of short longitudinal ribs, *d²*, which, until the guard-disks are brought around to the required positions for opening

the lock, strike against the periphery of the guard-disks and prevent the sliding plate from being moved to release the hold of the lock. Said ribs d^2 are also adapted to engage in slots b of the guard-disks when the slide-plate is moved to release the lock; and it will be observed that the stops d' and ribs d^2 are arranged in such relation to each other that when the stops d' are withdrawn from underneath the flanges of the collars c^2 the ribs d^2 are engaged in the slots b , and thus prevent the guard-disks B from turning while the changes in the combination are being made, and reciprocally when the ribs d^2 are moved out of the slots b , (thereby leaving the guard-disks B free to turn in either direction,) the stops or projections d' will be fixed in position beneath the flanges of the collars c^2 , to prevent the dials C from being drawn outward to effect any changes of the combination. The crank-pin e of the handle E engages in the slotted opening d^3 , and thus affords the means for moving the sliding plate D from the outside of the lock.

The spring-latch F is pivoted at f to the plate A, and is thrown forward by the spring f' , so as to engage in the catch-piece g of the hasp G. A cam-shaped projection, f^2 , is formed on the said spring-latch, and is adapted to receive the pressure of the sliding plate D when the latter is moved endwise in that direction, so as to swing back the spring-latch F against the resistance of the spring f' , and thereby release the hasp G from its engagement with the said spring-latch.

The mode of changing the combinations in the lock is as follows: The sliding plate D being moved forward to release the spring-latch F, as hereinabove described, the ribs d^2 will thereby be engaged in the slots b to hold the guard-disks B in their fixed positions, and the stops d' will be removed from under the flanges of the collars c^2 . Each dial C, or any of them, can be then drawn outward against the resistance of its spring b^3 until the stud b^4 of its connecting guard-disk is freed from the hole c , in which the said stud has theretofore been engaged. The dial may then be turned in either direction until the stud will engage in some other hole in the series in the under side of the dial, and then, upon releasing the dial, the resilient action of the spring b^3 will force a re-engagement of the dial with its corresponding guard-disk in the changed position of the dial, and this position will be indicated on the exterior of the lock by the indexical devices on the face of the dial, one of which indices will correspond with a fixed mark placed adjacent to each dial, and for this purpose I preferably fix such mark on the rib a^2 , formed on the outer face of the plate A; and it is obvious that when the lock is closed up, with the parts adjusted to any particular combination indicated by the indexical figures, characters, or other devices

on the faces of the dials, it can only be opened by restoring the dials to the same indicated positions, for the reason that until that act is accomplished the ribs d^2 cannot pass into the radial slots b of the guard-disks, and consequently the sliding plate D cannot be moved to effect the opening of the lock.

While my invention is herein shown and described as applied to a hasp-lock, it is evident that the same mode of changing the combinations may be readily applied to any other form of lock by simply making the sliding plate D control the movement of the sliding bolt, or by utilizing the sliding plate to serve as the sliding bolt of the lock, and it is also evident that, instead of the three guard-disks B and their coacting parts shown in the drawings, any other plural number of such parts may be employed in a lock without further invention. Therefore I do not confine myself to any particular style of lock, as the elements herein contained in the combinations set forth may be applied to any, all, and every kind and style of lock.

By substituting points, projections, or indentations of different shapes for the indexical letters, &c., on the faces of the dials C the lock may be manipulated in the dark entirely by the sense of feeling.

I claim as my invention—

1. A permutation-lock consisting of a holding plate or case, A, a series of dials arranged in line on the outside of said plate, a guard-disk connected to each of said dials, a radial slot in each of said guard-disks, and an independently-operated sliding plate having stops, as d' , adapted to operate in connection with a latch, F, substantially as described.

2. In a permutation-lock, the dials C, provided with an interior row of perforations, c , corresponding to a series of exterior symbols, in combination with a spindle, c' , having the spring, and the sleeve b' , having the shoulder b^2 , and also having the guard plate or disk B, attached to the end opposite that which contains the pin b^4 , all substantially as described.

3. The combination, in a lock, of the dials C, the guard-disks B, connected thereto, a sliding plate, D, having the ribs d^2 , and the spring b^3 , the parts being constructed and arranged so that the guard-plate may be held stationary while the disk is rotated, substantially as and for the purpose set forth.

4. In a lock, the combination of the dials C, the guard-disks B, the flanged spindles c' , and the sliding plate D, having the stops d' and ribs d^2 .

JAMES W. ^{his} × SCHOONMAKER.
mark.

Witnesses:

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WILLIAM H. LOW.