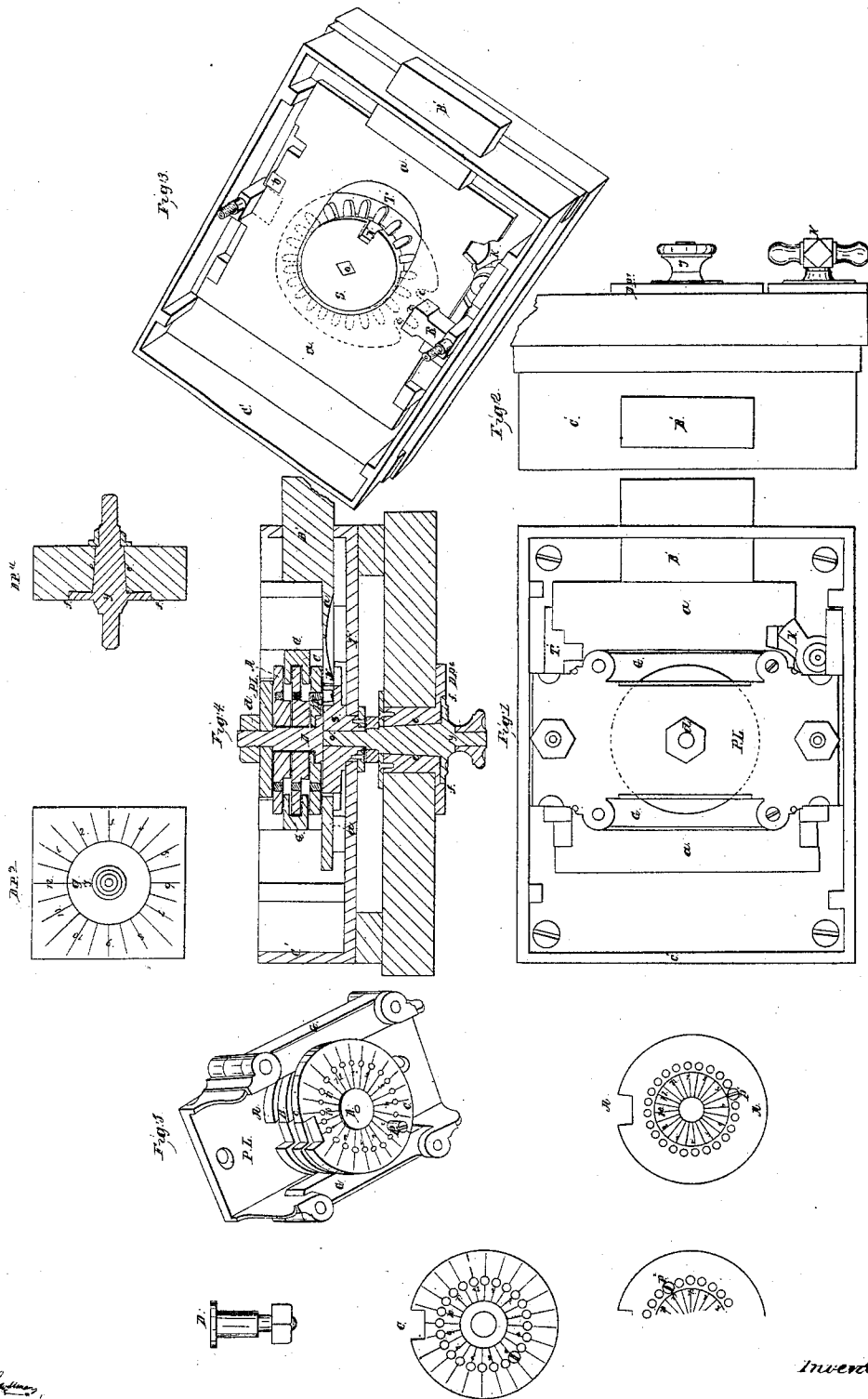


### *Permutation Lock.*

*N<sup>o</sup> 24,975.*

*Patented Aug. 2, 1859.*



*Witnesses:*  
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# UNITED STATES PATENT OFFICE.

WILLIAM JOHNSON, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO HIMSELF AND EIBERT SCHUMACHER, OF SAME PLACE.

## BANK-LOCK.

Specification of Letters Patent No. 24,975, dated August 2, 1859.

*To all whom it may concern:*

Be it known that I, WILLIAM JOHNSON, of the city of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Bank and other Locks; and I do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings and to the letters and marks thereon.

In constructing locks for bank vaults, safes, and other depositories of treasure and valuable papers, it has become necessary to make them very strong, inasmuch as burglars of late rely more upon forcing and breaking the lock than upon picking it. The more complicated locks are usually made up of many pieces, each piece necessarily being of itself weak and easily broken, and no matter how complicated a lock may be if it is made of several pieces it is easily forced or broken. Still to a considerable extent we must rely upon a certain amount of complication for security in locks; although all burglar-proof locks must have strength and solidity of structure as the great elements constituting their value. In my invention I have endeavored to combine with a limited amount of complicated arrangement, simplicity, and great strength; and in carrying out my invention I have adopted the class of locks wherein a certain number of disks or regulator wheels have to be placed in certain known positions in order that the tumblers may be moved and the bolt be allowed to be thrown.

In the drawings forming part of this specification (C') indicates the case of the lock; (B') the bolt; (T') the tumbler; (A, B, C) the disk, acting as guards or regulator wheels; (S) an operating disk or stop-cock wheel; (T) the stem of the indicator by which the cock wheel and guard disks are rotated; and (K) the key for moving the main bolt.

This lock has but one tumbler proper (T') which, as is shown by the drawings, is of great strength and will resist very considerable force whether applied by pressure or by a stroke or blow. It is placed between the shell or case-plate of the lock and the bolt-plate (a) and has the usual notches for the guiding studs, and has, also, a strong stump or stud (R) which fits into the recesses of the guard disks, and a smaller stud (b)

which fits into notches of the bolt-plate. It will be seen that the central portion of the tumbler is cut away leaving a nearly circular space for the stop-cock wheel (S) and there is projecting upward into this space three teeth or processes (c, c, c,) which must fit into the spaces between the teeth of the cock-wheel when the tumbler is raised up preparatory to the movement of the bolt. The stop-cock wheel (S) is a disk toothed entirely around its periphery and, by its attachment to the stem of the indicator, is made the operating disk to place the regulating wheels or guard plates in the proper position for the stump of the tumbler to enter the recesses in the guard plates that the tumbler may be elevated. A notch (N) in this disk receives the head of the screw-pin (p<sup>3</sup>) of guard plate (C), by which the disk and the guard plate are connected to each other. A square hole in the center of the disk (N) has fitted in it the end of the stem of the indicator by which it is rotated.

Figure 5 of the drawings shows three regulator wheels or guard plates (A, B, C) attached to their case (P, L). Although but three such wheels are here shown it is obvious that the number may be greater if desirable. A pin (D) the head of which is countersunk in plate (C) passes through the plates or wheels and through the plate of the case (P, L) where it is held by a nut (d). It will be seen that the plate (C) is held against the bars (G) of the case, that plate (B) fits into grooves in the bars (G, G) and that plate (A) has its traverse between the bars (G, G) and the plate of the case. This arrangement of these guard plates gives each of them very full and complete protection and very firm support. Each of these plates or wheels have a certain number of holes, twelve, as shown by the drawings but which can be of a greater or less number, and are provided each with a screw-pin the heads and points of which are the operating means of the one plate by the other, as will be noticed:—thus the head of pin (p<sup>3</sup>) fitting into the notch (N) of cock-wheel (S) and its point hitting against the head of pin (p<sup>2</sup>) and the point of pin (p<sup>2</sup>) hitting against the head of pin (p<sup>3</sup>) the rotation of the one plate or wheel carries with it the other plates or wheels and by the proper movements thereof the whole number of the plates are brought into the re-

quired position for allowing the movement of the tumbler. The amount or extent of this movement of the plates or wheels will depend upon the position of the pins, as will readily be perceived. These pins can easily be taken out of any one set of holes in the plates, as they are screw-pins, and be placed in other holes, thus allowing of changes in position and in the relation of the one pin to the other to a very great degree.

The position to which the plates or wheels (A, B, C) must be brought, when the pins are arranged and that arrangement noted, will be indicated by the dial plate upon the door, or properly in the door, as will now be named. By the figures of the drawings two modes are shown of affixing the dial to the door—Fig. 4 representing that now commonly practiced the dial plate being fitted upon the door, and figures (D, P<sup>3</sup>) and (D, P<sup>4</sup>) showing my improved mode the dial being made on the door. These figures are designed to represent so much of the door as is occupied by the dial, the figures and letters and lines, or whatever marks may be used to indicate, being cut or engraved in the door itself, no plate being used whatever. This entirely remedies a weakness which has always heretofore existed with burglar proof safes as when the dial is a plate fitted into or attached to the door the burglar by knocking or forcing it out or off made an opening which gave him easy access to the interior of the lock and safe. By making the indicating marks in the substance of the door, the opening for the stem being small, the interior of the lock can not be reached. And as a further means of guarding this point, it will be perceived, that I make the indicator stem tapering or conical (*e*) and bevel the periphery (*f*) of the extension piece of it which fits into the door while I also form this extension piece and the stem, in fact, the whole of the projecting or actuating stem of one solid piece of metal. The beveled edge of the extension piece and the tapering form of the stem both guard against their being driven inwardly and every blow upon them serves to make firmer in the hole and space of the door at and through which the burglar's efforts are directed. The figures and marks upon the dial corresponding with those of the plates, in order to adapt the one to the other it is only necessary to select the holes for the screw-pins and to note the relation that exists between the parts. As will be seen by referring to figure (D, P<sup>3</sup>) there is an indicating line (*g*) on the face of the stem's extension piece. Under the explanations of the construction of this lock here given its operation will now, readily, be understood.

As shown by the drawings pin (P') of plate or wheel (A) is in hole 3½, pin (P<sup>2</sup>)

of plate (B) is in hole 11, and pin (P<sup>3</sup>) of plate (C) is in hole 5. Now you first turn the indicator around from the right to the left three times stopping with the indicator line (*g*) at 3½, thus bringing the pins of the different plates properly into position. Having thus stopped at 3½ you reverse the motion turning from the left to the right one entire revolution and so much of another as will bring the line (*g*) to 11, and from that turn the indicator directly back to 5: these movements will place the recesses in the peripheries of the regulator wheels or plates over the stud or stump (R) of the tumbler, and the teeth (*c, c, c*) of the tumbler in line with the spaces between the teeth of the cock wheel (S) and by turning the key (K) the tumbler will be lifted and the bolt be given motion.

It will be noticed that without knowing the position of the pins in the plates no motion can be given the bolt, and that all the usual efforts made by lock pickers to ascertain the condition of the guard-plates and tumblers by thrust on the end of the bolt, will be resisted by the key (K) bearing against the recessed face of the lock plate, and by the stud (*b*) of the tumbler; these two resisting points being well arranged to sustain each other. It will, also, be noticed that the regulator wheels or guard plates are carefully and very completely protected by their case.

Having thus fully set out the construction and operation of my improvements what I claim as new and desire to secure by Letters Patent is—

1. Operating the regulator wheels or guard-plates by the screw-pins which are susceptible of being changed in the holes of the plates and in relation to each other as herein set forth.

2. I claim the tapered indicator's stem and beveled plate of the stem fitting into the tapered recesses as and for the purposes set forth.

3. In combination with a series of regulator wheels or guard plates operated as described, I claim the means for indicating the position of such plates constructed and arranged as set forth.

4. I claim the cock-wheel or toothed disk in combination with the tumbler and the regulator wheels or guard plates as described.

This specification signed at Milwaukee, Wisconsin this 25th day of June 1859.

WILLIAM JOHNSON.

Witnesses:

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