

No. 635,549.

Patented Oct. 24, 1899.

R. W. INGLIS.
PERMUTATION LOCK.

(Application filed Feb. 16, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

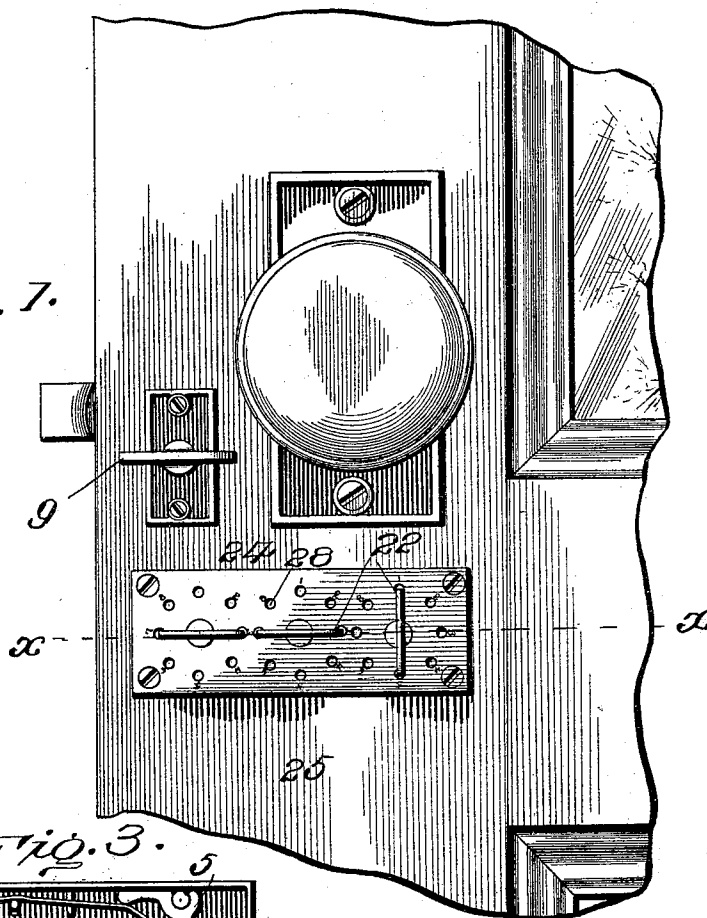


Fig. 3.

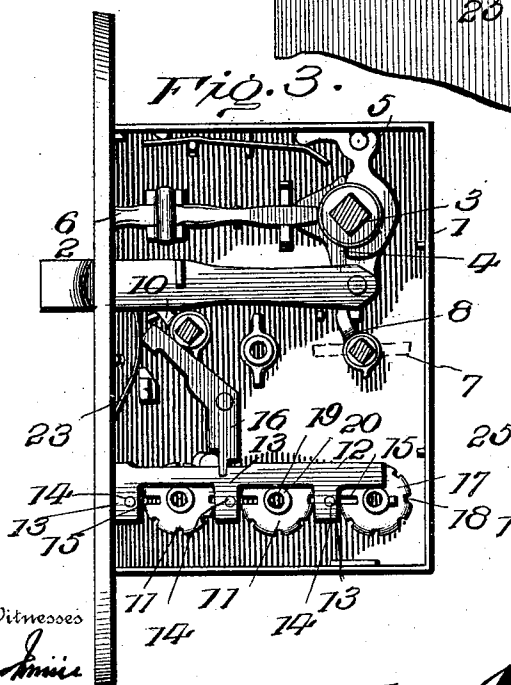
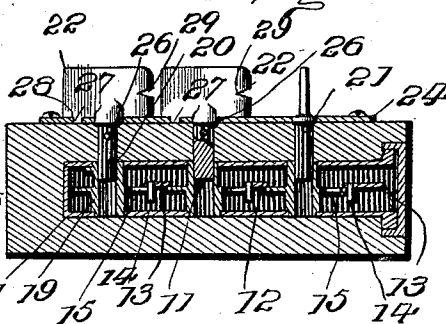


Fig. 2.



Witnesses

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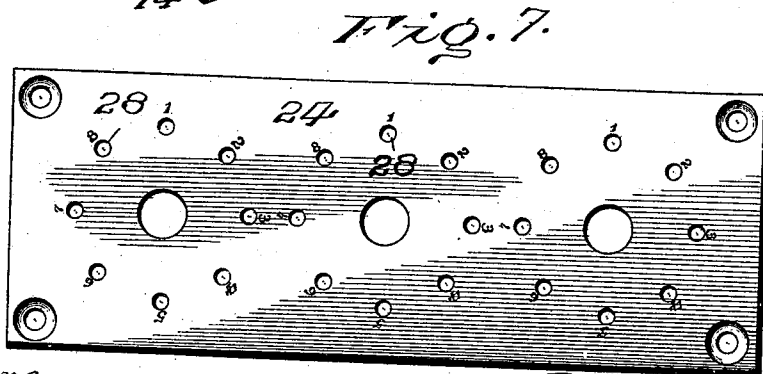
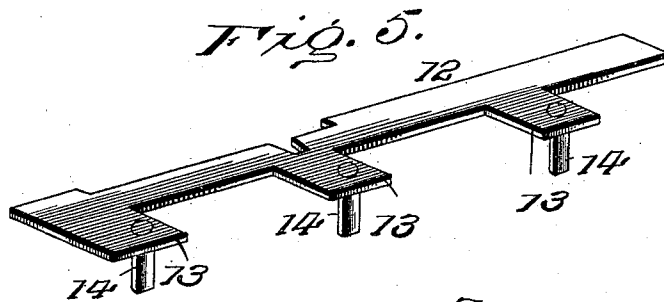
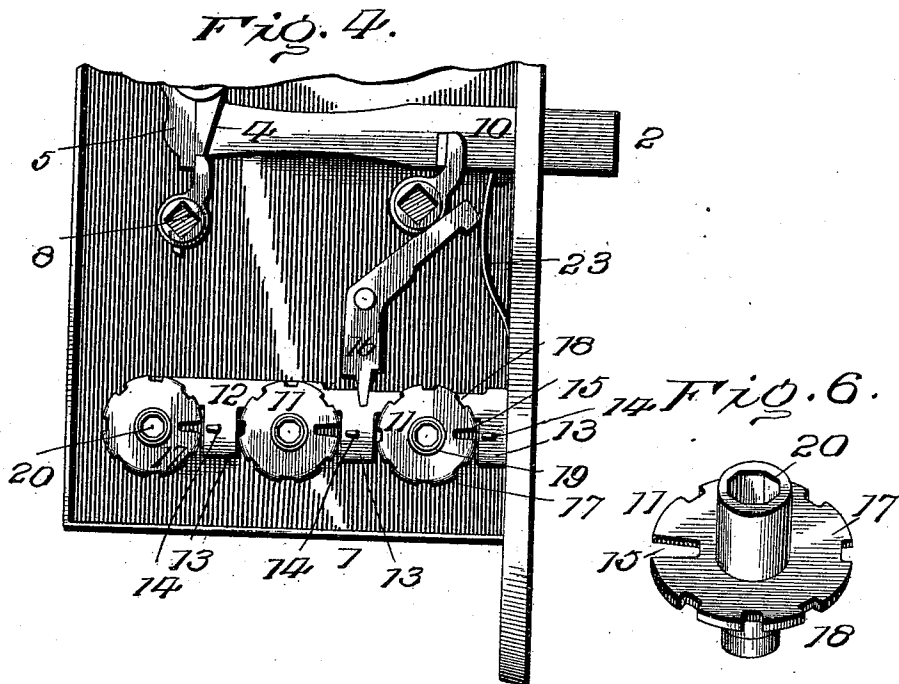
by *R. H. Racey* his Attorney

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2 Sheets—Sheet 2.



Witnesses

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UNITED STATES PATENT OFFICE.

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PERMUTATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 635,549, dated October 24, 1899.

Application filed February 16, 1899. Serial No. 705,672. (No model.)

To all whom it may concern:

Be it known that I, ROBERT W. INGLIS, a citizen of the United States, residing at Summitville, in the county of Madison and State of Indiana, have invented certain new and useful Improvements in Permutation-Locks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention has relation to locks of the keyless variety designed chiefly for house-doors, and which will be as safe as the general run of door-locks operated by means of a key and be superior thereto, since the person is not required to carry a key. The lock is constructed so as to be readily opened in the dark by a person having knowledge of the combination and accustomed to operate the lock and to have the combination changed easily and with despatch.

The improvement consists of the novel features, details of construction, and combination of parts, which hereinafter will be more fully described, illustrated, and claimed.

Referring to the drawings forming a part of this specification, Figure 1 is a face view of a portion of a door, showing the lock in position. Fig. 2 is a plan section on the line X X of Fig. 1. Fig. 3 is an elevation of the lock, the covering-plate of the casing being removed. Fig. 4 is a view in elevation of the reverse side of the permutation mechanism, showing its relation to the latch-bolt. Fig. 5 is a detail view of the bar cooperating with the tumblers. Fig. 6 is a detail view of a tumbler. Fig. 7 is an edge view of the dial-plate.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The lock shown is of the type to be let into the mortise of a door and is of ordinary construction, being selected to illustrate the application of the invention, it being understood that the permutation mechanism with slight changes can be adapted to any of the various styles and makes of locks.

The operating parts are located within the casing 1 and are disposed so as to occupy the smallest amount of space possible, the casing

having a side detachably connected therewith to admit of access to the mechanism when required for any purpose. The latch-bolt 2 is of ordinary formation and is operated by the knob-spindle 3, through the intervention of the usual cam 4 and spring-actuated lever 5. The cam 4 is adapted to be locked against movement in either direction by means of the thumb-lever 6 in the ordinary way. The latch-bolt can be thrown independently of the knob-spindle by means of the inner thumb-knob 7, together with its cam 8, and the outer thumb-knob 9 with its cam 10.

The permutation mechanism consists of a series of tumblers 11, spaced apart and arranged in a line, a bar 12, formed with projecting portions 13, pins extending laterally from the projections 13 to cooperate with the notches or gates 15 of the tumblers 11, a spring-actuated lever 16, connecting the bar 12 with the latch-bolt-operating mechanism, so as to prevent movement of said latch-bolt by means of the outer thumb-knob when the locking mechanism is set, and indicating and setting mechanism for properly positioning the tumblers to admit of movement of the bar 12 when it is required to throw the latch-bolt to open the door.

The tumblers 11 are similarly constructed, and consist of disks 17, having notches or gates 15 to cooperate with the pins 14, and a series of false notches 18 to add to the difficulty of opening the lock by unauthorized parties. Hubs 19 project laterally in opposite directions from the sides of the disks 17 and are formed throughout their length with openings 20 to receive the spindles 21 of the thumb-knobs 22. The openings 20 are of such shape in cross-section as to interlock with the spindles 21, whereby the thumb-knobs and tumblers will move as a single part upon operating the said thumb-knobs. In the preferable construction the openings 20 are of octagonal shape and the spindles 21 are of corresponding cross-sectional outline, thereby admitting of the thumb-knobs and tumblers being relatively changed when it is required to alter the combination. The tumblers are rotatably mounted, being journaled in openings formed in the sides of the casing 1 by means of their hubs 19.

The bar 12 is slidably mounted in the cas-

ing and its projecting portions 13 operate in the space formed between the hubs 19 of the tumblers. The pins 14, projecting laterally from the parts 13, are flattened and are adapted to enter the notches or gates 15 when the tumblers are set to bring said notches or gates into the predetermined position. The lever 16 has its lower end entering the notch formed in the bar 12 and is fulcrumed intermediate of its ends, the opposite end bearing against a portion of the cam 10, so as to prevent movement thereof when the permutation mechanism is set to prevent movement of the latch-bolt. A spring 23 coöperates with the lever 16 to hold it and the bar 12 in a normal position, whereby the pins 14 clear the tumblers.

The dial-plate 24 is applied to the outer side of the door 25 and carries the mechanism for operating and properly positioning the tumblers. The spindles 21 of the thumb-knobs 22 are journaled in openings of the dial-plate and are held in place by pins 26 and by thumb-knobs 22 coming upon opposite sides of the dial-plate and extending beyond the openings formed therein through which the said spindles 21 pass. This will be plain when it is remembered that the spindles 21 are thrust through openings in the dial-plate. When applied to the dial-plate, the pins 26 are passed through openings formed transversely in the spindles and prevent their withdrawal, the thumb-knobs serving to limit the inward movement of the said spindles. Spurs or lugs 27 project inwardly from the thumb-knobs 22 and are adapted to enter any one of a series of openings 28 formed in the dial-plate concentric with the spindles 21, so as to hold the tumblers when turned to the required position to admit of the latch-bolt being thrown. The spindles 21 have a limited longitudinal play in the dial-plate, so as to admit of the spurs or lugs 27 being engaged with or disengaged from the openings or depressions 28. These openings 28 being disposed in a circular series are graduated, so as to determine the proper positioning of the tumblers, which is accomplished by turning the thumb-knobs 22 until the spurs or lugs 27 are brought opposite the character or graduation selected to determine the correct position of the tumblers to admit of a movement of the bar 12, so that the throwing or shooting of the latch-bolt may be effected. When it is required to change the combination, the tumblers are turned so as to bring their notches or gates 15 into registry with the pins 14, after which the dial-plate is loosened and moved outward, so as to withdraw the spindles 21 from engagement with the hubs 19, when the thumb-knobs 22 can be turned to any desired position without changing the relation of the tumblers. The dial-plate is now replaced, the spindles 21 sliding into the openings 20 of the hubs, thereby accomplishing the desired result.

It is contemplated to apply the permutation mechanism to any of the varieties and styles of locks in general use, and in such adapta-

tion it is obvious that various changes in the form, proportions, and details of construction may be resorted to without departing from the nature of the invention.

The thumb-knobs 22 are flat and have one of their edges formed with a notch 29. These notches serve as guides and enable the operator to determine the proper positioning of the tumblers in the dark by feeling.

Having thus described the invention, what is claimed as new is—

1. In a lock, in combination with the latch-bolt, a permutation mechanism comprising a series of individual tumblers spaced apart and independently mounted, a bar common to all the tumblers of the series and having offstanding projections to enter the gates of the tumblers and independent of and spaced from the latch-bolt, independent means for properly positioning and operating the individual tumblers, and a spring-actuated lever interposed between said bar and the latch-bolt-operating mechanism and adapted to prevent movement of said latch-bolt when the permutation mechanism is set, substantially as set forth.

2. In a lock; the combination with the latch-bolt, and a thumb-knob-operated cam for throwing the latch-bolt, of a series of individual tumblers spaced apart and independently mounted, independent means for properly positioning and operating the individual tumblers, a bar common to all the tumblers of the series and having offstanding projections to enter the gates thereof and independent of and spaced from the latch-bolt, a lever interposed between the said bar and the aforementioned thumb-knob-operated cam, and a spring for holding the lever and bar in a normal position, substantially as described.

3. In permutation mechanism for locks, a tumbler, a dial-plate having a circular series of openings or depressions and a thumb-knob having a spindle journaled in the dial-plate and adapted to make adjustable connection with the tumbler so as to admit of the combination being altered, said thumb-knob having a spur to interlock with any one of the series or depressions of the dial-plate to hold the tumbler in any desired position, substantially as set forth.

4. In permutation mechanism for locks, the combination with a tumbler, and a dial-plate having a circular series of openings or depressions, of a thumb-knob having a spindle mounted in the dial-plate so as to turn and have a limited longitudinal play and adapted to have adjustable connection with the tumbler to admit of the combination being altered, and having a spur to coöperate with the aforesaid circular series of openings or depressions to fix the position of the tumbler, substantially as described.

5. In a lock, the combination with the latch-bolt and actuating mechanism therefor, of a series of individual tumblers independently mounted and spaced apart, a bar common to

all the tumblers of the series and having projecting parts operating in the spaces formed between them and provided with offstanding projections to enter the gates of the tumblers,
5 connecting means between said bar and the actuating mechanism of the latch-bolt, a dial-plate having a circular series of openings or depressions, and thumb-knobs applied to the dial-plate and adapted to make adjustable
10 connection with the tumblers to admit of the combination being altered, said thumb-knobs

having projections to cooperate with the openings or depressions of the dial-plate to hold the tumblers in any required position, substantially as described.

In testimony whereof I affix my signature
in presence of two witnesses.

ROBERT W. INGLIS. [L. S.]

Witnesses:

ALLEN PETERS,
ENOCH M. BLOSE.