

(No Model.)

W. F. DONOVAN.
MASTER KEY PIN LOCK.

No. 567,305.

Patented Sept. 8, 1896.

Fig. 1.

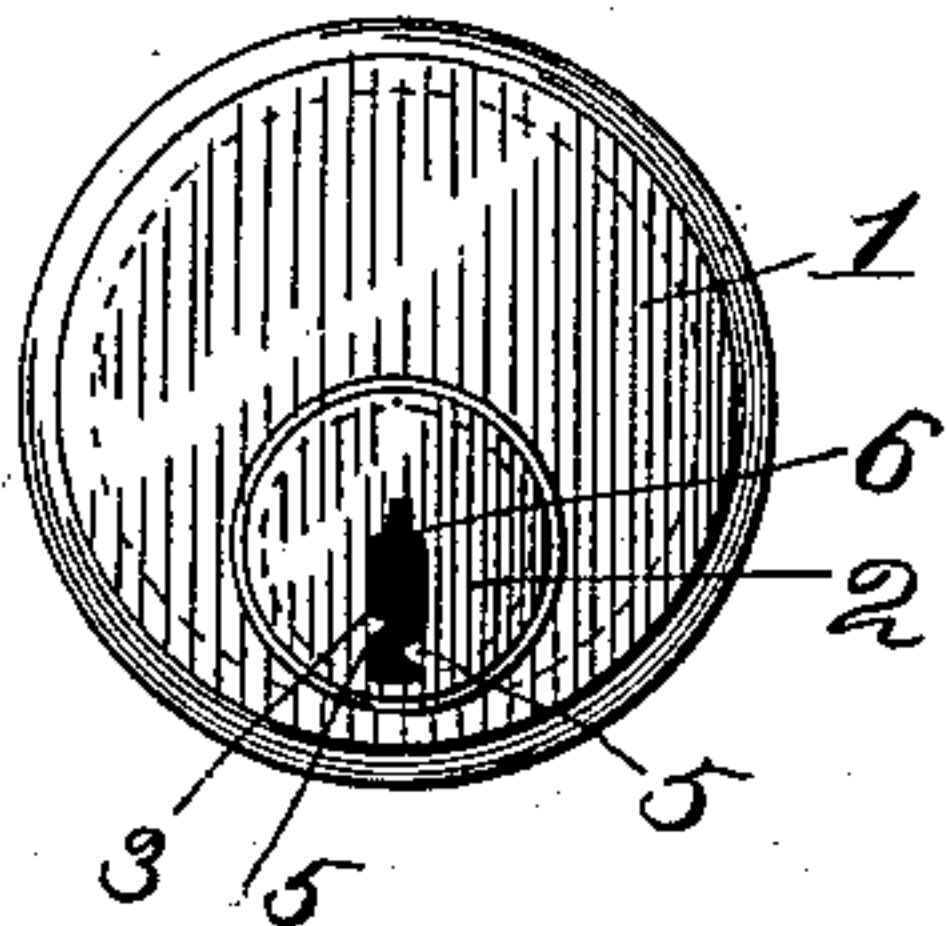


Fig. 2.

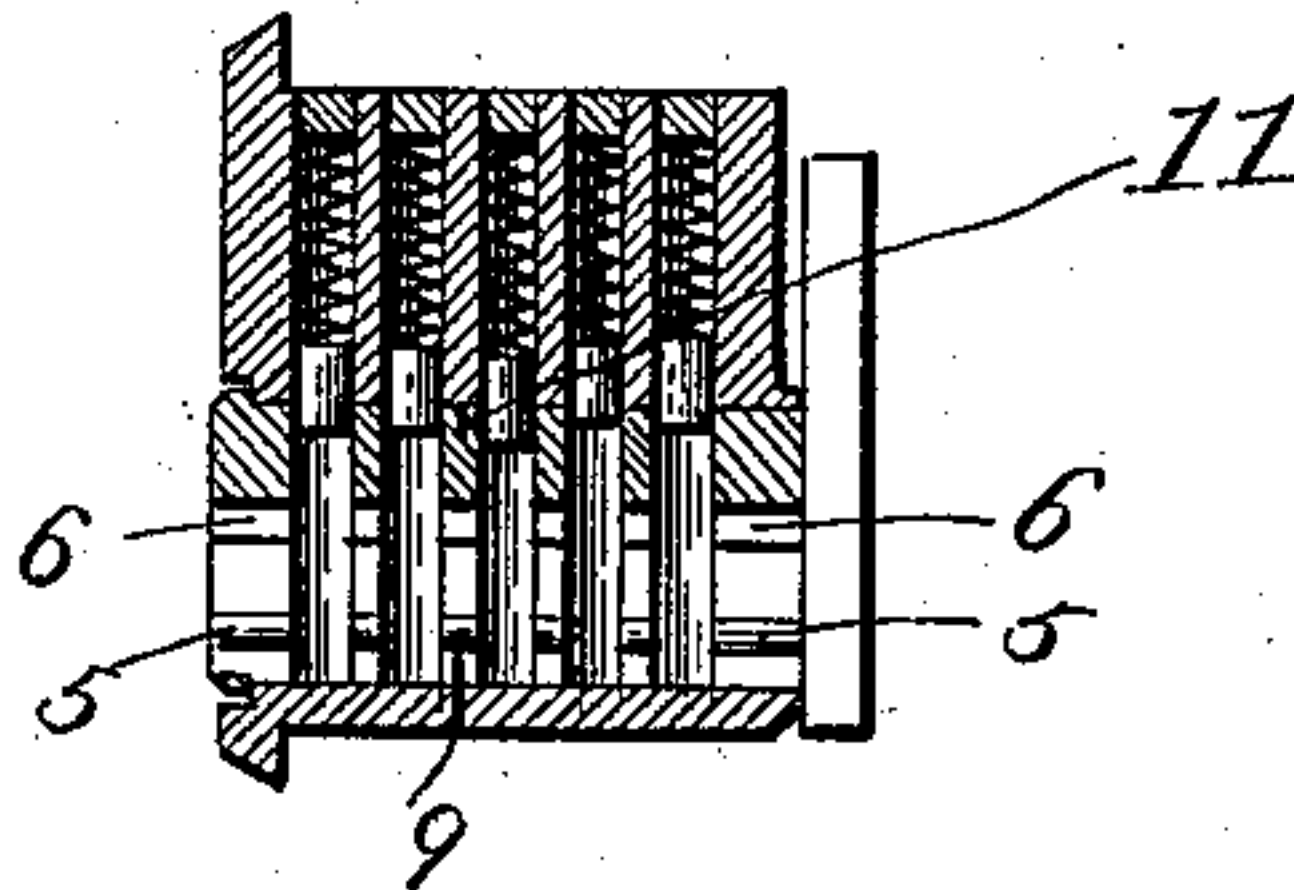


Fig. 3.

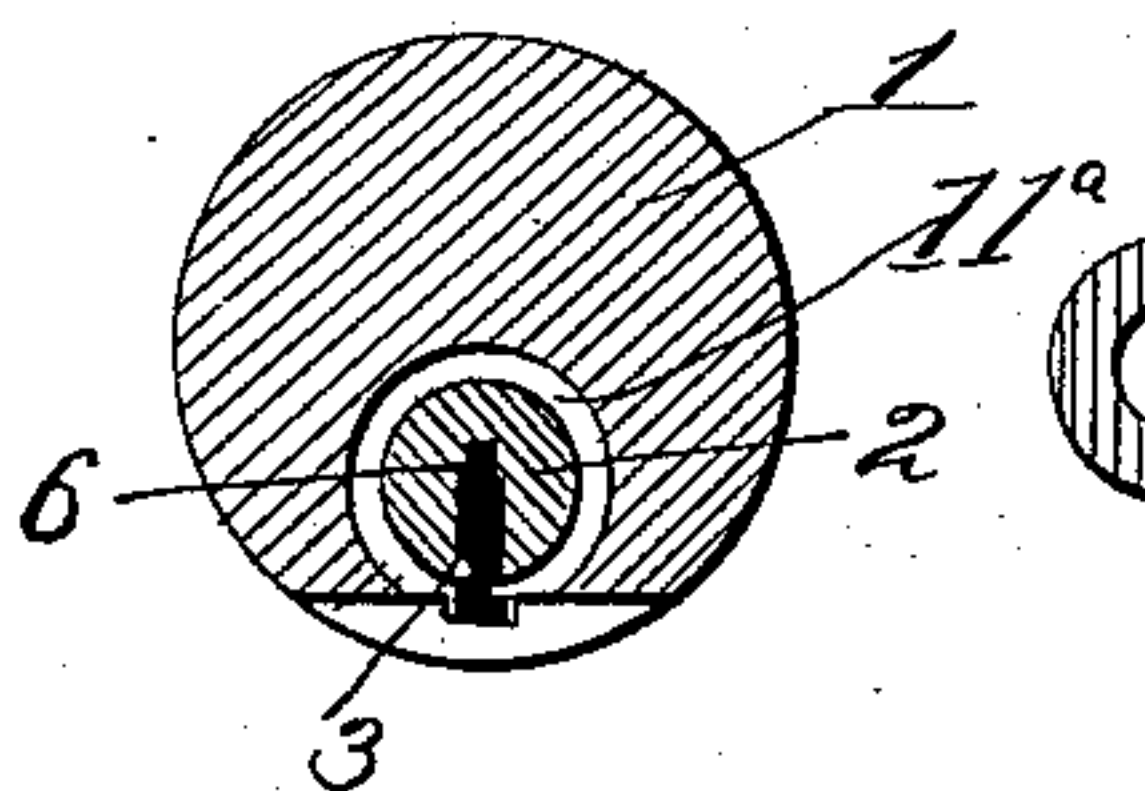


Fig. 4.

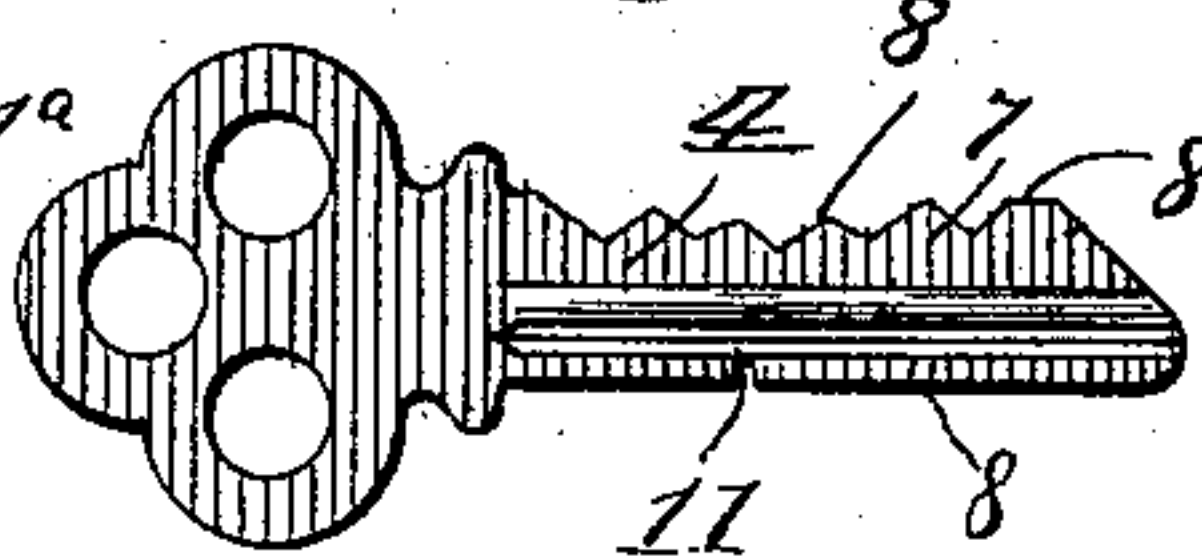


Fig. 6.

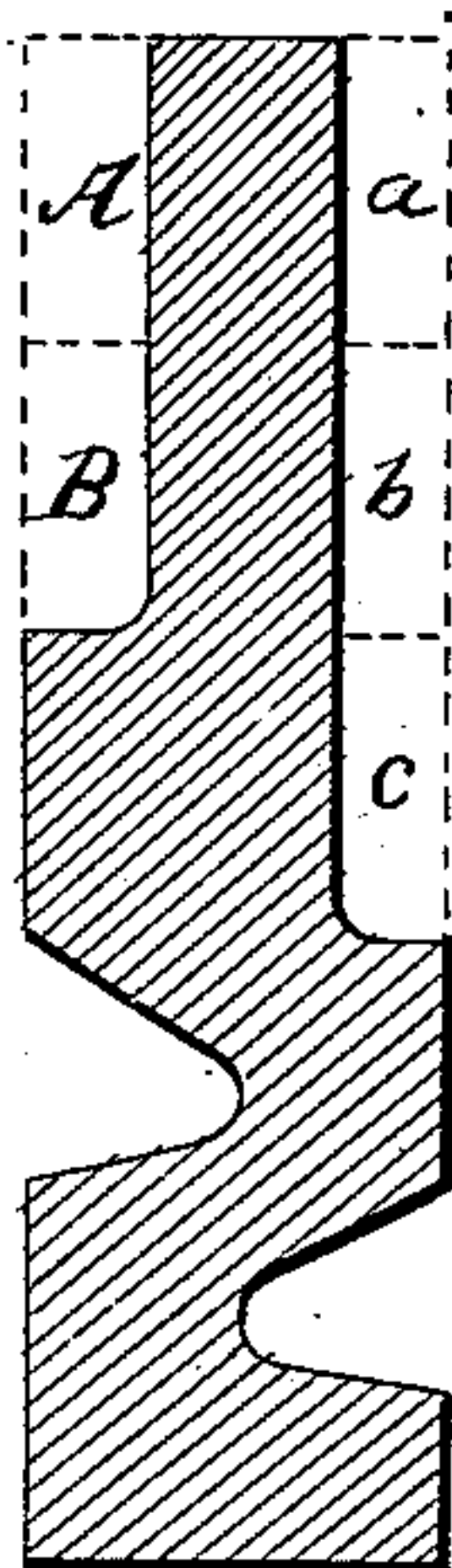


Fig. 5.

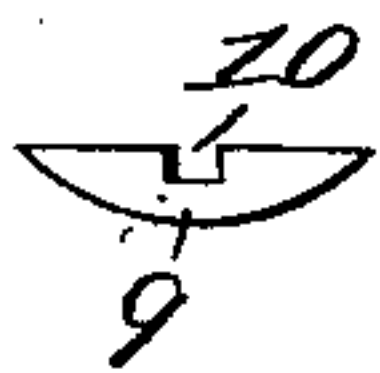
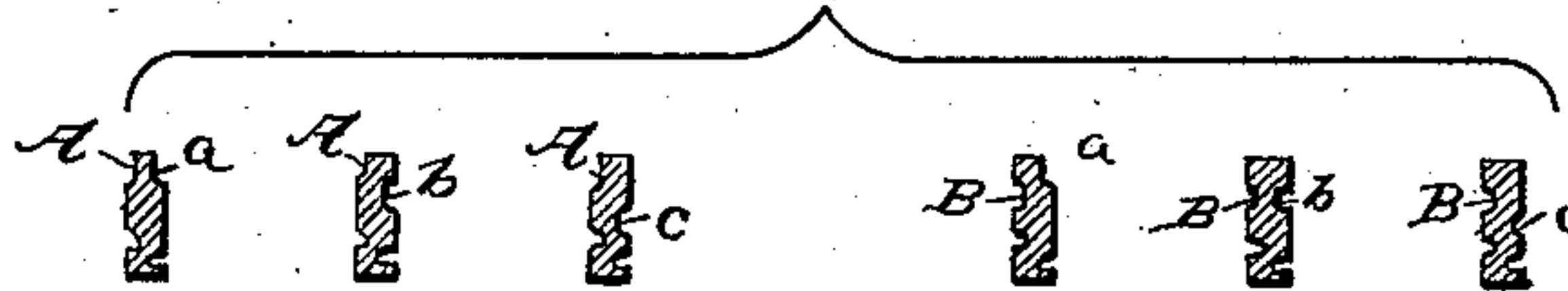


Fig. 7.



Fig. 8.



Witnesses:
Herbert Bradley
Jas. W. White

Inventor
William F. Donovan
by Knight Bros
Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM F. DONOVAN, OF NEW YORK, N. Y., ASSIGNOR TO THE YALE & TOWNE MANUFACTURING COMPANY, OF STAMFORD, CONNECTICUT.

MASTER-KEY-PIN LOCK.

SPECIFICATION forming part of Letters Patent No. 567,305, dated September 8, 1896.

Application filed December 7, 1895. Serial No. 571,436. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. DONOVAN, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Improved Master-Key Lock System, of which the following is a specification.

The invention relates to a master-key system for locks employing pin-tumblers or other form of tumblers set by the insertion of the key; and the invention consists in the arrangement of keyways in the plugs of such sections that only a special and distinctive key will enter each lock or minor group of locks, but yet all keyways are so constructed that there may be a key constructed which will enter all of a given series. This is accomplished by adding to the usual number of projections in the keyway additional projections but confining them within certain planes, so as to leave an open passage-way in order that the master-key can be inserted in all of a given series.

In the accompanying drawings, Figures 1 and 2 are, respectively, a front view and a vertical central section of a shell and its contained turning-plug. Fig. 3 is a transverse section through the shell and plug in the plane of the disk for producing an additional change. Fig. 4 is a side elevation of a key formed to enter and rotate the plug shown. Fig. 5 is a detached view of the disk inserted for increasing the changeable features of the system. Fig. 6 represents, on an enlarged scale, a key-section on which is indicated by dotted lines the various cuts which can be made in establishing different key-sections. Fig. 7 represents the section of a master-key having all the cuts made upon it. Fig. 8 represents some of the various combinations of cuts which can be made for differentiating keys.

1 represents the shell, 2 the turning-plug, having keyway 3, and 4 the key, constructed to enter the keyway shown. The keyway may be provided with the usual projections 5 for opposing the introduction of a key of improper section. In addition to these projections 5, and in carrying out my present invention, I dispose along the sides of the keyway 3, and at various points differing accord-

ing to changes to be made in the keys, projections or restrictions 6, which extend inwardly from opposite walls of the keyway, so as to require cuts or channels 7 in the key. The restricting projections 6 do not overlap each other, but are confined between planes in such a way as to leave a continuous open passageway of reduced thickness the full height of the keyway. This permits the bitting 8 to extend up into position to control the tumblers no matter what the section of the key may be. This condition is made use of in making a master-key for a series of locks, said master-key being of section shown in Fig. 7, from which it will be seen that the thickness of the upper portion of the key is reduced, so that no opposition will be offered by any of the inward projections.

To provide for other changes in the lock, and particularly for distinguishing between master-keys of different sets or series of locks, a disk 9 is inserted in the bottom of the shell, as shown, and having a notch 10, which permits the introduction of the key, so that in turning the key must have a coinciding notch 11 and the plug an annular groove 11^a. By changing the location of the disk 9 and of the key-notch 11 accordingly ample provision is made for changes in master-keys.

The different combinations of cuts which may be made in keys to permit the location of projections in the keyway may be understood upon reference to the enlarged key-section, Fig. 6, which illustrates an example. From this view it will be observed that it is possible to cut away within certain limits, so as not to interfere with the full depth of the key, either the sections A or B on one side of the key or the sections *a b c* on the other side. These five cuts permit of a number of changes to be made in different keys. Five combinations of cuts are shown in Fig. 8, these being A *a*, A *b*, A *c*, B *a*, B *b*, B *c*. Locks for which keys are prepared in accordance with these cuts would obviously have the projections 6 located opposite the sections shown cut away. It will be observed that there are other combinations which could be made of this limited number of cuts, and all cuts which could be made are not illustrated.

The essence of my invention consists, as

will be seen, in making all of these combinations of cuts on the key and projections on the keyways between certain limits or planes, so that with each one there is left in the keyway an unobstructed passage or space the full height of the keyway, which will permit the introduction of the master-key in each of the cuts so made, and upon the edge of the restricted portion of each may be made the biting necessary to control the tumblers.

My invention is well adapted for pin-tumbler locks, and with it a simple set of one or two division-tumblers may be employed, if desired, while the necessary changes in the master-keys are accomplished by controlling the entrance of the key into the lock and also by changing the combination of tumblers in connection with the changes in combination of the projections into the key-plug.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent—

1. A master-key system of pin-tumbler locks provided with key-plugs which rotate with the key, said plugs being provided with the usual inward projections so as to require correspondingly-positioned longitudinal

grooves on the key, and said plugs being also provided with the additional and differently-located projections so as to require corresponding and additional longitudinal grooves on the key especially adapted for each plug, and having said additional projections confined within certain planes so as to leave a continuous open passage-way of reduced thickness which is common to all the locks of the system and having the master-key cut away on its sides to an extent to avoid the additional projections so as to adapt it to enter the passage-way common to all the locks, substantially as herein explained.

2. In a master-key pin-tumbler lock, the combination with the key-plug which carries the tumblers and rotates with them, of one or more obstructions, set between the tumblers so that the key must be fitted not only to set the tumblers, but to pass such obstructions in order to actuate the lock, substantially as described.

WILLIAM F. DONOVAN.

Witnesses:

SCHUYLER MERRITT,
GEO. E. WHITE.