

(No Model.)

I. H. CLEVELAND.  
COMBINATION LOCK.

No. 605,271.

Patented June 7, 1898.

FIG. 1.

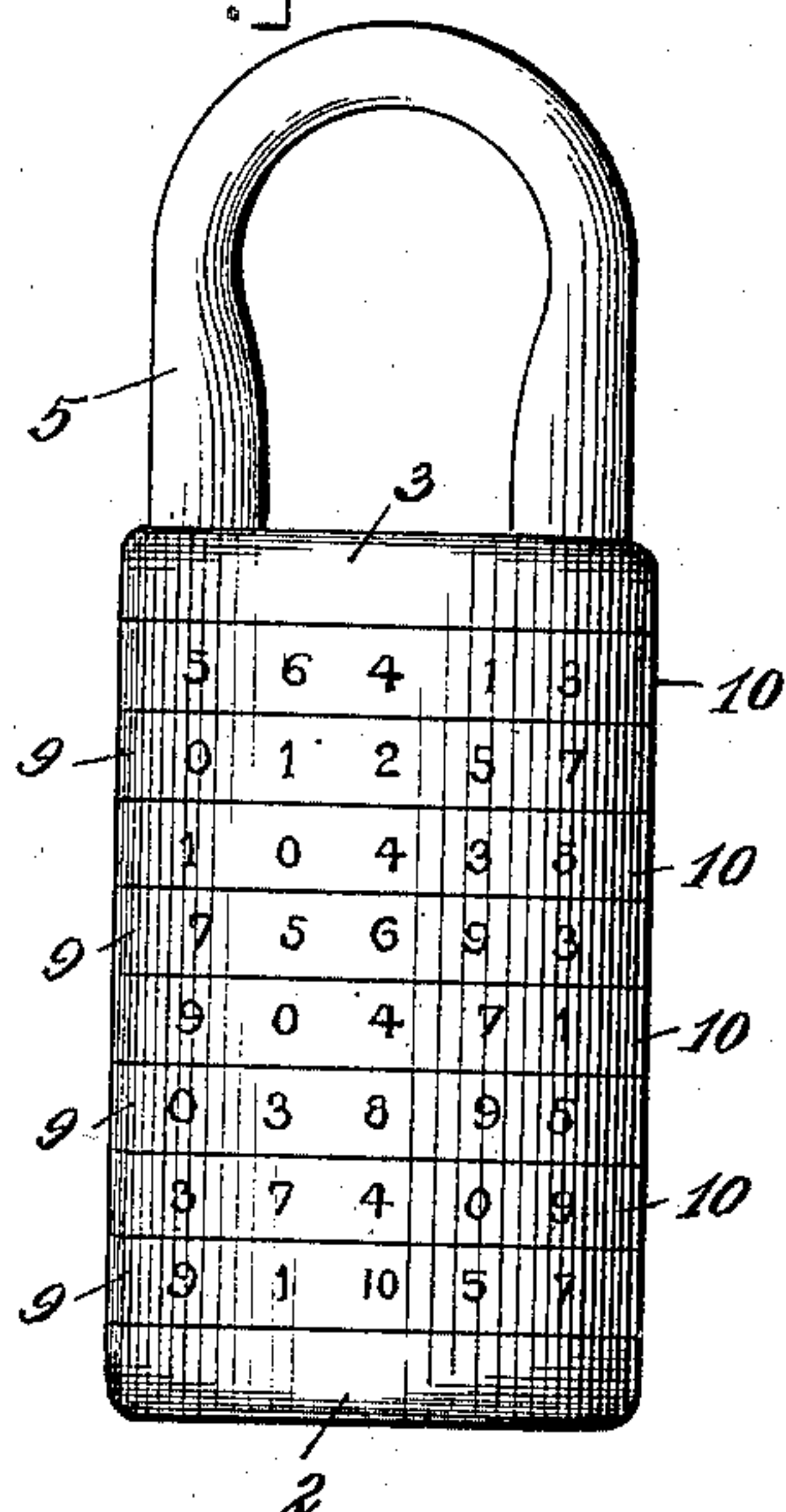


FIG. 2.

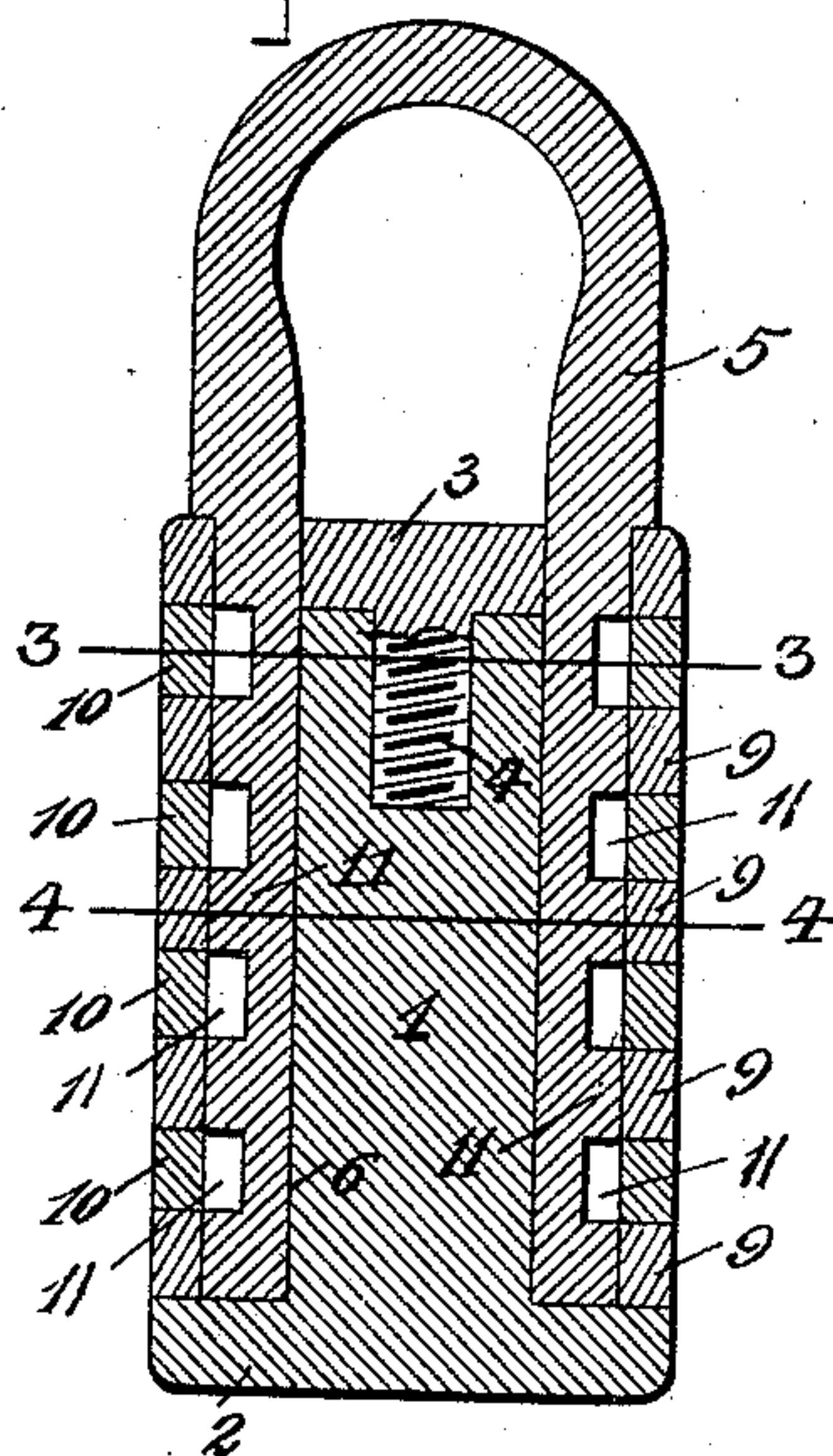


FIG. 3.

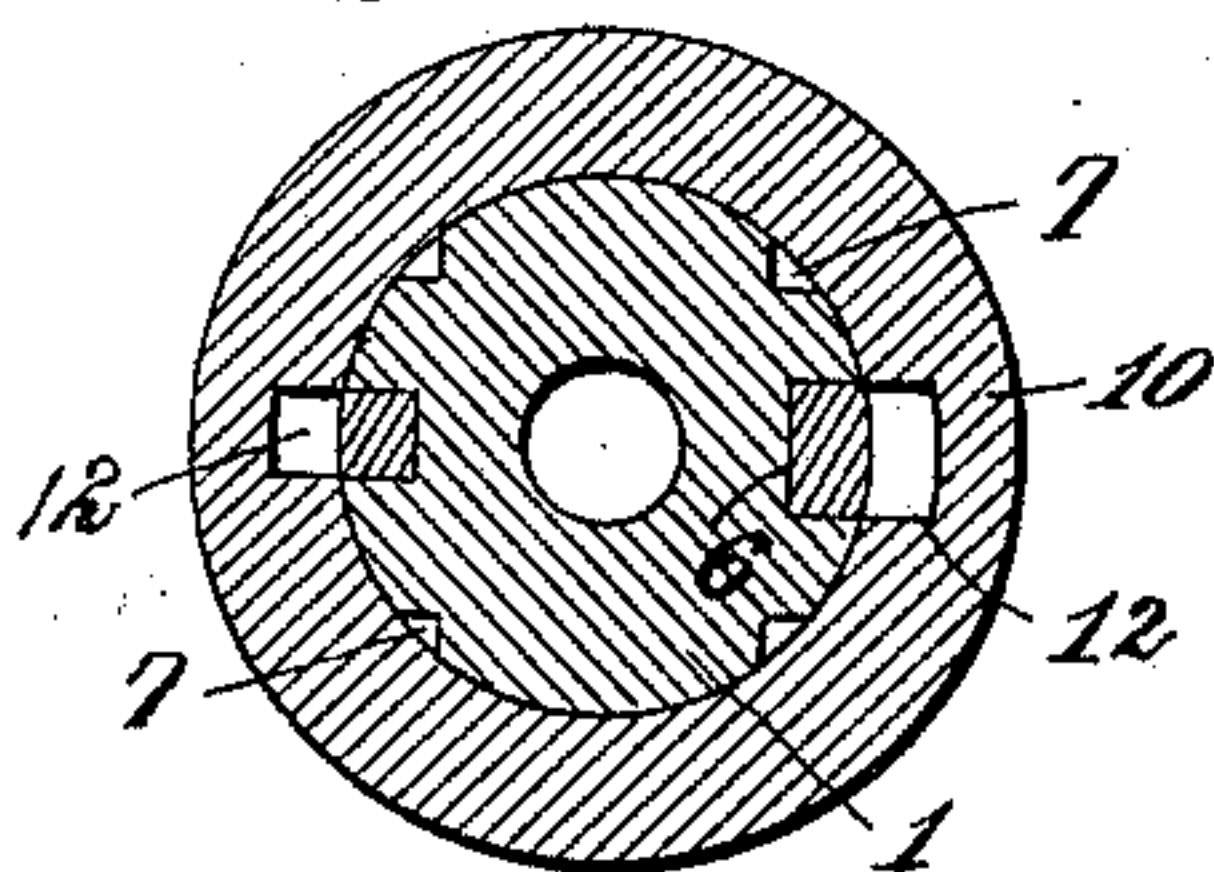


FIG. 4.

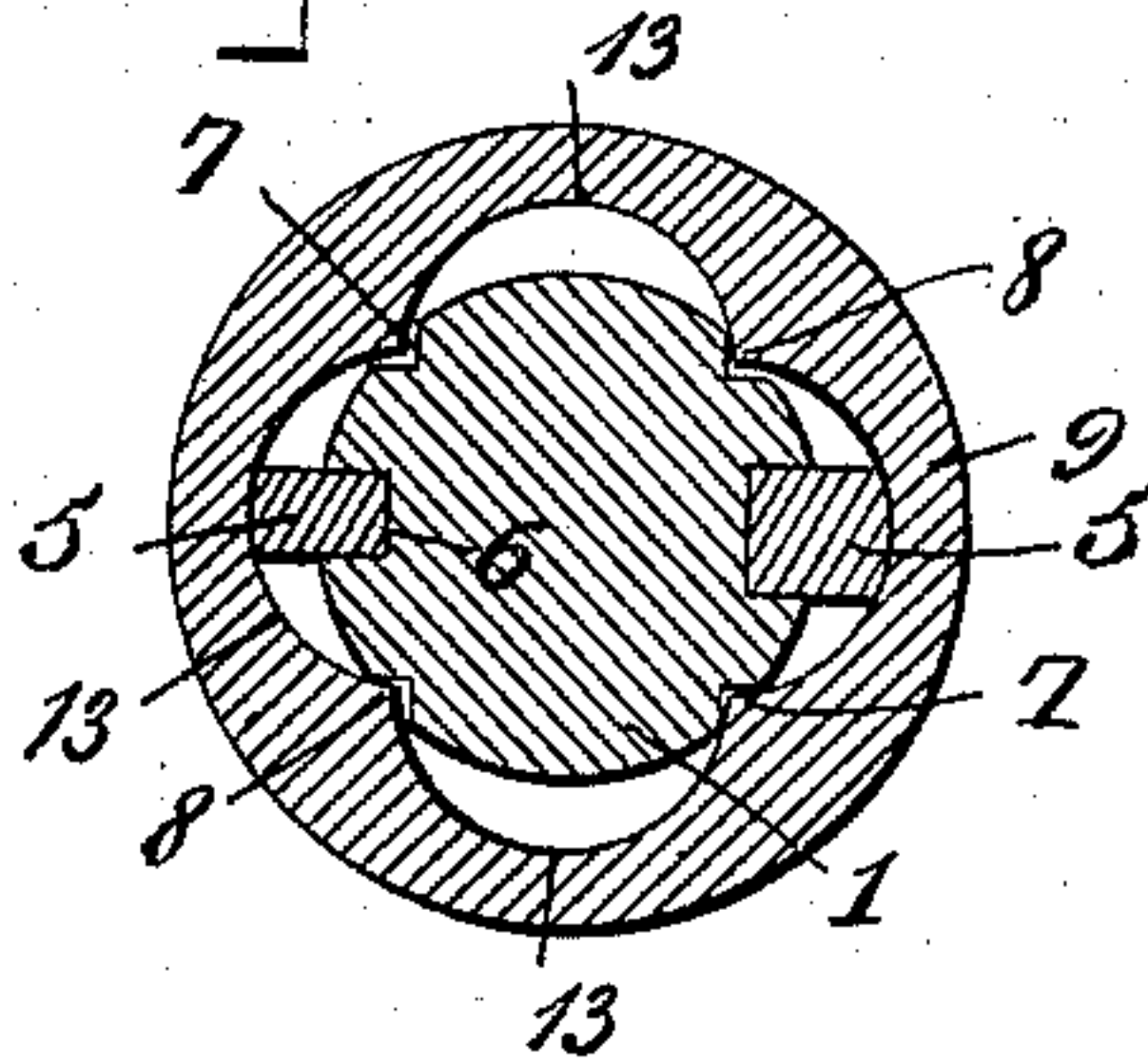


FIG. 5.

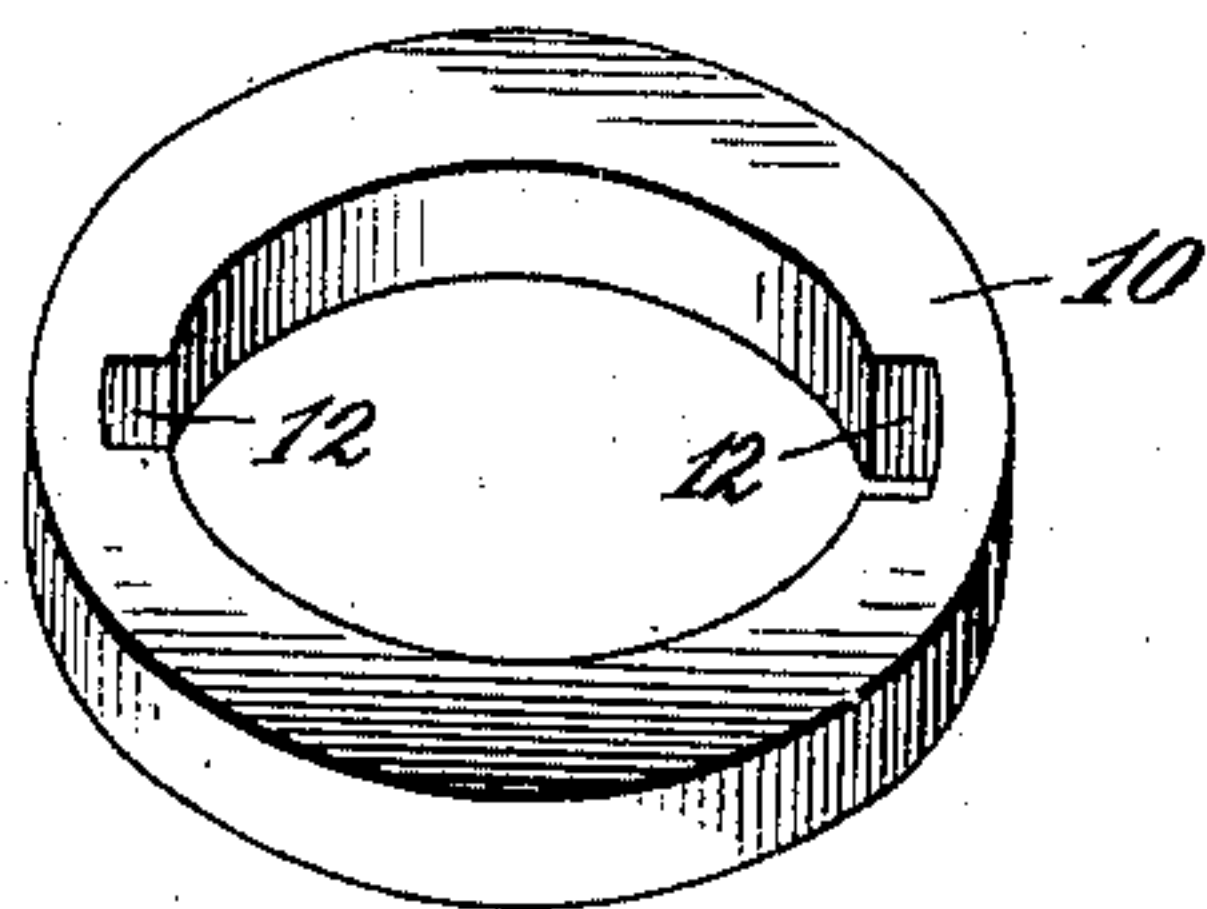
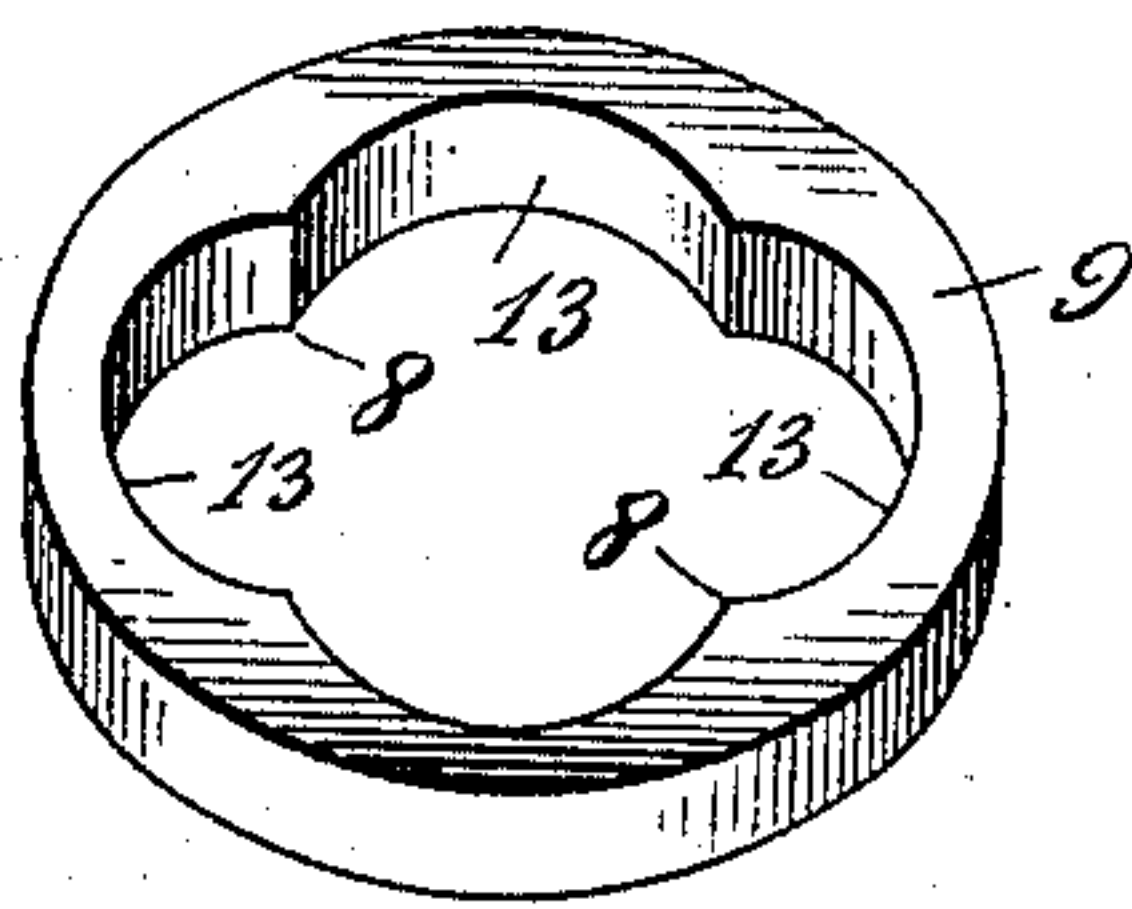


FIG. 6.



Inventor

*Isham H. Cleveland.*

Witnesses

John F. Seufferd  
V. S. Hoff

By *his* Attorneys,

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# UNITED STATES PATENT OFFICE.

ISHAM H. CLEVELAND, OF UNION, MISSISSIPPI.

## COMBINATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 605,271, dated June 7, 1898.

Application filed April 26, 1897. Serial No. 633,988. (No model.)

*To all whom it may concern:*

Be it known that I, ISHAM H. CLEVELAND, a citizen of the United States, residing at Union, in the county of Newton and State of Mississippi, have invented a new and useful Combination-Lock, of which the following is a specification.

My invention relates to improvements in permutation-padlocks of that class wherein a fixed core is used in connection with a column or series of tumblers and spacing-rings which are operatively combined with a removable shackle; and the object that I have in view is to provide a simple structure in which the shackle may be inserted into the lock only in one position and to enable each spacing-ring to be adjusted to a variety of positions, which adjustments of the individual rings provide a large number of changes in the combinations, because there are a number of spacing-rings used in the column or structure.

With these ends in view the invention consists in a permutation-padlock comprising a core having a base at one end, a central threaded socket at its upper end, longitudinal shackle-seats of different cross-sectional area in diametrically opposite sides of the core, and longitudinal V-shaped channels in the faces of the core between the longitudinal shackle-seats and parallel therewith; a series of tumblers fitted loosely on the core and provided with diametrical shackle-notches corresponding in area to the shackle-seats; a series of spacing-collars arranged alternately to the tumblers to form a column therewith and each having its inner edge formed of a series of arc-shaped faces which intersect to produce a series of four spurs adapted to be slipped loosely in V-shaped channels of the core to hold the spacing-rings against turning thereon, and said arc-shaped faces in the rings arranged opposite to the shackle-seats to enable the shackle-legs to pass through certain of the coincident recesses formed thereby around the core; a shackle having legs of different cross-sectional area and adapted to be readily fitted in the shackle-seats of the core, and a cap with a threaded stem to screw into the core-socket and confine the column of rings and tumblers.

In the drawings, Figure 1 is a side view of

a lock constructed in accordance with my invention. Fig. 2 is a central sectional view of the same. Fig. 3 is a transverse section in a plane indicated by the line 3 3 of Fig. 2. Fig. 4 is a similar view taken in the plane indicated by the line 4 4 of Fig. 2. Fig. 5 is a detail view in perspective of one of the tumblers. Fig. 6 is a similar view of one of the spacing-rings.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates a core terminating at its lower end in an enlargement or base 2, and detachably secured to the upper end of the core is a cap 3, having a central threaded shank 4 for engagement with an axial bore of the core. This cap is provided with spaced openings for the reception of the legs of a shackle 5, and the core is provided at diametrically opposite points with shackle-seats 6 to receive said legs of the shackle. In order to provide for only one adjustment of the lock to open the same, the legs of the shackle are made of different cross-sectional areas, and the openings in the cap and the shackle seats or grooves in the sides of the core are adapted, respectively, to the sizes of the shackle-legs which are to be fitted therein. Furthermore, the core is provided with a plurality, as four, of longitudinal grooves 7 for engagement by inwardly-extending points or spurs 8 of the spacing-rings 9, said spacing-rings being interposed between contiguous tumblers 10, which are revoluble upon the core, to engage with the notches 11, which are formed in the outer sides of the shackle-legs.

In the construction of each spacing-ring, in carrying my invention into practice, the inner surface of the ring is formed in segments or arcs which are eccentric to the axis of said ring, the radius of each arc being less than a radius of the ring. The arc-shaped faces, which are eccentric to the ring, intersect with each other to produce the spurs 8, a series of which are provided within the annular edge of the ring, and these spurs lie equidistant from each other and from the axis of said ring, so that the ring is adapted to be adjusted to any one of a series of positions with relation to the core and to the rotating tumblers for providing, in connection with said tumblers,



a large number of changes in the combination of the lock. The spacing rings or collars are interlocked with the core to be held thereon against rotation by the provision of the  
 5 channels 7 in the faces of the core, and these channels correspond in number and position to the spurs on each spacing collar or ring, thus securely holding each spacing-collar in position at a number of points and providing  
 10 for a plurality of adjustments corresponding in number to the spurs 8 and channels 7. The desired method of adjustably fitting the spacing-collars to the core allows the collars to lie flush with the exposed faces of the tumblers, and the outer surface of the lock presents the appearance of a built-up column  
 15 formed by the alternately-arranged annular collars and tumblers. Said tumblers are also provided with diametrically opposite openings 12 of different areas to correspond with those of the shackle-seats in the core, and it is obvious that when the notches of the tumblers are in registration with their proper shackle-seats the shackle is free to be removed.  
 25 The spacing-rings and tumblers are provided with peripheral series of combination characters, as letters or numerals, the latter being preferable and being indicated in the drawings, and it is obvious that in order to  
 30 adjust the tumblers to release the shackle it is necessary to arrange them so as to establish a certain combination between the peripheral numerals of the tumblers and those of the spacing-rings, and hence in order to change  
 35 the combination it is simply necessary to remove the spacing-rings from the core and re-apply them after having given them a quarter, half, or three-quarter revolution in order to engage the spurs of said spacing-rings with  
 40 respectively different grooves in the core. The spacing-rings are cut away, as shown at 13, between the inwardly-extending spurs, in order to provide clearance for the outer sides of the shackle-legs and enable said rings  
 45 to be arranged in either of the several adjustments above indicated. It is obvious, furthermore, that by multiplying the number of grooves in the core and spurs on the spacing-rings the number of adjustments of the  
 50 latter, and hence the number of the changes of the combination, may be multiplied.

An important improvement of the lock embodying my invention consists in the fact that the shackle-seats and shackle-legs are of dif-

ferent cross-sectional area, whereby in order 55 to release the shackle it is necessary to cause a single specific adjustment of each tumbler. If the small notch of a tumbler is arranged in registration with the large shackle-seat, the shackle will be locked as effectually as 60 though no adjustment of the tumblers had been attempted.

A further advantage of the improved lock resides in the fact that the cap is threaded in the bore of the core and may be either applied 65 or removed by turning the cap, and that when the shackle is engaged with the openings of the cap and with the seats in the core said cap is locked against rotary movement, and hence the parts of the lock are securely held 70 in their operative positions.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this 75 invention.

Having described my invention, what I claim is—

A permutation-padlock comprising a cylindrical core provided with a base, a central 80 threaded socket at its upper end, the shackle-seats, 6, of different cross-sectional area in diametrically opposite faces of the core, and the series of longitudinal V-shaped channels, 7, in the faces of the core between and parallel to the shackle-seats; the spacing-rings 85 each having its inner edge formed of a series of arc-shaped faces, 13, struck from different centers and intersecting one with another forming a plurality of spurs, 8, spaced correspondingly to the channels, 7, in which the 90 spurs are fitted and said arc-shaped faces producing clearance-spaces opposite to the shackle-seats; a series of tumblers alternating with the spacing-rings and having shackle- 95 notches, 12, of corresponding cross-sectional area to the shackle-seats; a cap, 3, with a threaded stem which is screwed into the core-socket; and a shackle with its legs of different cross-sectional area fitted in the seats of 100 the core, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ISHAM H. CLEVELAND.

Witnesses:

W. E. PORTIS,  
 W. A. JAMES.