

(No Model.)

3 Sheets—Sheet 1.

J. C. BARR.
INDICATOR LOCK.

No. 428,711.

Patented May 27, 1890.

Fig. 1.

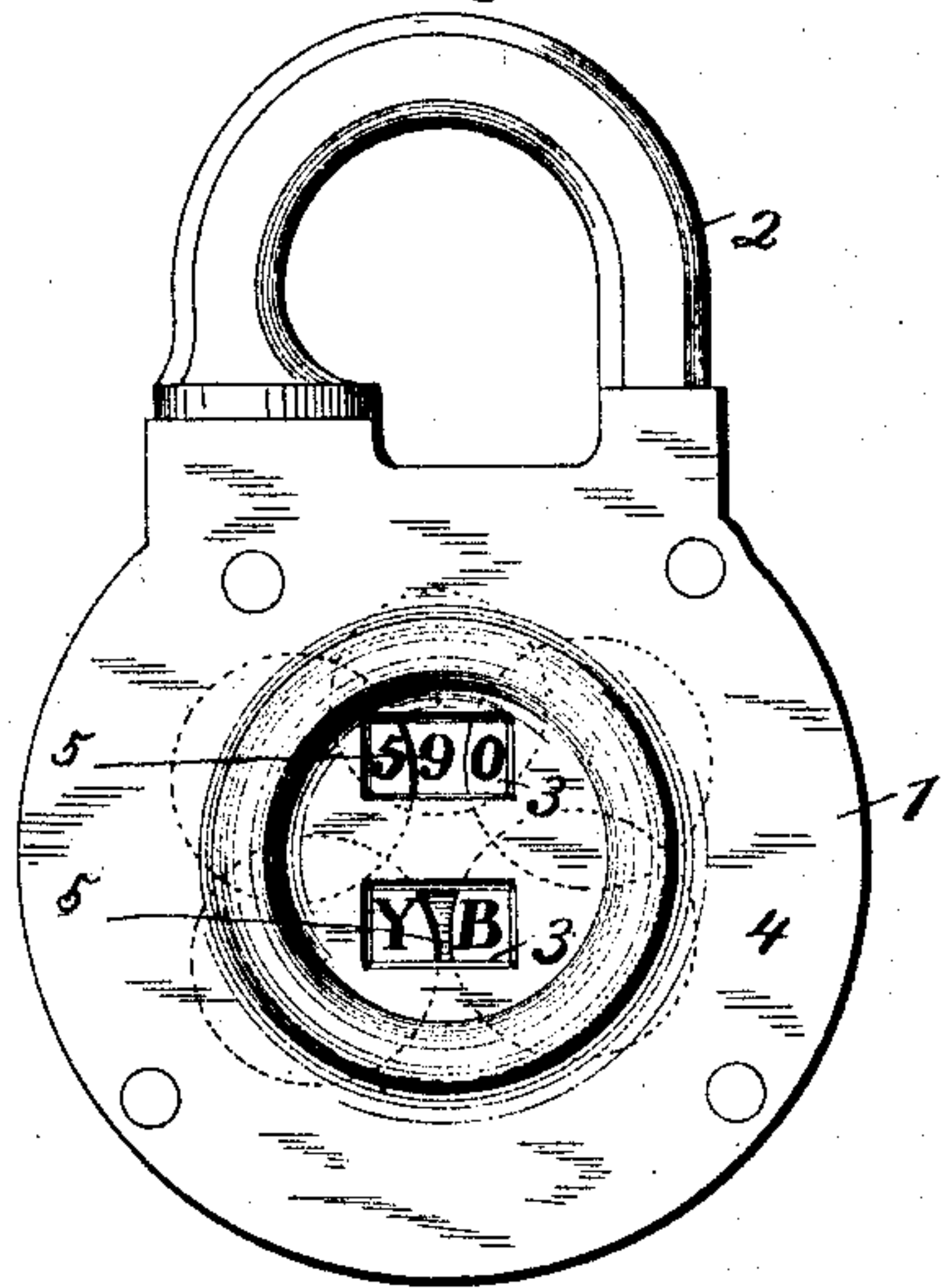


Fig. 2.

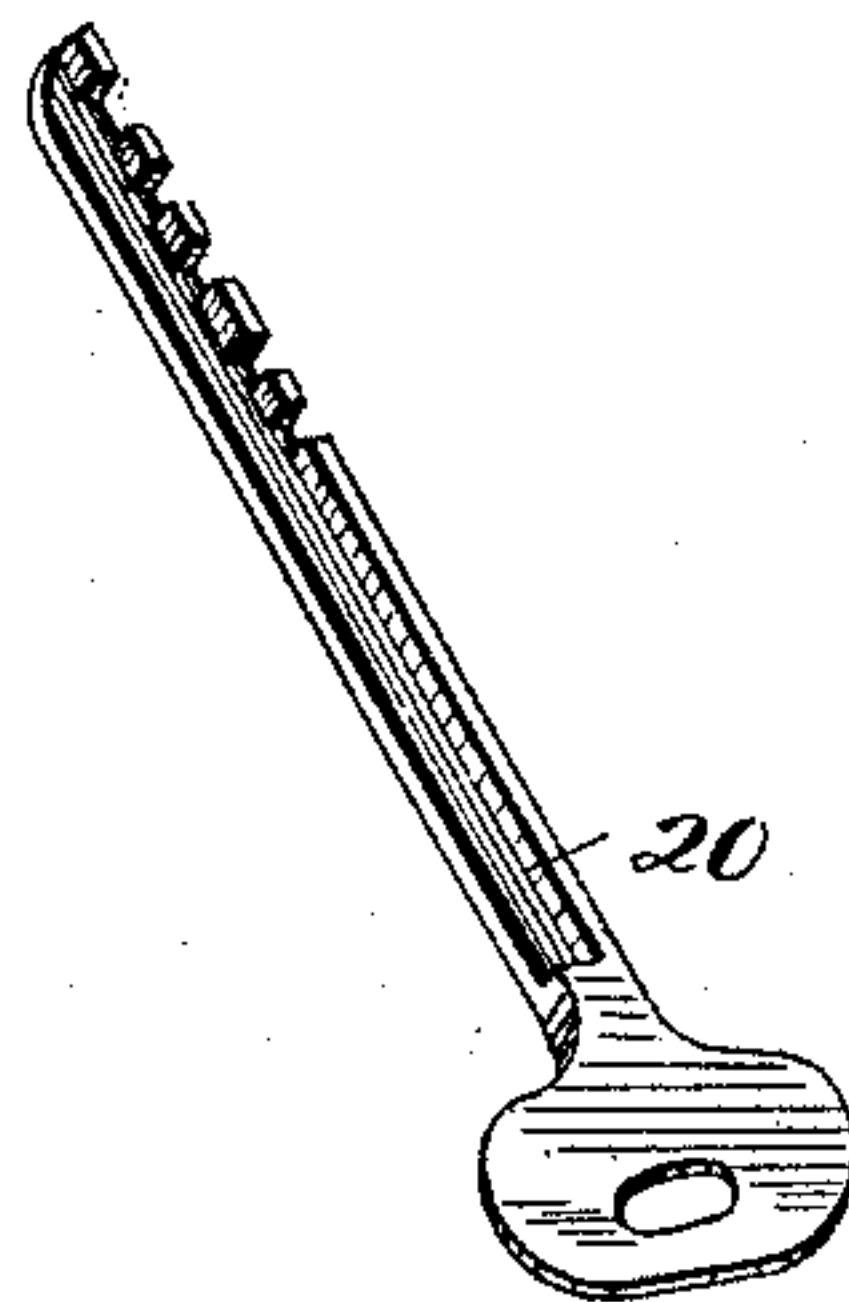


Fig. 3.

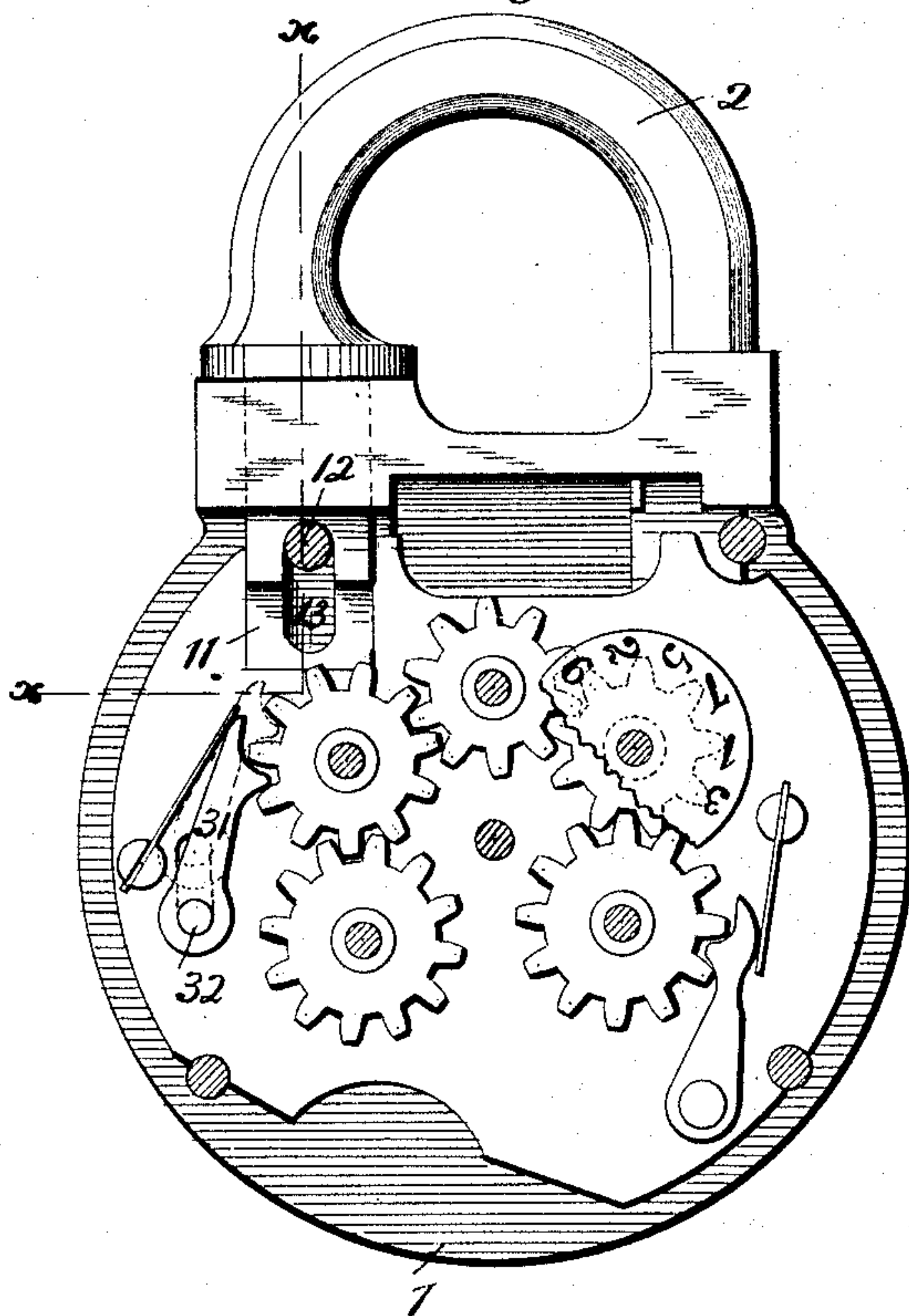
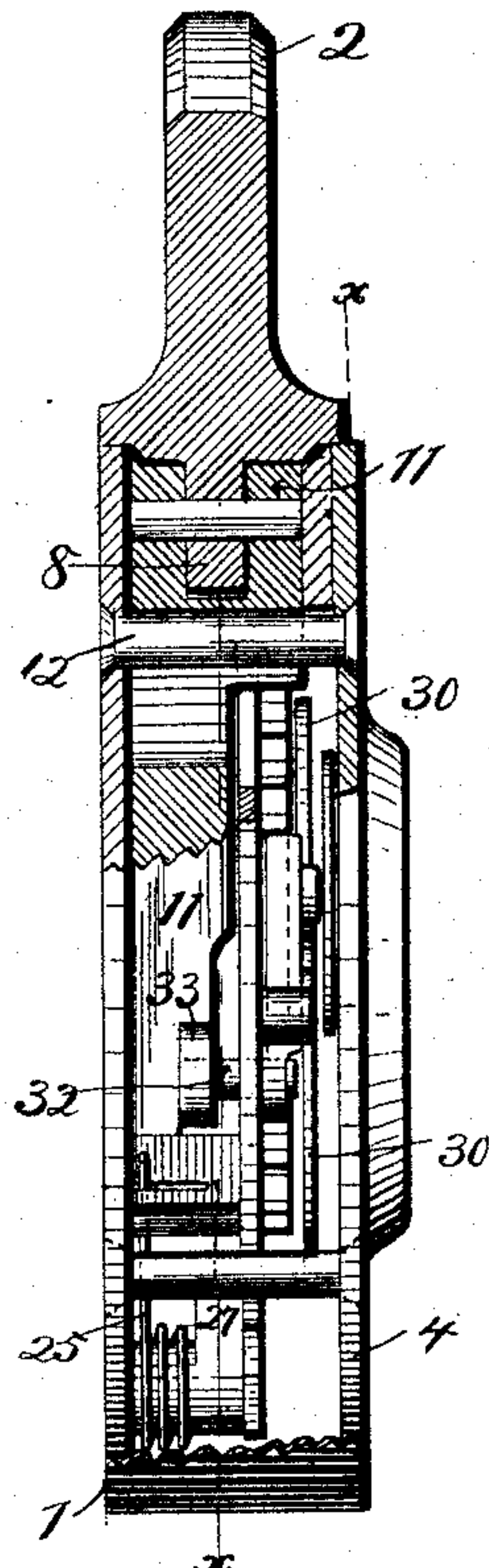


Fig. 4.



Witnesses.

J. Jensen.
A. M. Gaskill

Inventor

John C. Barr.
By Paul M. Munn, Att'y

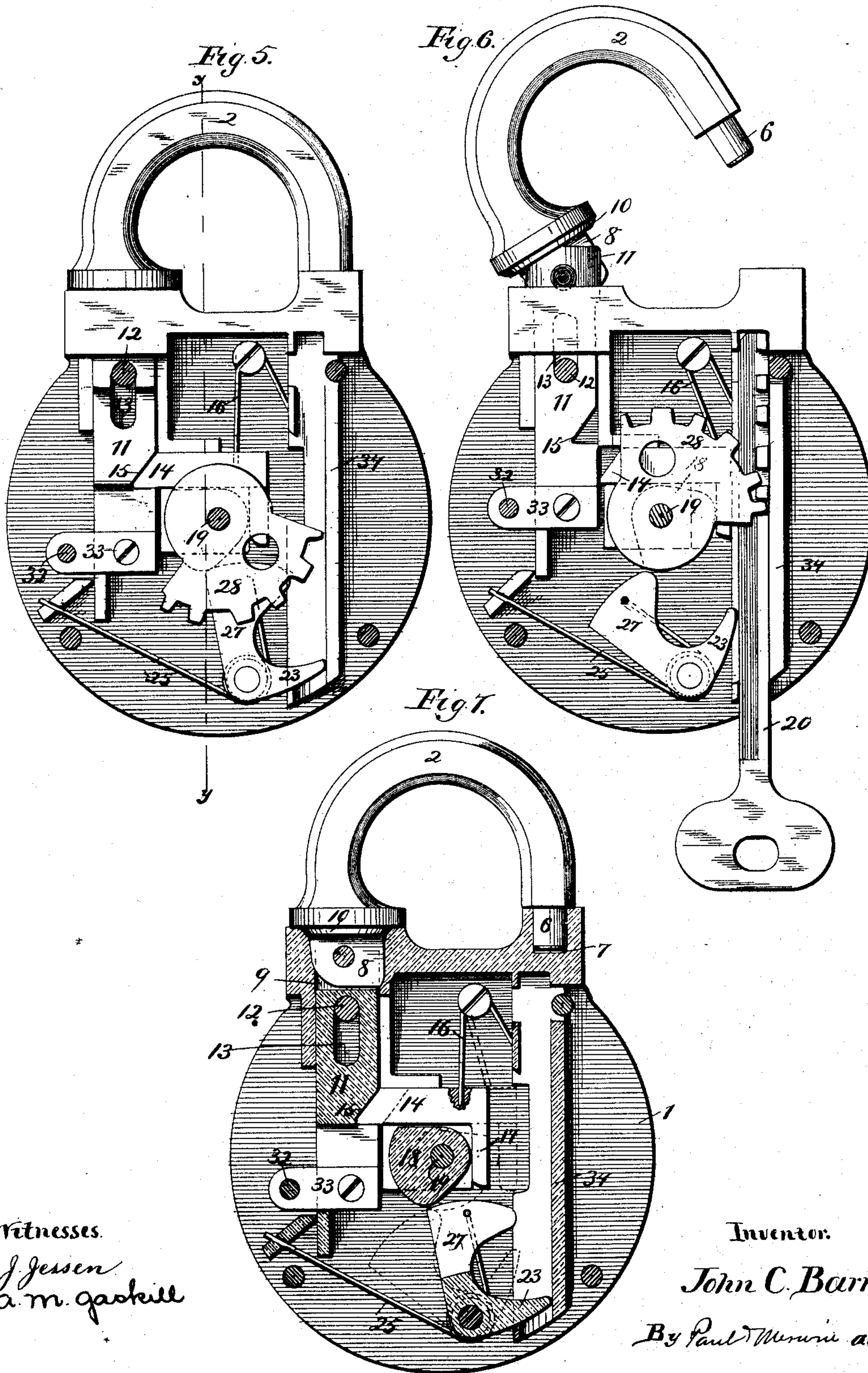
(No Model.)

3 Sheets—Sheet 2.

J. C. BARR.
INDICATOR LOCK.

No. 428,711.

Patented May 27, 1890.



Witnesses.
J. Jessen
a. m. gaskill

Inventor.
John C. Barr.
By Paul Merwin atty.

(No Model.)

3 Sheets—Sheet 3.

J. C. BARR.
INDICATOR LOCK.

No. 428,711.

Patented May 27, 1890.

Fig 8.

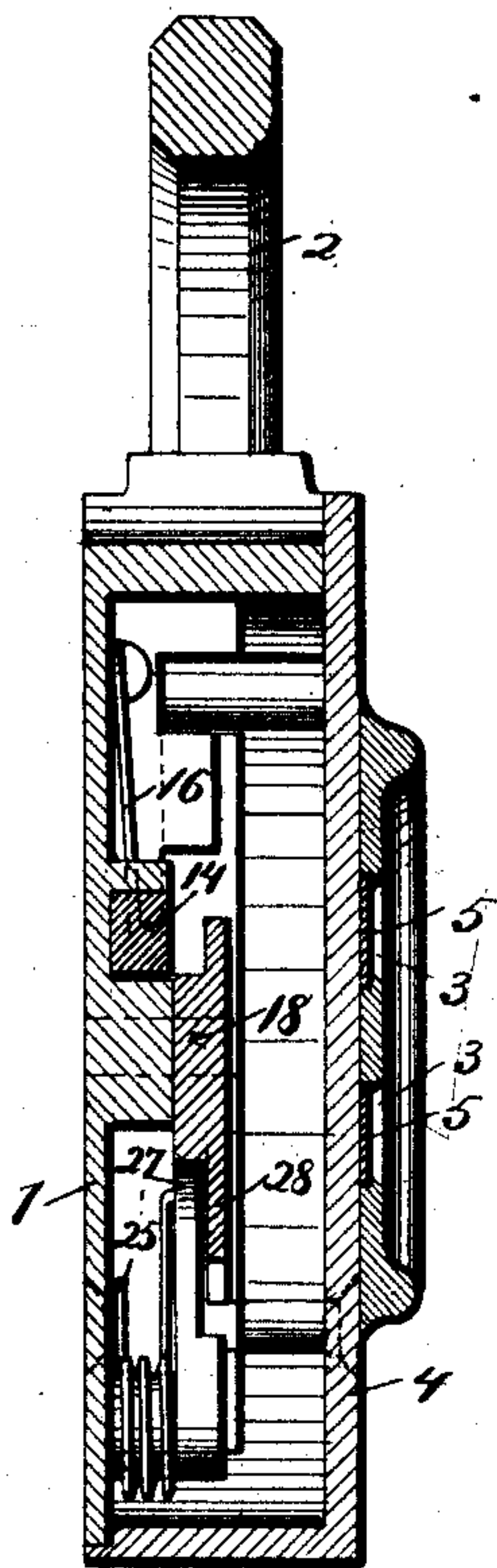


Fig 9.

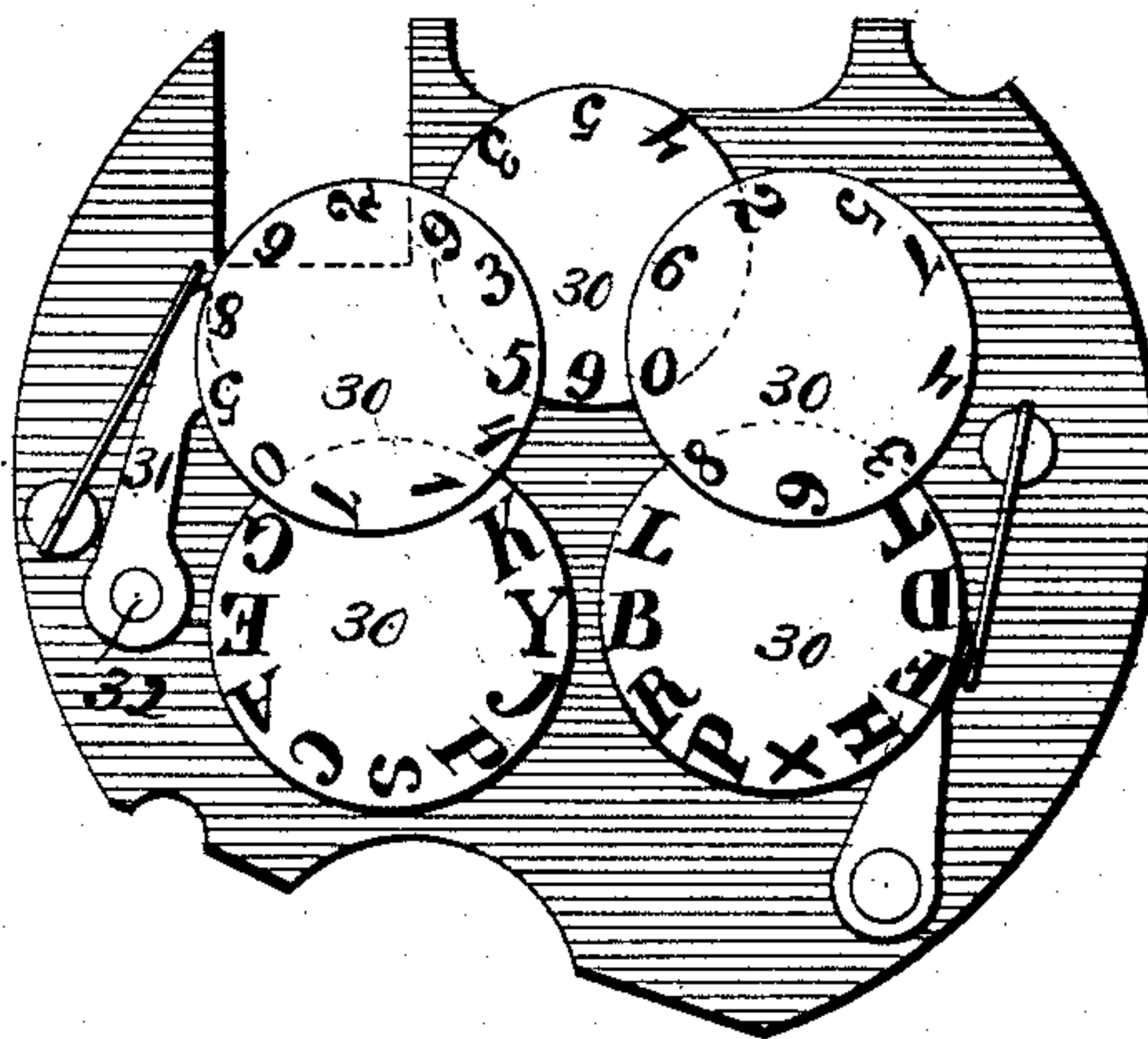


Fig 10.

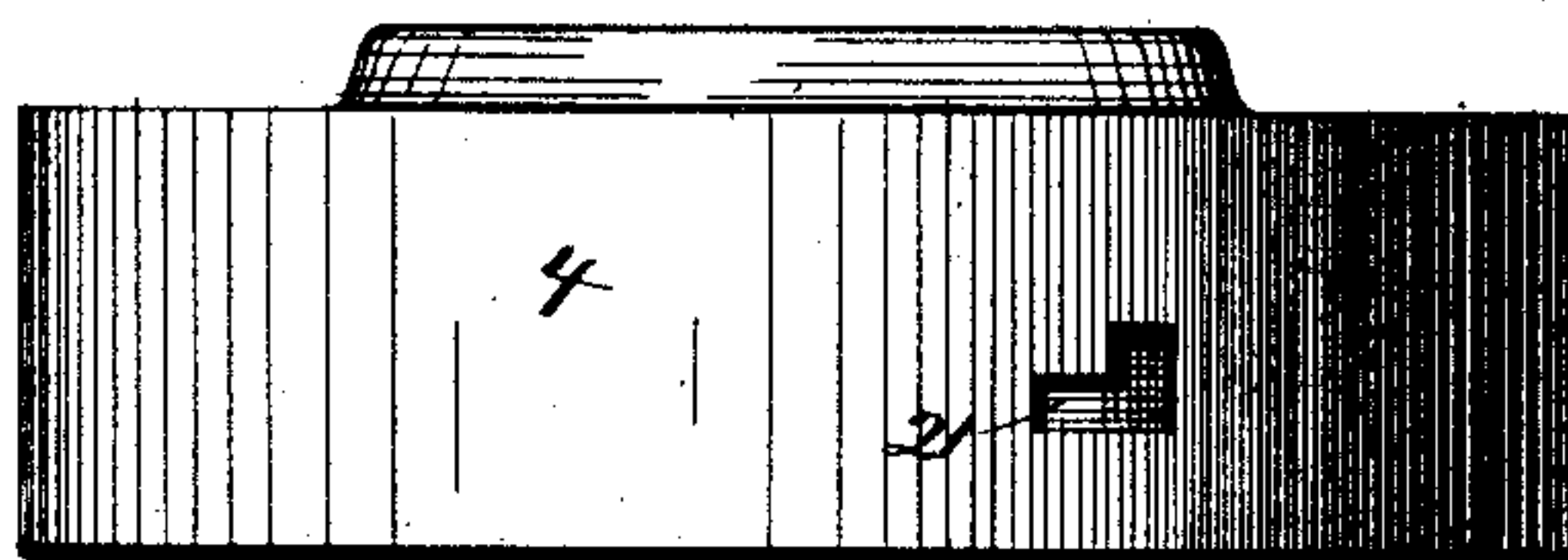
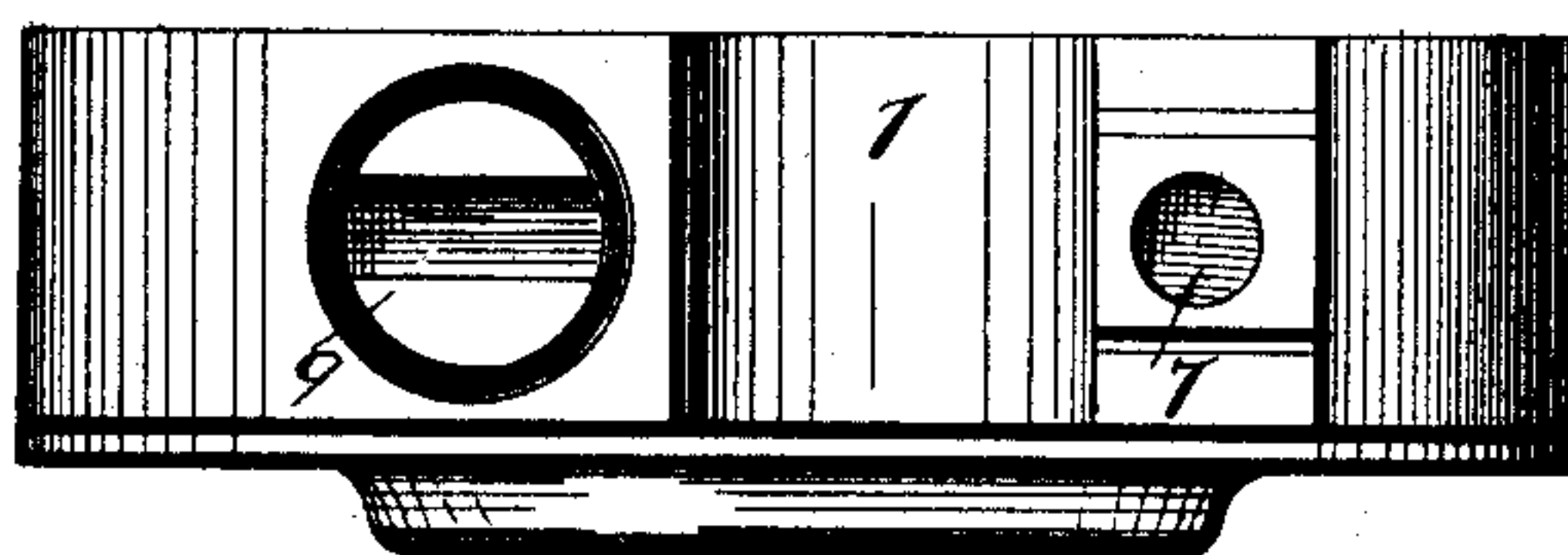


Fig 11.



Witnesses.

J. Jensen
a.m. gasbille

Inventor.

John C. Barr.

By Paul M. Mowbray attys.

UNITED STATES PATENT OFFICE.

JOHN C. BARR, OF ST. PAUL, MINNESOTA.

INDICATOR-LOCK.

SPECIFICATION forming part of Letters Patent No. 428,711, dated May 27, 1890.

Application filed May 2, 1889. Serial No. 308,959. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. BARR, of St. Paul, in the county of Ramsey, State of Minnesota, have invented certain new Improvements in Locks, of which the following is a specification.

This invention relates, generally, to improvements in locks, and more especially to that class of locks which is provided with devices for indicating that they have been unauthorizedly opened.

The invention consists, generally, in the construction and combination hereinafter described, and particularly pointed out in the claims.

The objects of the invention are, first, to provide a padlock with an improved shackle which cannot be tilted backward until after a sliding bolt to which it is secured is released, permitting the pivoted end of the shackle to be drawn out and released from a socket in which it is held when the shackle is fastened; second, to provide an improved locking mechanism for fastening the shackle, and, third, to construct a padlock that will be water-proof, thus permitting it to be used in exposed places with full protection to the mechanism of the lock.

In the accompanying drawings, forming part of this specification, Figure 1 represents a front or face view of my improved lock. Fig. 2 is a perspective view of the key. Fig. 3 is a face view with the face-plate and the indicating-disks removed. Fig. 4 is a side elevation and section on line *xx* of Fig. 3, with a portion of the lock-casing removed to show the indicating mechanism. Fig. 5 is a front view with the front plate and indicating mechanism removed. Fig. 6 is a similar view, with the key inserted in the lock and the shackle unfastened and raised. Fig. 7 is a central vertical section on line *xx* of Fig. 4. Fig. 8 is a vertical section on line *yy* of Fig. 5. Fig. 9 is a detail of the indicating mechanism. Fig. 10 is a bottom view of the lock-casing, showing the key-hole. Fig. 11 is a top view of the lock-casing with the shackle removed and showing the sockets which receive the ends of the shackle.

In the drawings, 1 represents the lock-casing, which may be of any desired shape and construction, and is provided in its face-plate

4 with two slots or openings 3, that are preferably covered with glass, mica, or other transparent material 5. The shackle 2 is of substantially the usual form, and is provided at its free end with a reduced portion or tenon 6, which fits into the socket 7 in the lock-casing. This socket is preferably of suitable size to form a close fit with the free end of the shackle, and the socket preferably does not communicate with the interior of the lock-casing. The other end of the shackle is provided with a tenon 8, which fits into a socket 9 in the lock-casing. This socket communicates with the interior of the casing. The upper end of this socket preferably flares outward, and the shackle is provided with a collar 10, which makes a water-tight fit with the end of the socket, whereby when the shackle is fastened water is precluded from entering the socket. The tenon 8 is pivotally secured to the shackle-bolt 11—that is, arranged within the interior of the lock-casing. This bolt is adapted to slide upward into the socket 9, being guided by a pin 12, which passes through a slot 13 in the bolt. When the bolt is in its elevated position, the pivotal point between the shackle and the bolt 11 is above the top of the socket 9, and the shackle may be tilted backward and its free end carried out of the socket 7. When the shackle-bolt is carried downward into the casing and the pivotal point between the bolt and shackle is brought inside of the socket 9, the shackle cannot be turned upon its pivot. The bolt 11 is provided with a beveled notch 15, and a sliding bolt 14, having a beveled end, is arranged within the lock-casing and is adapted to engage said beveled notch 15 and fasten the shackle-bolt 11 with the ends of the shackle in engagement with the sockets 7 and 9. A spring 16 engages the bolt 14 and tends to hold it at all times in engagement with the shackle-bolt 11. The rear end of the bolt 14 is provided with a projection 17, extending at right angles to the main portion of the bolt. A cam 18 is mounted upon a pivot 19, and is arranged to engage the projecting portion 17 of the bolt 14. When the shorter radius of the cam 18 is against the projection 17, the bolt 14 may engage the notch in the block 11. By turning the cam 18 upon its axis and bringing its longer radius against the projec-

tion 17 the bolt will be moved back against the tension of the spring 16 and withdraws from the notch 15.

I prefer to employ a key 20, of substantially the form shown in Fig. 2. This key consists, preferably, of a strip of angle-iron or other metal having a series of notches formed in one edge thereof. A key-hole 21, of substantially the form of the cross-section of the key, is arranged preferably in the lower part of the lock-casing. A pivoted stop 23 is arranged within the casing and closes the key-hole when the key is removed. A spring 25 is connected with this stop and holds it normally in position to close the key-hole. A dog 27 is secured to or formed integrally with the stop 23. This dog comes under the cam 18 when the cam is in its normal position, as shown in Fig. 7, and forms a stop therefor and prevents turning the cam upon its axis until the dog 27 has been moved out of the path of the cam, which is done by the insertion of the key. A plate 28 is secured to or formed integrally with the cam 18, and it has a curved edge, which is made in the arc of a circle of which the pivot 19 is the center. This plate is provided upon its edge with a series of notches, which are preferably of various sizes, thus forming upon the edge of the plate a series of teeth of various widths, but all of the same length. The key is likewise provided with a series of notches of various widths, which correspond with the teeth upon the edge of the plate. The plate thus forms a segmental gear and the key a rack-bar, which engages therewith. As the key is inserted, it first strikes the pivoted stop 23, pushing it away from the key-hole and moving the dog 27 from under the cam 18. As the key is advanced, the teeth thereon engage the notched plate, turning it upon its axis, and thereby turning the cam 18 and retracting the bolt 14. When the plate has been turned, so that the last tooth upon the plate engages the last notch upon the key, the bolt 14 will be withdrawn from engagement with the notch 15. The shackle-bolt 11 and the shackle may then be drawn out into the position shown in Fig. 6, and the shackle may then be turned back upon its pivot and the lock removed. When the key is drawn out of the lock, the segmental wheel will return to its former position, returning the cam to its former position, and the spring may then throw the bolt 14 into engagement with the notch in the shackle-bolt as soon as the shackle-bolt is returned to position to bring the notch opposite the end of the locking-bolt. When the key is withdrawn, the dog 27 and the key-hole stop 23 are returned to position by means of the spring 25. In order to guide the key as it is inserted into the lock, I provide a guide-plate 34, which extends from the key-hole across the interior of the lock-casing. This guide-plate is of angular shape in cross-section, so that the outer angle of the key fits against the plate. The distance from the

pivot of the segmental gear to the guide-plate 34 is equal to the radius of the segmental gear, so that as this gear is turned upon its axis the ends of the teeth come close to the guide-plate. This renders it impossible to turn the gear, except by the use of a key of the kind described having notches corresponding to the teeth upon the segmental gear.

The only openings to the interior of the lock-casing are the socket 9 and the key-hole 21. The socket 9, as before stated, is closed by the collar 10, which makes a water-tight joint with the end of the socket. The key-hole is also completely closed by the stop 23. It will thus be seen that the lock-casing is completely water-proof and the inclosed mechanism is fully protected.

I prefer to provide an indicating mechanism in connection with this lock, and this mechanism is preferably composed of a series of indicating-disks 30, as shown in Fig. 9. The operating-pawl 31 of the indicating mechanism is secured upon the sliding shackle-bolt 11, preferably by means of a pin 32 and plate 33, so that at each movement of the shackle-bolt the indicating mechanism is operated and the combination of figures and letters is changed each time the lock is unfastened, and it will be impossible to know what combination will be shown until the lock is unfastened and the shackle withdrawn.

It will be understood that by changing the size and arrangement of the teeth upon the key and upon the segmental gear-wheel a large number of combinations can be made, and it will be necessary to use the key having the corresponding arrangement of teeth to operate any one of the lot.

The key may be made of any desired width and height and the angles may extend in any direction, either toward the front or the back of the lock or toward either side, and the notches upon the key may be made upon either edge thereof.

I claim as my invention—

1. In a lock, the combination, with a locking-bolt and a cam engaging therewith, of a gear connected with said cam, and a sliding key provided with a series of teeth corresponding to the teeth upon said gear.

2. In a lock, mechanism for operating a bolt comprising in combination a gear provided upon its edge with a series of irregularly-spaced teeth of various widths, and a sliding key provided with a corresponding series of teeth adapted to engage the teeth upon said gear, whereby as the key is inserted into the lock with the sliding motion said gear is turned upon its axis.

3. In a lock, the combination, with a sliding bolt, of a gear having a cam connected with said bolt and provided with a series of teeth, a guide-plate forming the back of the key-way, and a sliding key provided with a corresponding series of teeth arranged to engage the teeth upon said gear, whereby as said key is inserted into the lock with a sliding motion

said gear is turned upon its axis and said bolt is moved.

4. In a lock, the combination, with a sliding bolt, of a pivoted cam engaging therewith and
5 adapted as it is turned upon its axis to move said bolt, a gear connecting with said cam, a pivoted dog forming a stop for said cam, and a sliding key provided with a series of teeth adapted to engage the teeth upon said gear,
10 whereby as said key is inserted into the lock said dog is first moved out of the path of said cam and said gear is then turned upon its axis, substantially as described.

5. In a lock, the combination, with a sliding
15 shackle-bolt and a shackle pivoted to said bolt, of a locking-bolt arranged to engage and lock said shackle-bolt, a gear provided with a suitable cam arranged to engage said locking-bolt, and a sliding key provided with a series
20 of teeth corresponding with the teeth upon said gear, substantially as described.

6. In a lock, the combination of the casing provided with the socket or opening 9, the shackle-bolt 11, arranged within said casing, the shackle pivoted to said bolt at a point
25 which is within said socket when the lock is fastened and outside of said socket when the lock is unfastened, the locking-bolt arranged to engage said sliding bolt 11, a gear provided
30 with a suitable cam arranged to move said sliding bolt as the gear is turned upon its axis, a guide-plate forming the back of the key-way, and a sliding gear provided with a series of teeth corresponding with the teeth upon
35 said gear, substantially as described.

7. In a lock, the combination, with a suitable casing provided with a circular opening or socket 9, having a beveled mouth or end, of the shackle-bolt 11, arranged within said casing, having a slot 13, engaging a stop-pin 40 12, and the shackle 2, pivoted to said bolt and having a collar 10, adapted to make a tight fit with the bevel of said socket, substantially as described.

8. In a lock, the combination, with a lock- 45 ing-bolt and a cam arranged to engage said bolt, of a gear connected with said cam, a guide-plate arranged within said casing at a distance from the center of said gear equal to the radius of said gear, and a sliding key 50 provided with a series of teeth corresponding with the teeth upon said gear.

9. In a lock, the combination, with a casing provided with an opening or socket in its wall, of a shackle, a shackle-bolt having a pivotal 55 connection with said shackle and adapted to be moved so as to bring said pivotal connection outside of said casing or within said socket, an indicating mechanism connected with said shackle-bolt, a locking-bolt adapted 60 to engage said shackle-bolt, and a cam engaging said locking-bolt, substantially as described.

In testimony whereof I have hereunto set my hand this 15th day of April, 1889.

JOHN C. BARR.

In presence of—

T. D. MERWIN,

ARTHUR P. LOTHROP.