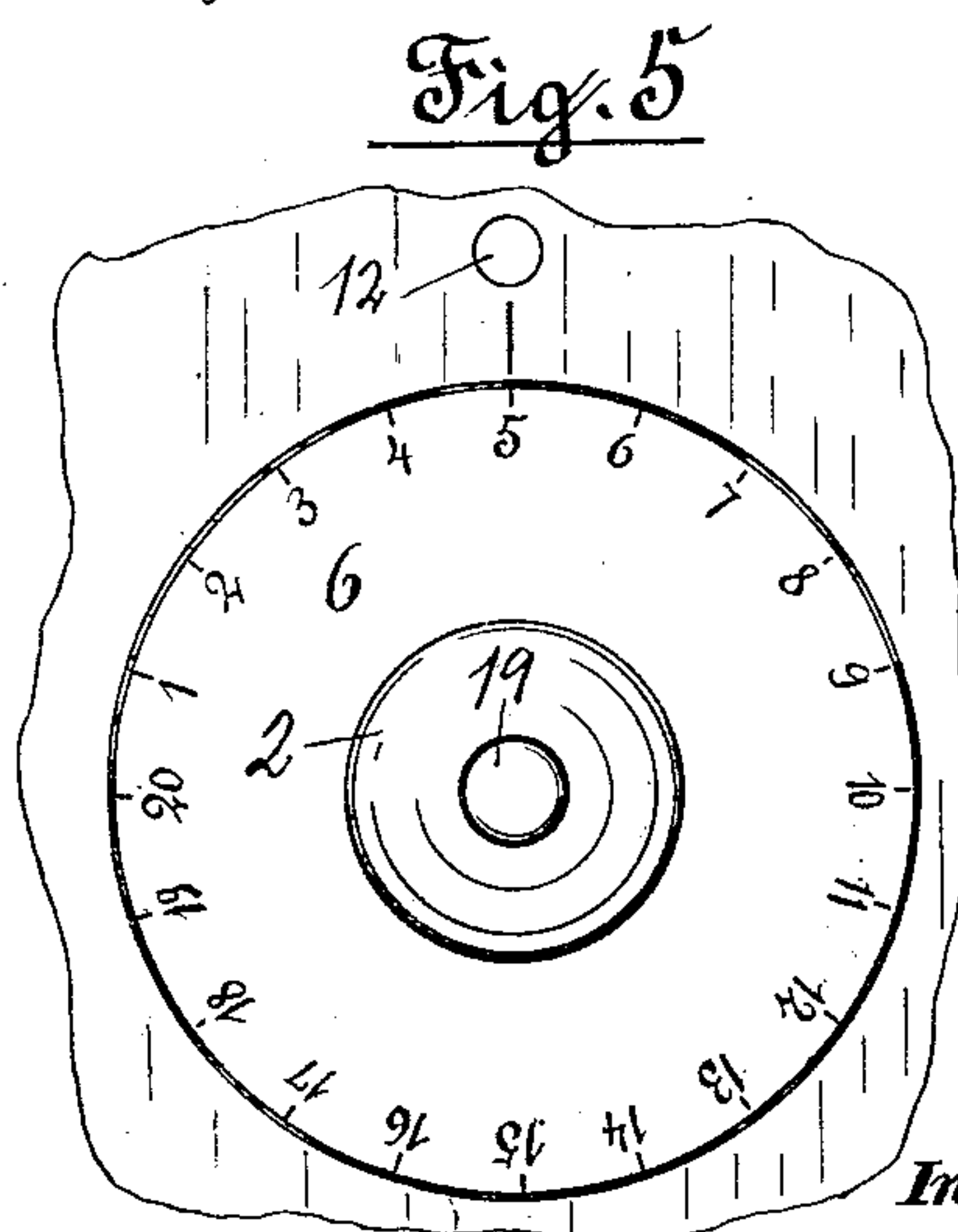
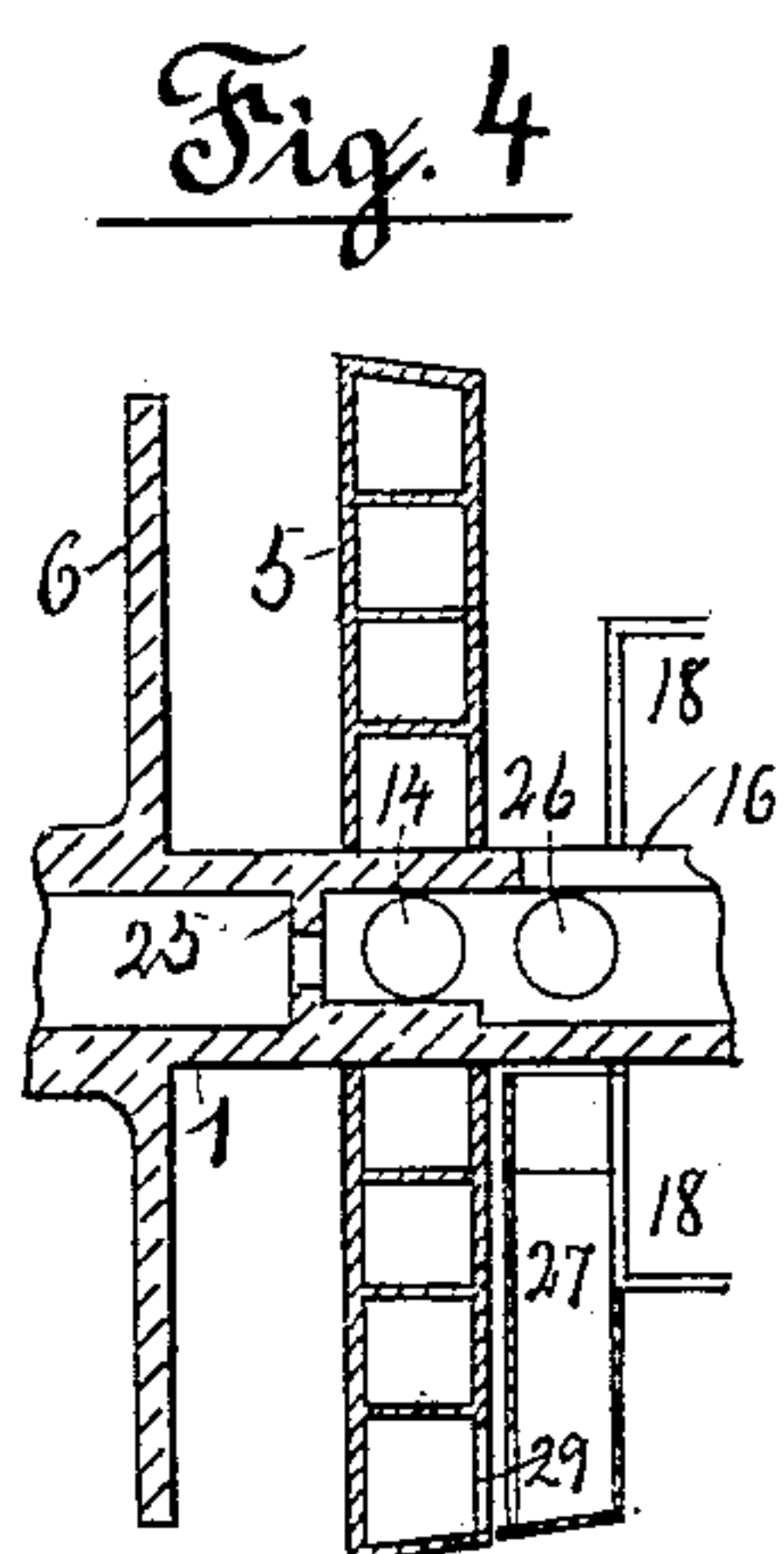
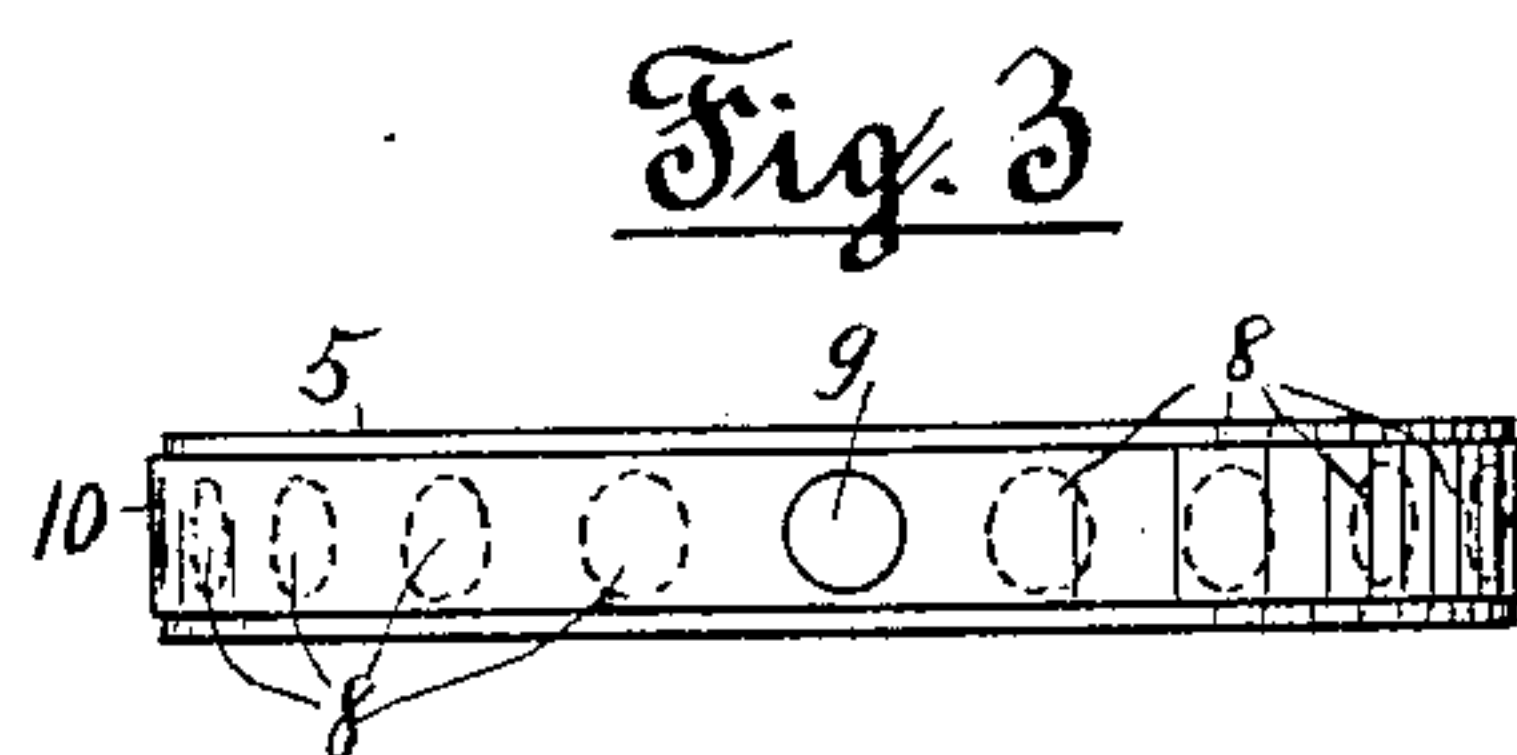
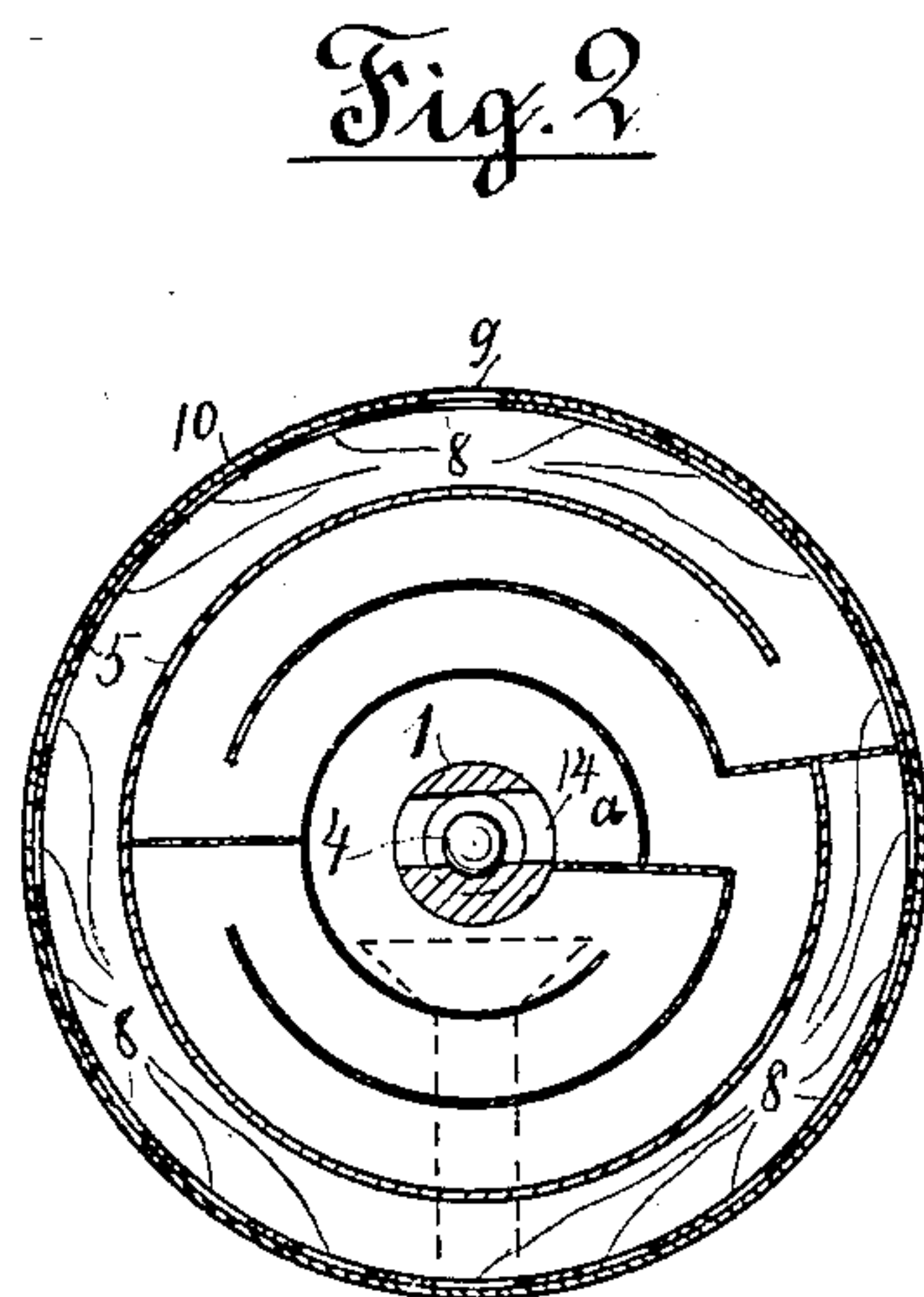
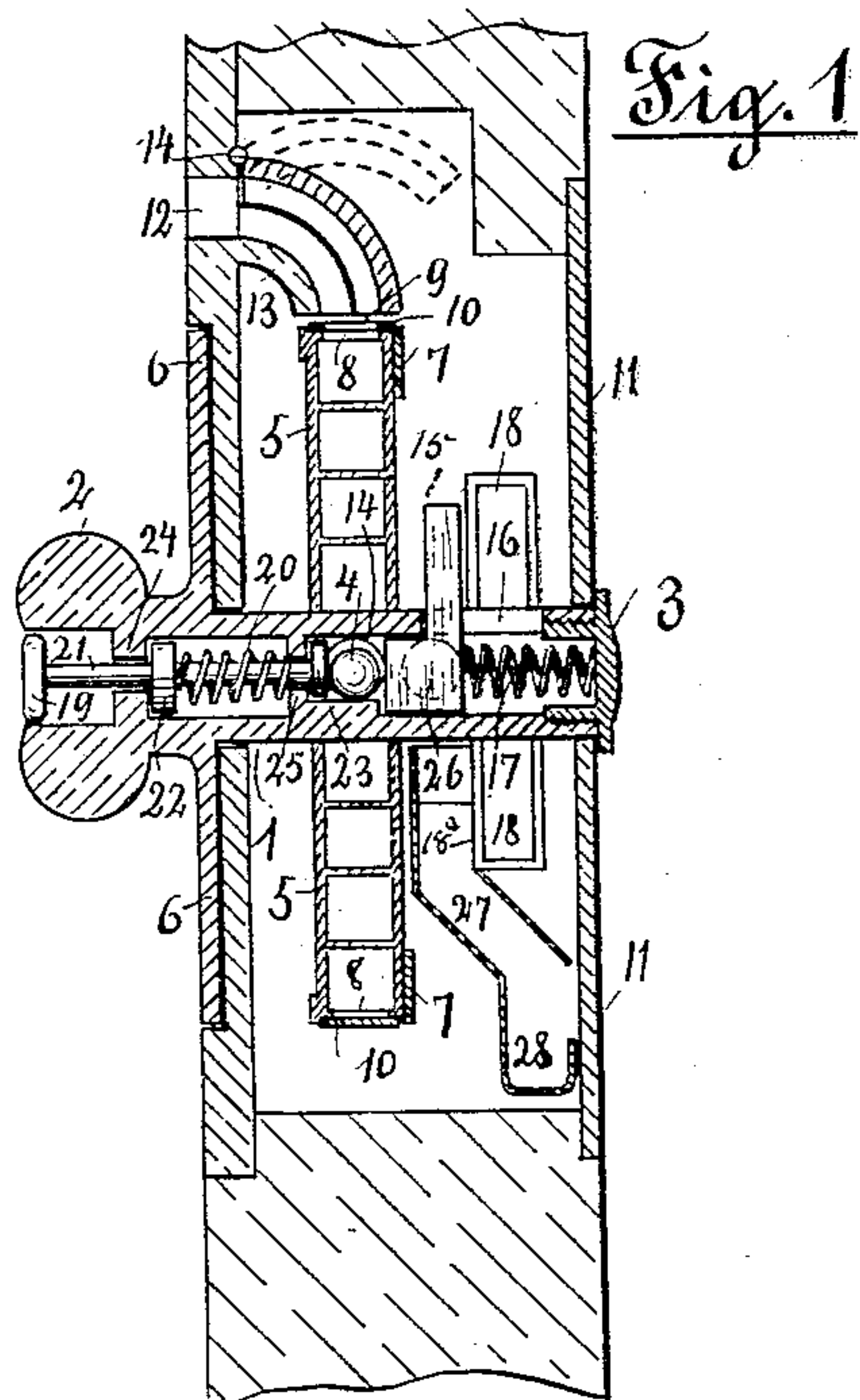


No. 735,082.

PATENTED AUG. 4, 1903.

A. FREDERIKSEN.  
CHECK CONTROLLED LOCK.  
APPLICATION FILED AUG. 7, 1902.

NO MODEL.



**Witnesses.**

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# UNITED STATES PATENT OFFICE.

ANTON FREDERIKSEN, OF COPENHAGEN, DENMARK.

## CHECK-CONTROLLED LOCK.

SPECIFICATION forming part of Letters Patent No. 735,082, dated August 4, 1903.

Application filed August 7, 1902. Serial No. 118,733. (No model.)

*To all whom it may concern:*

Be it known that I, ANTON FREDERIKSEN, a subject of the King of Denmark, residing at Copenhagen, Denmark, have invented certain new and useful Improvements in Check-Controlled Locks, of which the following is a specification.

In Letters Patent of the United States granted me on the 29th of April, 1902, No. 698,486, I have described a safety-lock in which a revoluble key-box having labyrinthine guides contains a ball and is rotated by a permanent key, so as to bring the ball into an axial passage, along which it can be moved by a plunger to unlatch a spring-pressed push-bolt which unlocks the door-bolt.

The present invention in some respects resembles the one just stated, but differs therefrom in that the ball is not permanently inclosed in the key-box or returned thereto along the axial passage, but is temporarily discharged, to be returned automatically or by hand through an exterior passage, and also in that the ball when pushed along the axial passage carries a key-bit into engagement with the bolt, either push or locking bolt, so that by continuing the rotation of the key and key-box after the positioning of the bit by means of the plunger and ball the bolt can be shot or otherwise.

In the drawings, Figure 1 is a vertical section through a safety-lock embodying my invention, showing the arrangement for inserting a ball by hand before the use of the key. Fig. 2 is a section on the line 2-2 of Fig. 1 through the rotary key-box at right angles to the previous view. Fig. 3 is a top plan view of the key-box or casing of the labyrinth. Fig. 4 represents in vertical section a modification of my apparatus wherein the ball after dropping out of the tubular key-stem is returned to the casing through an exterior conduit; and Fig. 5 is a face view of the lock, showing the key-knob, plunger-button, graduated dial, and aperture for the introduction of the ball by hand.

Referring now to said drawings, 1 indicates the tubular key-stem provided with knob 2, whereby it may be revolved with the parts it carries. The stem is secured to the lock-casing A by means of externally-threaded flanged screw-cap 3 and has fixed to it the

cylindrical key-box or labyrinth-casing 5 for the reception of ball 4 and resembling that in my aforesaid patent. A graduated and numbered dial 6 is also secured to the key-stem, fitting into a recess in the lock-casing on the side opposite that against which the flanged screw-cap takes and operating in conjunction with said cap to hold the key-stem immovable lengthwise. On the rear side of the key-box is fixed a graduated ring 7, the graduations of which correspond to those of the dial and are numbered coördinately therewith, and the peripheral wall of the key-box has perforations or openings 8, Figs. 1 and 3, one for and corresponding to each graduation of the dial and ring. All of said openings save one are normally closed by a sleeve 10, frictionally embracing the periphery of the key-box and capable of being turned thereon to cause its single aperture 9 to register with any given aperture therethrough, and consequently with any given graduation of the dial. For this purpose the rear plate 11 of the lock-casing is made removable upon unscrewing cap 3, so that the apertured sleeve may be adjusted with reference to the graduations of the ring 7, which, as aforesaid, correspond with those of the dial. The ball 4 is inserted through an opening 12 in the front plate of the lock-casing and falls down a chute or guide-tube 13 into the aperture 9 and through whichever aperture 8 of the key-box that is registered therewith, said aperture having first been brought vertically beneath the chute by turning the key-knob 2, so as to bring the corresponding designating-numeral of the dial into registry with a suitably-located index-mark. The guide-tube or chute may be divided, as shown in Fig. 1, the lower part being advisably cast integral with the front plate and the upper part hinged to the casing, so as to shut down upon or open away from the lower, thus enabling balls or other objects that stick in or choke the chute to be removed upon removing the back plate. The ball having entered the key-box is directed by definite turnings of the key-knob, depending upon the outlines of the labyrinth and the graduation of the aperture at which the ball is introduced, to the opening 14 through the tubular key-stem. This opening while of sufficient size to admit the ball



still leaves a channel along the stem sufficient to retain it if the revolution of the key and key-box ceases at the moment it enters; but if the revolution is continued without stop the ball will pass right through the stem and fall out into the key-box again and the lock will fail to be operated.

A key-bit 15, with its base confined in the tubular key-stem, is guided by a longitudinal slot 16 through the wall of said stem, being normally pressed to the front or starting end of said slot by spring 17, confined between its base and the screw-cap 3. In this position the bit can turn with the key without meeting any obstruction or engaging with any locking device; but when forced to the other end of the slot, or approximately so, it is brought into position to act upon the bolt 18 and operate the latter as the key is turned.

A plunger-pin 21, having push-button 19 at its outer end at the center of the key-knob, is arranged to play longitudinally in the key-stem and has its bearings in diaphragms 24 and 25 in the latter. Between the diaphragm 25 and a collar 22 on said pin is a coiled spring 20, which constantly urges said pin outward to retain its head 23 normally on the outer side of aperture 14<sup>a</sup>, so that the ball may be free to enter the stem. When, however, the ball is once within the stem, as indicated in Figs. 1 and 2, the button is pressed and the plunger caused to force the ball against the base of the sliding bit, carrying said bit rearward until it is alined with the bolt. Then a further turn of the key will actuate said bolt. When the plunger is released, which will be after the bit has entered between the walls of the guideway 18<sup>a</sup> for the bolt and is held from retraction thereby, the continued turning of the key will bring an opening 26 beneath the ball, and the latter will drop out of the key-stem and fall down a passage 27 into receptacle 28, whence accumulated balls may be removed from time to time by temporarily detaching back plate 11 of the lock-casing, or, as shown in Fig. 4, the passage 27 may open at its foot against the rear face of the key-box, near the periphery thereof, so as to register with an aperture 29 therethrough when said box is turned into the proper position, and thus permit the ball to be automatically restored to the box.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the key having a tubular stem longitudinally slotted near its end, a key-bit playing along said slot and guided in said stem, a spring normally forcing said bit to the front or starting end of said slot, a key-box containing a labyrinth, fixed to said stem and opening into the central bore thereof, and having an aperture whereby a ball can be introduced to the exterior way of said labyrinth, a spring-seated plunger working in the key-stem to push such ball against the bit and force the latter back against the stress

of its spring when said ball reaches and enters the stem, and a bolt with which said bit alines when thus forced back.

2. The combination of the key having a tubular stem longitudinally slotted near its end, a key-bit playing along said slot and guided in said stem, a spring normally forcing said bit to the front or starting end of said slot, a key-box containing a labyrinth, fixed to said stem and opening into the central bore thereof, and having an aperture whereby a ball can be introduced to the exterior way of said labyrinth, a spring-seated plunger working in the key-stem to push such ball against the bit and force the latter back against the stress of its spring when said ball reaches and enters the stem, a bolt with which said bit alines when thus forced back, and a passage into which the ball drops from the key-stem when the bit is engaged.

3. The combination of the key having a tubular stem longitudinally slotted near its end, a key-bit playing along said slot and guided in said stem, a spring normally forcing said bit to the front or starting end of said slot, a key-box containing a labyrinth, fixed to said stem and opening into the central bore thereof, and having an aperture whereby a ball can be introduced to the exterior way of said labyrinth, a spring-seated plunger working in the key-stem to push such ball against the bit and force the latter back against the stress of its spring when said ball reaches and enters the stem, a bolt with which said bit alines when thus forced back, a passage into which the ball drops from the key-stem when the bit is engaged, a receptacle for the accumulation of balls to which said passage delivers and a removable plate in the lock-casing to give access to said receptacle.

4. The combination of the key, having a tubular stem, the key-box secured to and opening into the key-stem, inclosing a labyrinth, and having an aperture through its periphery giving access to the exterior of the labyrinth, a chute leading from the exterior of the lock-casing to a point where it may register with said opening and deliver a ball thereto, a plunger playing in the key-stem, to force the ball therealong when introduced therein, a bolt, and means for shooting said bolt, intermediately actuated by the ball when forced onward by the plunger.

5. The combination of the key, having a tubular stem, the key-box secured to and opening into the key-stem, inclosing a labyrinth and having a peripheral series of apertures giving access to the exterior way of the labyrinth, a dial graduated and numbered to correspond with the peripheral openings of the box and revoluble with said box, a chute leading from the exterior to close proximity with the periphery of the box for delivering a ball thereto, a sleeve embracing said periphery frictionally so as to be slipped thereabout, and having a single aperture to be brought into register with any given open-



ing through the periphery while the sleeve closes the remainder, means for pushing the ball outward when deposited in the tubular stem, a bolt, bolt-shooting devices brought  
5 into operation by said ball when so pushed onward, a passage into which said ball drops at the extreme of its onward movement, and a receptacle to which said passage delivers.

6. The combination of the key having a tubular stem, the key-box secured to said stem, inclosing a labyrinth and having a peripheral series of apertures, a sleeve frictionally embracing the periphery of the box so as to be slipped thereabout and having a single aperture to be brought into registry with any  
15 given opening through said periphery, the lock-casing, a conduit leading from the front of said casing, the dial resting upon the front plate of the casing, revolving with the key-box and graduated and numbered to correspond with the openings through the periphery thereof, the correspondingly graduated

and numbered ring secured to the rear of the box adjacent to its periphery, and means detachably securing the back plate of the lock-  
25 casing, whereby the adjustment of the sleeve, with respect to the openings may be determined both as to the ring and the dial.

7. In combination with the key having a tubular stem, and the peripherally-apertured  
30 key-box containing a labyrinth for directing a ball to an opening in said stem, a lock operated by the conjoint action of said key and ball, and the bipartite chute for delivering a ball to the labyrinth, and the upper section  
35 of which is hinged to open away from the other, to prevent choking.

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

ANTON FREDERIKSEN.

Witnesses:

HANS PEDERSEN,

CHRISTIAN AUGUST SÖRENSEN.