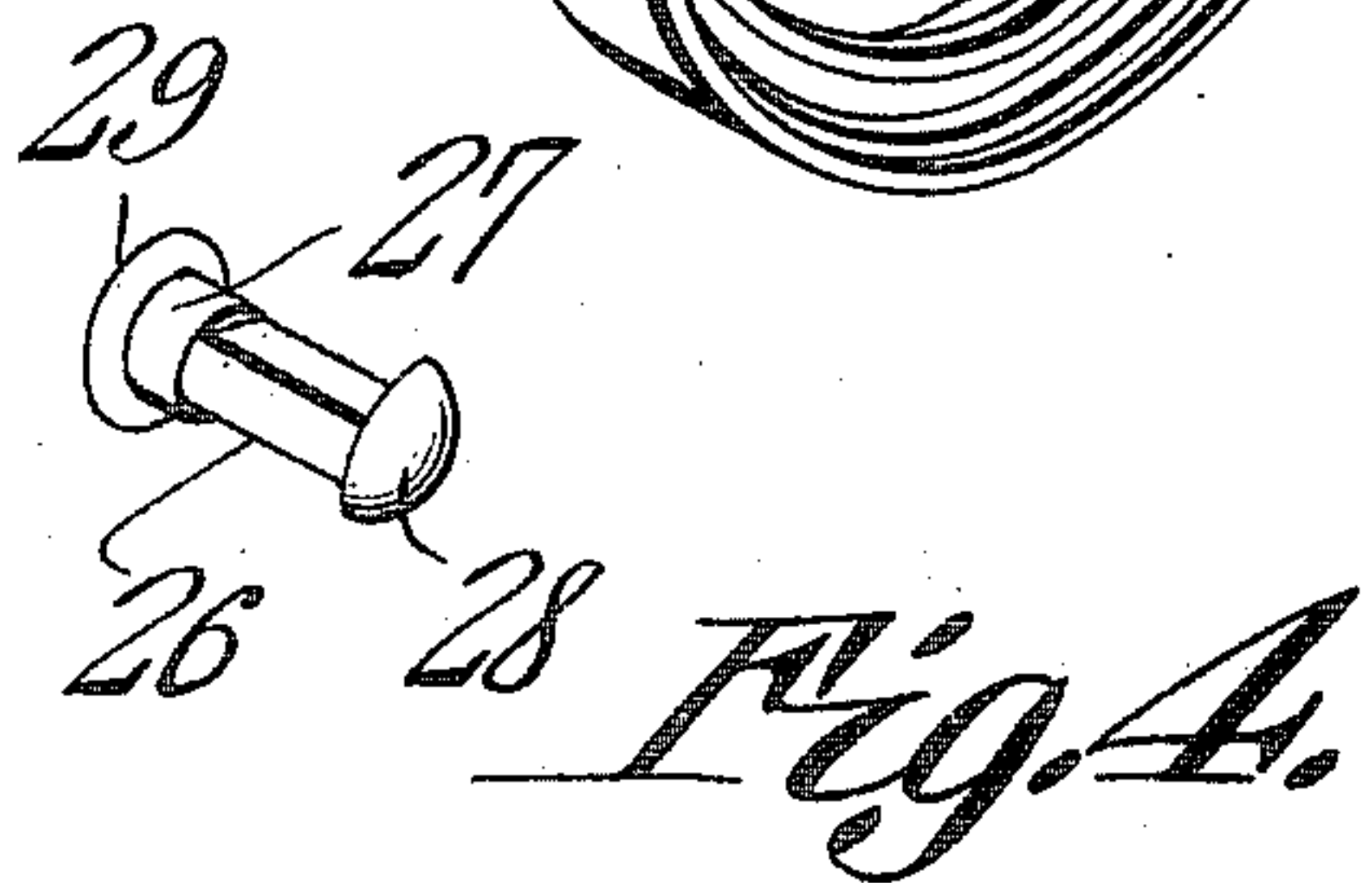
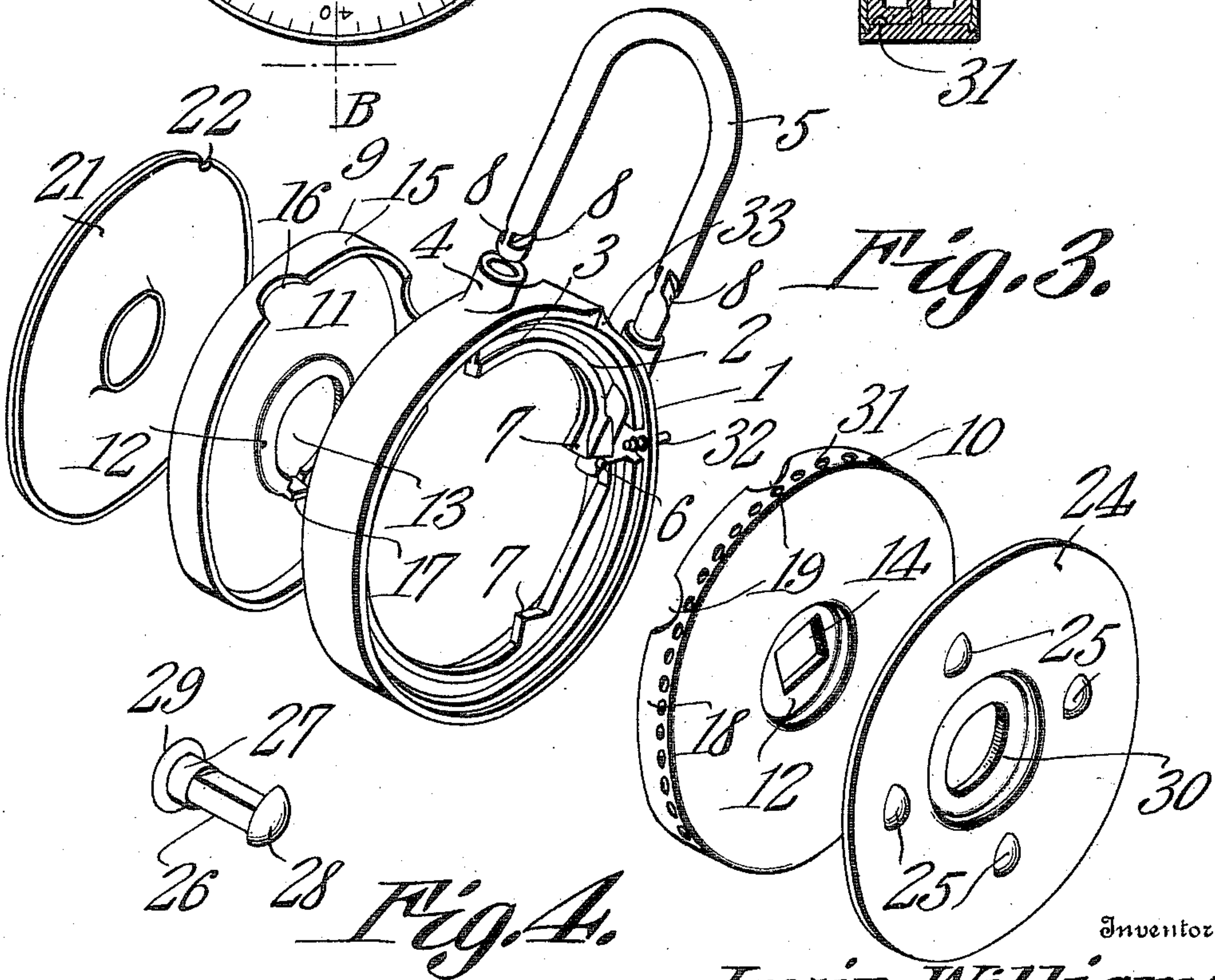
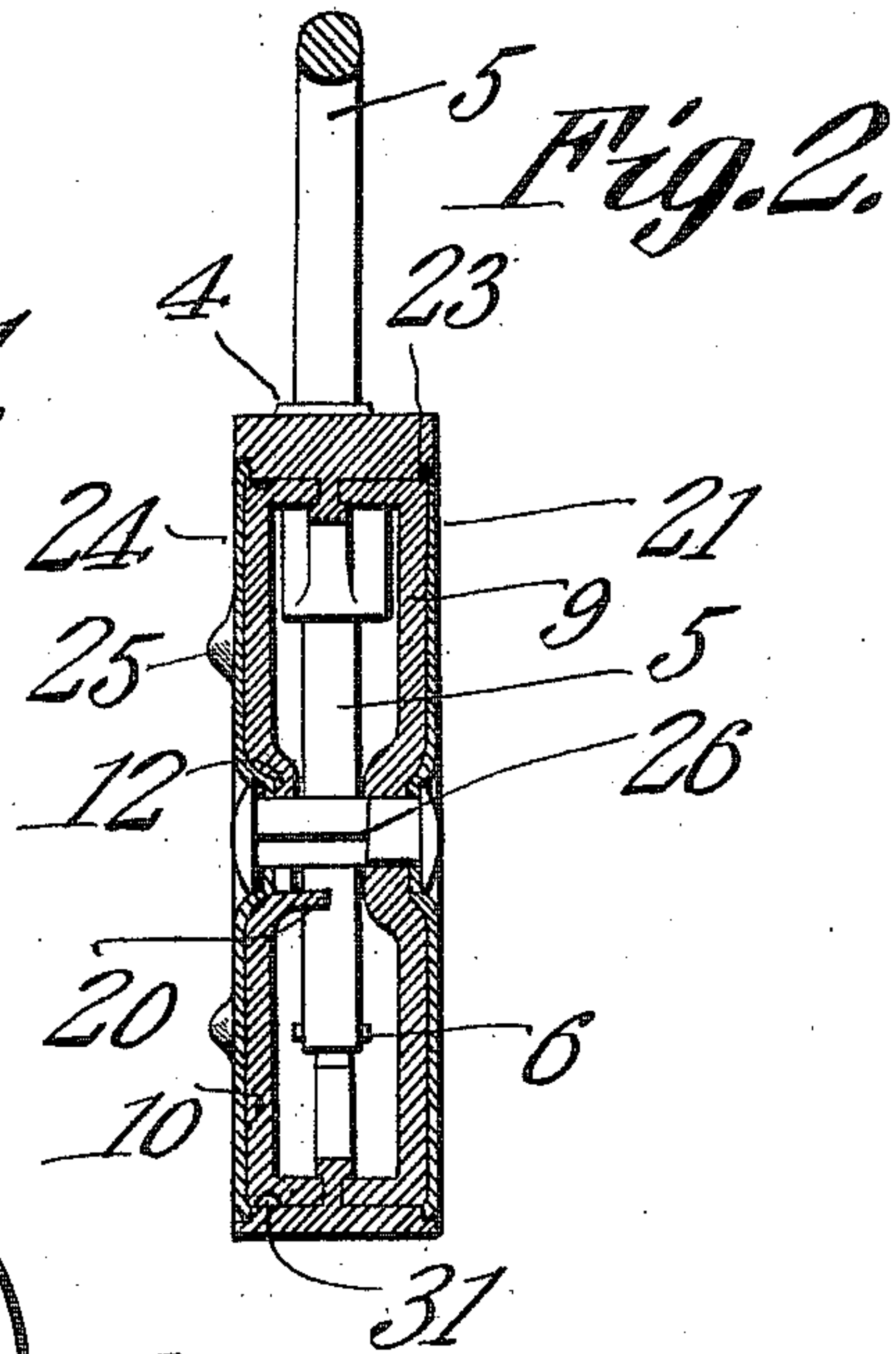
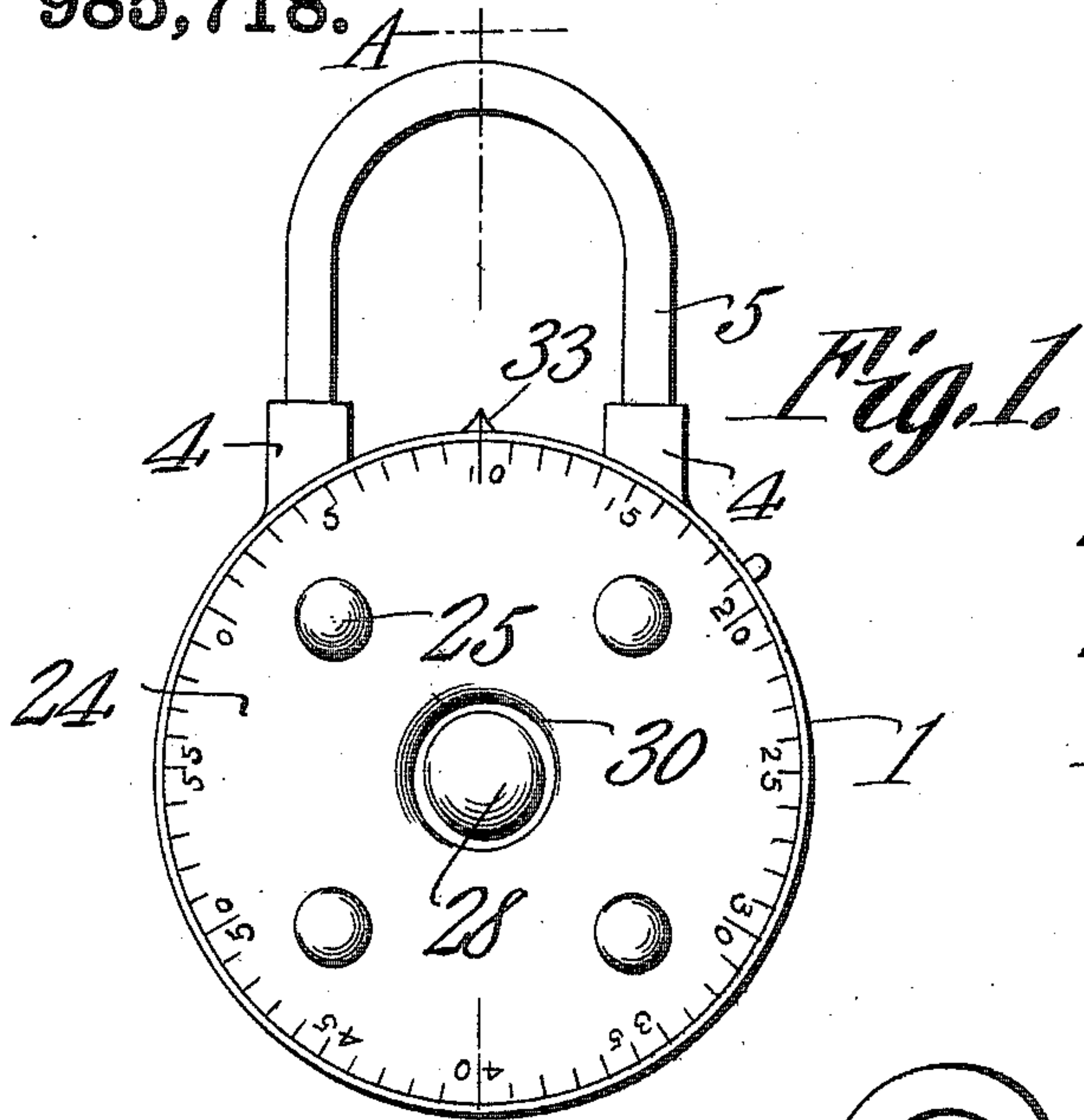


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PERMUTATION PADLOCK.
APPLICATION FILED NOV. 19, 1909.

985,718.

Patented Feb. 28, 1911.



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IRVIN WILLIAMS, OF MARSHALL, MISSOURI; D. D. DUGGINS ADMINISTRATOR OF SAID
IRVIN WILLIAMS, DECEASED.

PERMUTATION-PADLOCK.

985,718.

Specification of Letters Patent.

Patented Feb. 28, 1911.

Application filed November 19, 1909. Serial No. 528,926.

To all whom it may concern:

Be it known that I, IRVIN WILLIAMS, a citizen of the United States, residing at Marshall, in the county of Saline and State of Missouri, have invented a new and useful Permutation-Padlock, of which the following is a specification.

This invention has reference to improvements in permutation padlocks and its object is to provide a lock of this type which is of simple construction and cheaply made and in which the combination may be readily changed at the will of the possessor.

In accordance with the present invention there is provided a suitable casing with front and back plates housing and concealing the working parts of the structure and one of these plates is made rotatable and is provided with an index so that the permutation members may be moved to the proper position to release the lock members. The index member is made to engage a corresponding permutation member by friction only so that on the application of a suitable force when the corresponding permutation member is held against movement, the index plate may be changed with relation to the permutation member controlled thereby, to thus change the combination, but the relation between the permutation members remains always the same so that the possessor on changing the combination will know that the second number of the combination will have a certain definite relation to the first number.

The invention will be best understood from a consideration of the following detail description taken in connection with the accompanying drawing forming a part of this specification, in which drawings,

Figure 1 is a face view of the lock from the index side. Fig. 2 is a section on the line A—B of Fig. 1. Fig. 3 is a displayed view of the lock with the several members in separated relation. Fig. 4 is a perspective view of the connecting rivet or stem.

Referring to the drawings there is shown an annular casing 1, provided with an interior, centrally located, and inwardly directed rib 2, grooved on opposite sides as indicated at 3. The casing 1 is provided at appropriate points with hollow bosses 4 for the passage of a shackle 5 which is, in the present case shown of U-form so that when withdrawn, the shackle may be turned on

one arm thereof as a pivot, such arm being longer than the other and retained in the casing by a stop pin 6 or otherwise. The passages through the bosses 4 communicate with the interior of the casing 1 through suitable passages traversing the rib 2 and the limit of movement of the shackle into the casing may be limited by off-sets or shoulders 7 at appropriate points on the rib 2. The shackle 5 is provided at appropriate points on opposite sides with recesses 8 adapted, when the shackle is in the closed position to match the grooves 3 in the rib 2 for a purpose which will presently appear.

Within the casing 1 on opposite sides of the rib 2 are permutation members 9 and 10 respectively, these members each comprising a central web 11 inset near the center to form a hub 12 on one side through which hub there is a central opening made circular, as shown at 13, for the member 9 and square or other non-circular shape, as shown at 14, for the member 10. The member 9 has projecting from one face a peripheral flange 15 concentric with the axis of rotation of said member 9 and provided with spaced notches 16 matching the passages through the rib 2 provided for the members of the shackle 5. The hub 12 has projecting therefrom on the face of the member 9 provided with a flange 15, a tongue 17 for a purpose which will presently appear. The member 10 has a peripheral annular flange 18 similar to the flange 15 of the member 9 and this flange 18 has notches 19 like the notches 16 of the flange 15 and similarly located. The hub 12 of the member 10 has a projecting finger 20 like the finger 17 of the member 9 and so located with reference to the notches 19 that when the finger 20 is in engagement with the finger 17, these fingers being in the path one of the other when the parts are assembled, the notches 16 and 19 will be brought in matching relation, when the finger 20 is on the proper side of the finger 17 and these notches may then be brought into coincidence with the passages for the members of the shackle 5.

Overlying the member 9, exterior thereto is a plate 21 constituting the back plate of the lock, and this plate is provided with a stud 22 adapted to engage in a recess 23 in the corresponding edge of the casing 1 so that when the parts are properly assembled the back plate 21 is held against rotation by

the engagement of the stud 22 in the recess 23. There is also provided a front plate 24, the inner face of which is in frictional engagement with the outer face of the member 10 when the parts are properly assembled. The casing 1 is formed with suitable rabbets for the reception of the front and back plates so that the assembled lock presents a neat appearance. The outer face of the front plate 24 is provided with a circular series of studs or bosses 25 to facilitate the rotation of the plate 24 by the hand of the user.

The several members of the lock are held in assembled position by a center pin 26 having a cylindrical portion 27 where it passes through the back plate 21 and the permutation member 9, while the remainder of the pin 26 may be of square cross section to match the square opening 14 in the permutation member 10. The end of the pin 26 extending through the plate 24 may be headed as indicated at 28 after the parts are assembled, the pin being provided at the other end with a head 29 to engage the outer face of the back plate 21 which latter may be dished at the center so that the head 29 does not extend beyond the outer face of the said plate. The front plate 24 may be also dished as indicated at 30 for the reception of the head 28 so that the front end of the pin 26 may not project beyond the outer face of the plate 24. The pin is made to grip the front and back plates sufficiently to hold the members together but not to prevent the turning of the pin in the back plate when a movement of rotation is imparted to the front plate 24 and from the latter is transmitted to the permutation member 10 because of the large area of frictional engagement between the plate 24 and the member 10.

When the shackle 5 is in the innermost position the recesses 8 coincide with the grooves 3 in the rib 2 and the flanges 15 and 18 are seated in corresponding recesses or grooves 3 in the said rib 2 and also seat in the recesses 8 in the shackle thus locking the same against withdrawal until the notches 16 and 19 are brought into coincidence with the two members of the shackle so that the latter may then be freely withdrawn from the locked position to the unlocked position when the shorter leg of the shackle is free from the corresponding boss 4 and the shackle may be turned upon the longer leg as a pivot as is customary in locks of this character.

Around the periphery of the member 10 there is formed a circular series of notches 31 and mounted in the casing 1 is a pin 32 having one end normally projecting beyond the periphery of the casing and the other end shaped to engage the notches 31 when the pin is pushed into the casing for a sufficient distance. The pin may be normally

under the control of a spring tending to project the outer end beyond the casing within reach of a finger of the operator.

To unfasten the lock the front plate or dial is turned in the proper direction, say to the left or counter clock-wise one or two revolutions and is finally stopped at the proper combination number, the latter then being opposite an indicating mark shown at 33 in Figs. 1 and 3. In this position of the parts the lug or finger 20 has engaged the lug or finger 17 and the lock member 9 has been turned until the notches 16 are coincident with the passages through the rib 2 for the shackle 5. The dial 24 is now turned to the right, or clockwise, until the selected combination number is opposite the indicator 33, this movement carrying the lock member 10 with the dial until the notches 19 are opposite the notches 16 thus releasing the shackle which may be withdrawn to the unlocked position. Because of the square part of the pin or rivet 26 and the square opening through the lock member 10, the rivet will always participate in the movement of the dial plate 24 in either direction of rotation thereof. Since there are two permutation members in the lock there will always be the same relative movement between them whatever be the first number of the combination. This relative movement may be different in different locks but will always be the same in the same lock. Should the combination be changed by some unauthorized person then the owner of the lock may find the first number of the combination by "feel" and then the second number of the combination will be removed a definite distance from the first number. If the first number be 30 and the second number 50, then if the first number be changed by moving the dial 24 with relation to the lock member 10, the second number will always be 20 more than the first number. If the movement of the permutation members be in the contrary direction, then the second number will be removed from the first number by 20 as before. These differences will vary with different locks. If the attempt be made by the owner to open the lock in the dark, the first position may be ascertained by feel and then the pin 32 may be depressed so as to engage the notches 31, and on the reversed movement of the dial the necessary movement may be ascertained by the engagement of the pin in the proper number of successive notches without necessity of viewing the dial.

To change the combination it is only necessary to hold the lock member 10 against rotation and by the application of a suitable force to rotate the dial member 24 to the desired extent in the proper direction. Should it happen that by continued use the dial member becomes loose upon the rivet or pin

26 then the latter may be reriveted to the necessary extent to again tighten the parts so that the dial member 24 will not move independently of the lock member 10 in the ordinary operation of the lock.

What is claimed is:

1. A lock comprising a casing having a central annular rib or flange therein with annular grooves on opposite sides, a shackle with recesses matching the grooves in the flange when the shackle is in the innermost position, rotatable permutation lock members each having a flange adapted to a respective groove in the rib in the casing and also having notches for the passage of the shackle, and each provided with a finger projecting into the path of the finger of the other permutation lock member, and a dial plate frictionally engaging one of the permutation members for turning the latter with said dial.

2. A permutation lock member comprising a suitable casing, a shackle provided with locking recesses, rotatable permutation members provided with locking flanges for the

shackle, said flanges having releasing notches therein, a dial plate operatively engaging one of the rotatable members by friction, the said dial plate and the other one of the permutation members having central circular openings therethrough and the permutation member engaged by the dial plate having a non-circular opening there-through, each permutation member having an integral engaging finger in the path of the like finger of the other member, and a connecting pin traversing the openings through the permutation members and the dial plate and having a non-circular portion matching and extending through the non-circular opening in the permutation member engaged by the dial plate.

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

IRVIN WILLIAMS.

Witnesses:

G. W. NEWTON,
ABIEL LEONARD.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
