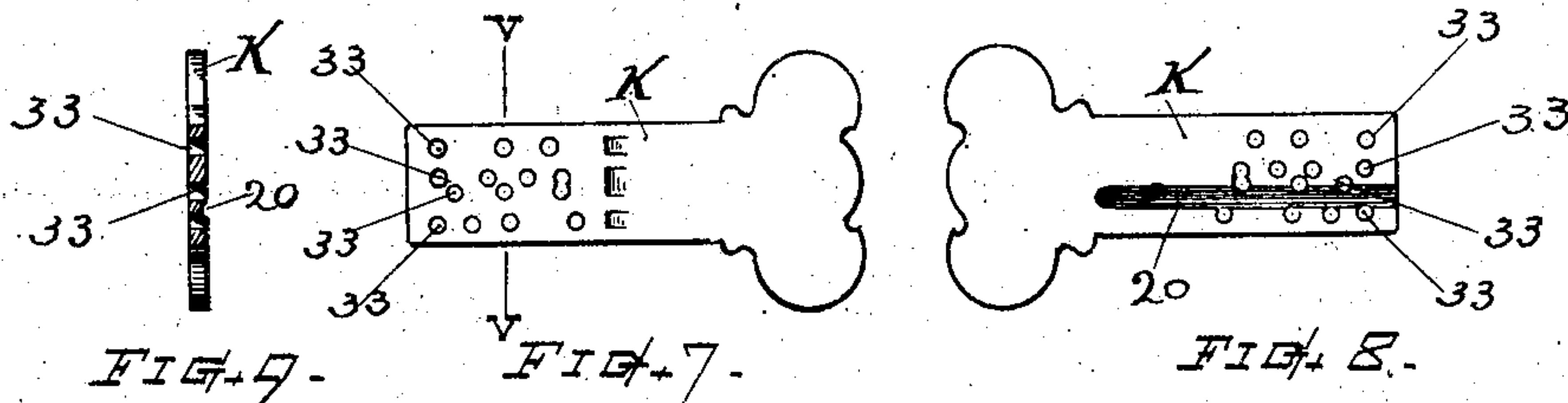
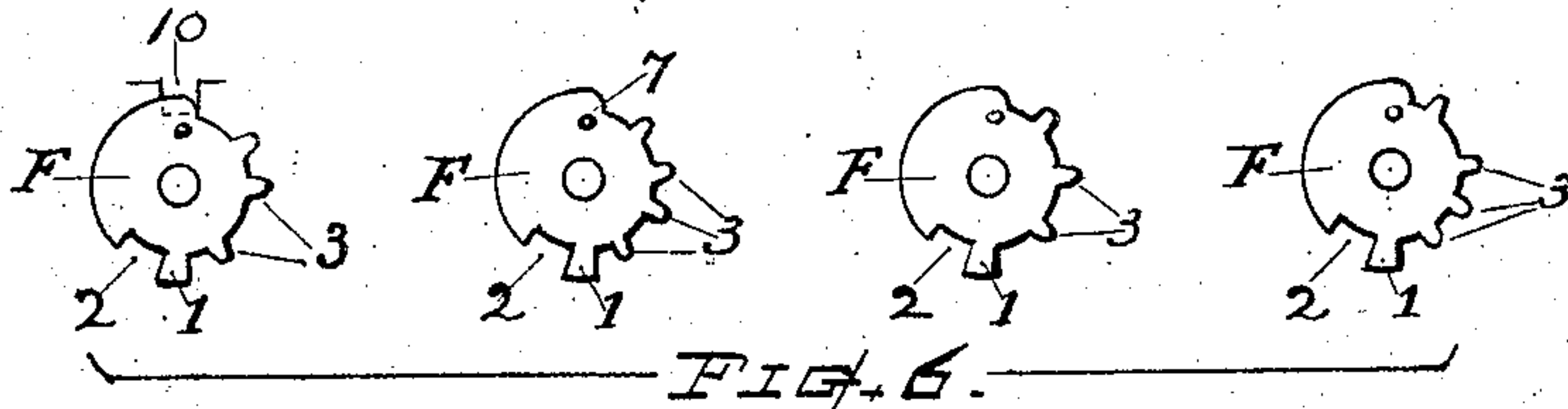
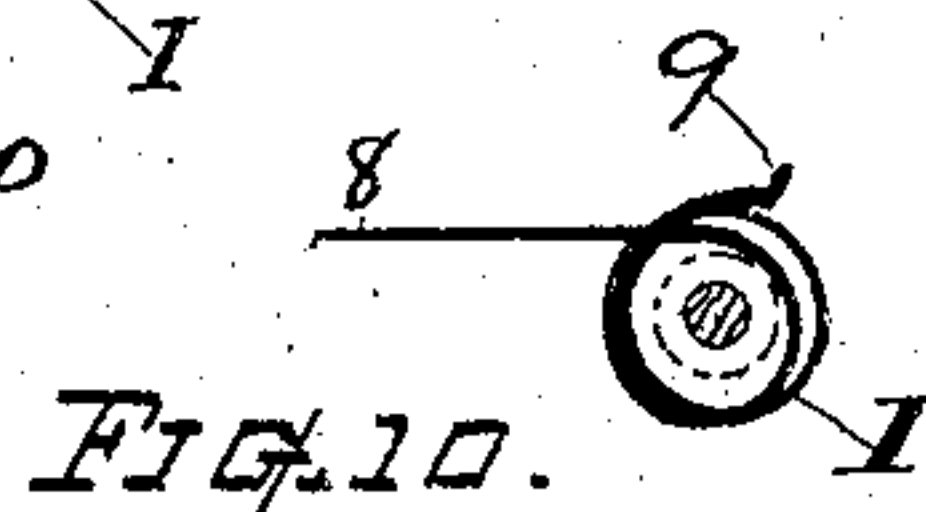
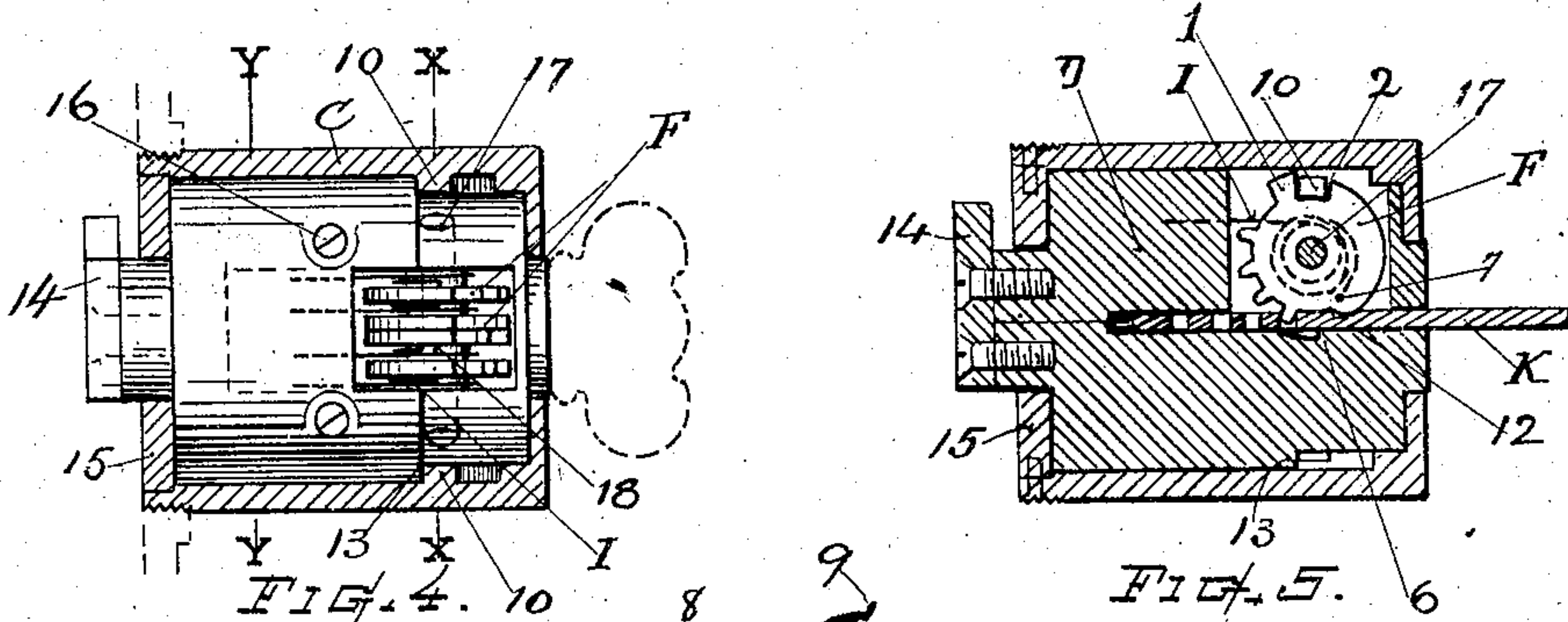
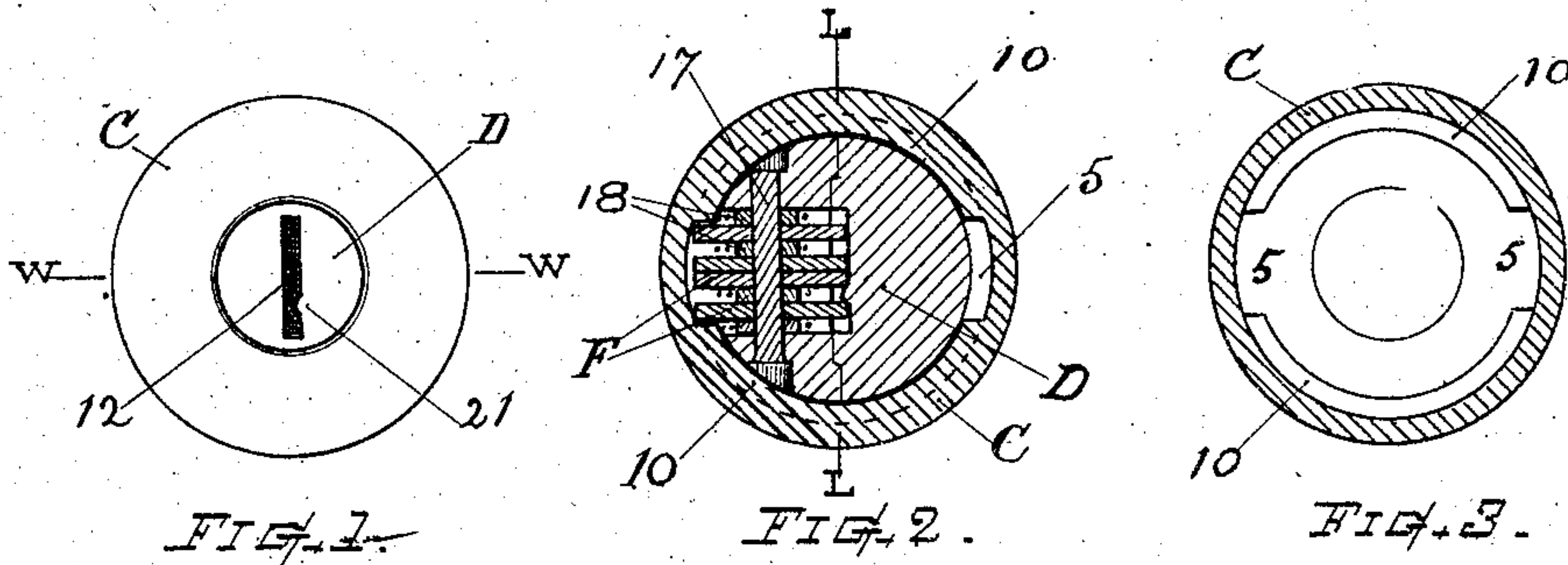


No. 834,918.

PATENTED NOV. 6, 1906.

P. K. LINDGREN.  
CYLINDER LOCK AND KEY THEREFOR.  
APPLICATION FILED JAN. 23, 1906.



Witnesses.

Charles A. Bacon  
Fred H. Elmer

FIG. 11.

Inventor.

Paul K. Lindgren  
By Chas. H. Durlough  
Attorney.



# UNITED STATES PATENT OFFICE.

PAUL K. LINDGREN, OF WORCESTER, MASSACHUSETTS.

## CYLINDER-LOCK AND KEY THEREFOR.

No. 834,918.

Specification of Letters Patent.

Patented Nov. 6, 1906.

Application filed January 23, 1906. Serial No. 297,430.

*To all whom it may concern:*

Be it known that I, PAUL K. LINDGREN, a subject of the King of Sweden, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improved Cylinder-Lock and Key Therefor, of which the following is a specification, reference being made therein to the accompanying drawings.

The object of my present invention is to provide a cylinder-lock of novel construction which will afford a large variety of different forms, with a construction of similar principle and mode of operation in which a series of rolling disk tumblers having teeth and notches are arranged to cooperate with a key having recesses therein adapted for working the tumblers as the key is inserted and withdrawn, as more fully hereinafter explained. I attain this object by the mechanism explained in the following detailed description and illustrated in the accompanying drawings, wherein—

Figure 1 is a front view. Fig. 2 is a transverse section through the mechanism at the position of the line X X on Fig. 4. Fig. 3 is a transverse section of the cylinder only at the position of line Y Y on Fig. 4 looking forward. Fig. 4 is a longitudinal section of the cylinder at line L L and a side view of the interior parts. Fig. 5 is a longitudinal central section on line W W, Fig. 1. Fig. 6 shows side views of the several tumblers. Figs. 7 and 8 show opposite side views of the key. Fig. 9 is a cross-section of the key at line V V. Fig. 10 is a separate view of the tumbler-spring, and Fig. 11 a separate side and edge view of the tumbler-washer.

My improved cylinder-lock comprises a cylindrical shell C, having an annular facing-head and an interior projecting flange 10, formed in segments integral with the cylinder and having spaces 5 between the ends of the segments which terminate with shoulders, as best shown in Figs. 2 and 3.

The cylinder at its rear end is externally fitted with a screw-thread or other suitable means for attaching and holding it non-rotatable and secure at any position where it is to be used, as in connection with the frame of a door-latch mechanism or bolt mechanism, which mechanism being no part of my present invention is not herein shown.

Within the cylinder there is arranged a rotatable body or holder D, having a longitu-

dinal key-seat 12 therein open from the front end, which holder is fitted with a shoulder that extends through the central opening in the cylinder-face, and a second shoulder or offset 13, that fits adjacent to the internal segment-flange 10, also with a reduced portion at its rear end which extends beyond the end of the cylinder and has attached thereto a detent 14 or any suitable means for throwing a latch or bolt. (Not shown.)

The holder or body D is rotatably confined within the cylinder by an annular head 15, secured in the rear end of the cylindrical shell by pins, screws, or other suitable fastening means. The holder is preferably formed of two halves secured together by rivet-pins or screws 16. Within one-half of the holder-body there is a recess within which I arrange a series of flat disk tumblers F, in the present instance four, and indicated in their order in Fig. 6 from left to right as corresponding with their order from top to bottom in the other figures. Said tumblers are disposed in planes perpendicular to the plane of the key-seat. They are mounted to revolve about an axis-pin 17, located with its axis in the plane of the internal flange 10 and parallel with the plane of the key-seat 12. The gang of tumblers F approximately corresponds in width with the dimension of the spaces 5 between the ends of the flange-segments 10, and the diameter of the tumbler-disks equals approximately the distance from the bottom of the key-seat to the inner face of the cylinder. Washers 18, Fig. 11, are arranged on the axis-pin to keep the tumblers in proper position.

The tumbler-disks are made substantially as shown in Fig. 6, each provided with a central opening to fit the axis-pin, a plain circle formed at one side and a series of detents or cogs 3, with intervening recesses equal to the depth of the key-plate and of varying width, at the other side. Each tumbler has a similar releasing-recess 2, of suitable form and area to accommodate the cross-section of the flange 10 and also a tooth 1 adjacent to said recess of somewhat greater radial length than other parts of the disk. This tooth by contact with a lug 6 on the body D stops the several tumblers in uniform alinement at their primary position. A part of the tumbler-disk at its plain circular periphery normally stands across the plane of the flange 10 when the tumblers are at normal position. This



locks the parts and prevents rotation of the holder within the cylinder until the tumblers are rotated to bring their space 2 into line with said flange.

5 The tumblers are each provided with a spring I of fine wire (see Fig. 10) disposed in a coil about the axle-pin and having one end 8 inserted in a suitable hole formed in the holder-body and the other end 9 offset and  
10 inserted in a hole 7 in the tumbler-disk. The action of the spring tends to revolve the tumbler backward to its primary position. The edge of the tumblers runs close to the bottom of the key-seat, so that a thin flat piece, other  
15 than the key, cannot be inserted beneath them.

The key K is formed as a flat plate about one-sixteenth of an inch thick, more or less, fitted to enter the key hole or seat 12 longitudinally of the cylinder in alinement with and  
20 substantially tangential to the circle of the tumbler-disks, the flat plate of the key being perpendicular to the planes of the tumbler-disks. The key is provided with rows of  
25 holes or recesses 33, formed therein, each row corresponding to one of the tumblers and having its holes spaced for receiving the points or detents 3 of its particular tumbler. The side of the key is preferably provided with a  
30 groove 20, one or more, to match a ward 21, formed on the holder at one side of the key-hole, so that the key can be inserted only in one relative position.

In the operation when the key is inserted  
35 into the keyhole or key-seat the recesses and detents engage and as a rack and gear cause the partial rotation of the tumblers, so as to bring the tumbler-spaces 2 into alinement with the circle of the segment-flange 10, thus  
40 unlocking the holder, so that it can be freely revolved within the cylinder, and thereby through the medium of the connection at 14 operating any latch or bolt mechanism in connection with which this lock may be em-  
45 ployed. Since there are spaces 5 in the flange 10 at opposite sides of the cylinder, the key can be inserted and withdrawn when the gang of tumblers is coincident with either of said spaces. When the key is withdrawn,  
50 the tumblers roll back to their first position with their long detent 1 against the stop-lug 6, where they are held by the springs I.

Any convenient number of tumblers F may be employed in the gang, each operating as  
55 specified, and the points 3 on the several tumblers can be located on different radials and in different numbers for the several tumblers, the holes or recesses in the respective keys therefor arranged to correspond with  
60 the arrangement on the tumblers used in any particular instance. Thus locks of varied combination or individuality in great variety can be produced.

I claim and desire to secure by Letters Patent—

1. In a lock mechanism, the cylinder having the internal segment-flange, in combination with the revoluble holder or body fitting within said cylinder and having a longitudinal key-seat; a plurality of rotatable disk  
65 70 tumblers mounted in said holder upon an axis-pin and in alinement for engaging said segment-flange, said tumblers having peripheral detents and recesses, and means insertible into said key-seat for rotating said tumblers, substantially as and for the purpose set forth.

2. In a lock mechanism, the combination substantially as described, of the cylinder having an internal flange with spaces and  
80 shoulders for the reception of locking-tumblers, a rotatable body or holder confined within said cylinder and having a flat keyway therein, and provided with means for moving a latch or bolt, a gang of rotatable disk tumblers pivotally supported within a recess in  
85 said holder between the keyway and cylinder-shell and engageable with said segment-flange, said tumblers provided with variously-arranged detents and a releasing-recess, and a  
90 key provided with holes or recesses therein that coact with the detents for actuating the tumbler to bring the releasing-recess of each tumbler into alinement with the flange when the key is inserted into said keyway.

3. The combination as described, of the cylinder having an annular facing-flange, and an internal flange with spaces therein, the holder rotatable within said cylinder, means for confining said holder in the cylinder, the  
100 detented tumblers mounted in said holder and engaging the segment-flange, the axis-pin for said tumblers, washers on said pin adjacent to the tumblers, return-springs for the respective tumblers, and a key having rows  
105 of tumbler-engaging recesses conforming to the detents of the several tumblers.

4. In a cylinder-lock mechanism of the character described, in combination with the cylinder having internal tumbler-arresting  
110 shoulders, and the rotatable disk tumblers provided with peripheral detents and recesses as set forth, of the rotatable holder formed in two half-sections with an intermediate longitudinal keyway, one of said half-sections provided with a recess in which the tumblers are  
115 arranged with their planes perpendicular to the plane of said keyway, a transverse pivot-pin for said tumblers, and means for securing the half-sections to each other.

Witness my hand this 20th day of January, 1906.

PAUL K. LINDGREN.

Witnesses:

CHAS. H. BURLEIGH,  
ELLA P. BLENUS.