

(No Model.)

J. P. WEBER.  
PERMUTATION LOCK.

No. 565,527.

Patented Aug. 11, 1896.

Fig. 1.

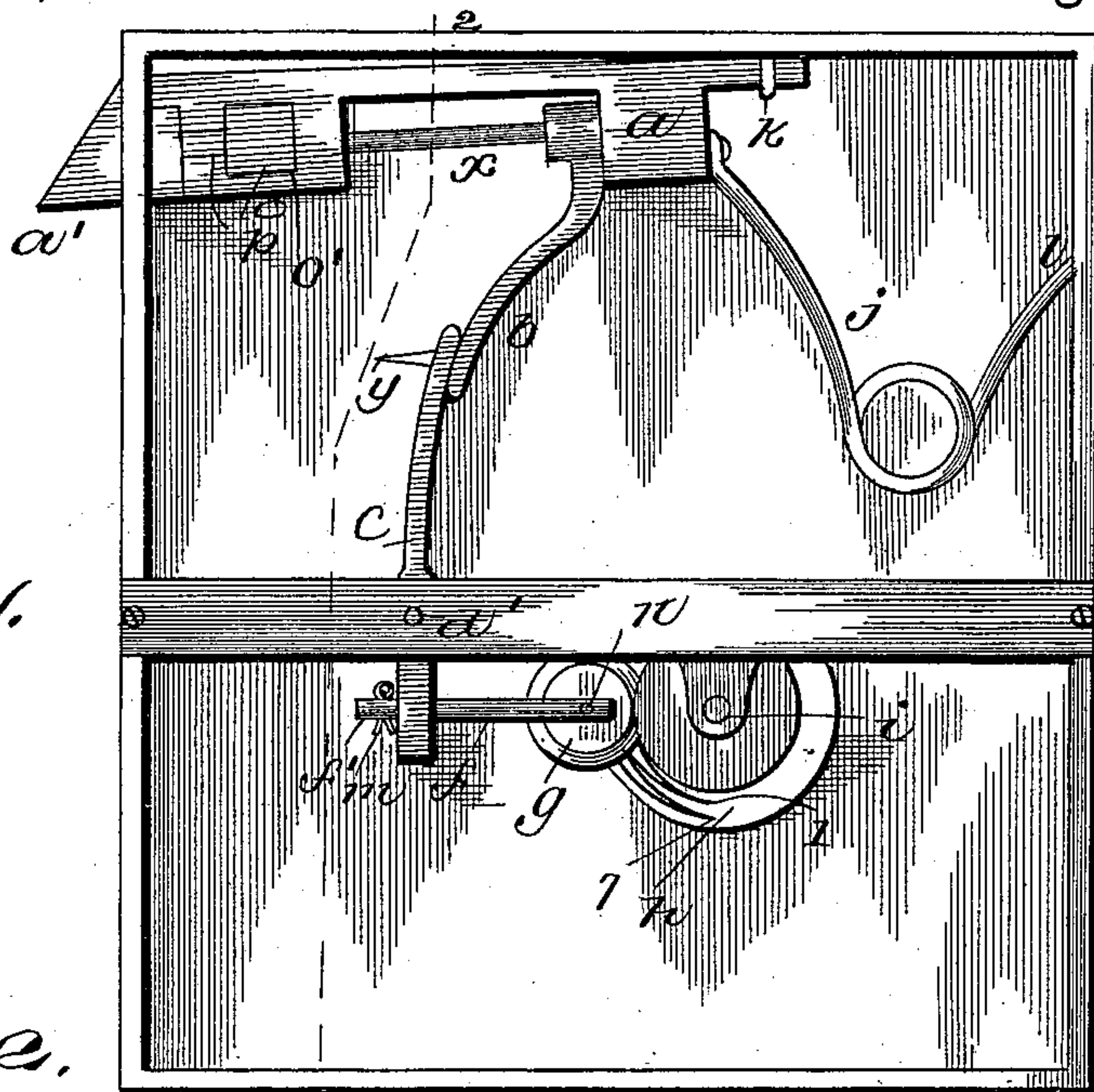


Fig. 2.

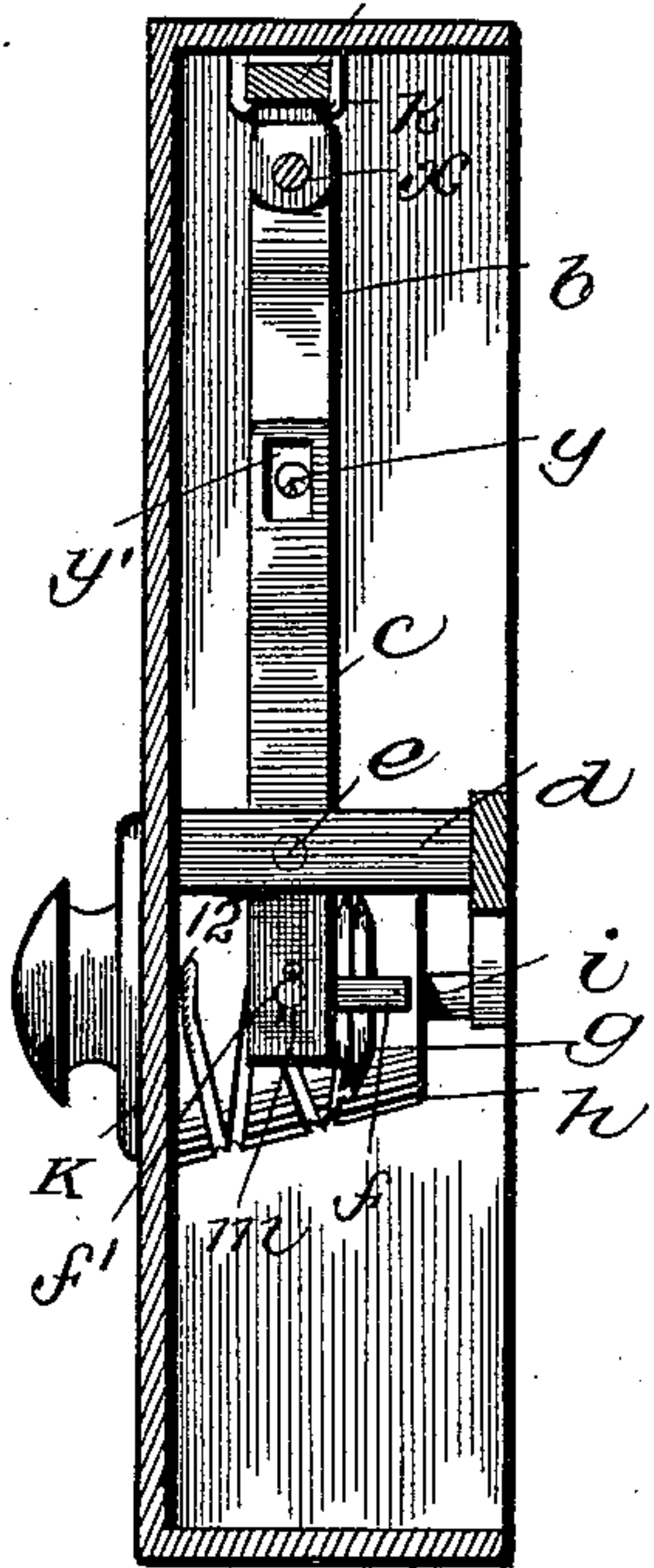


Fig. 3.

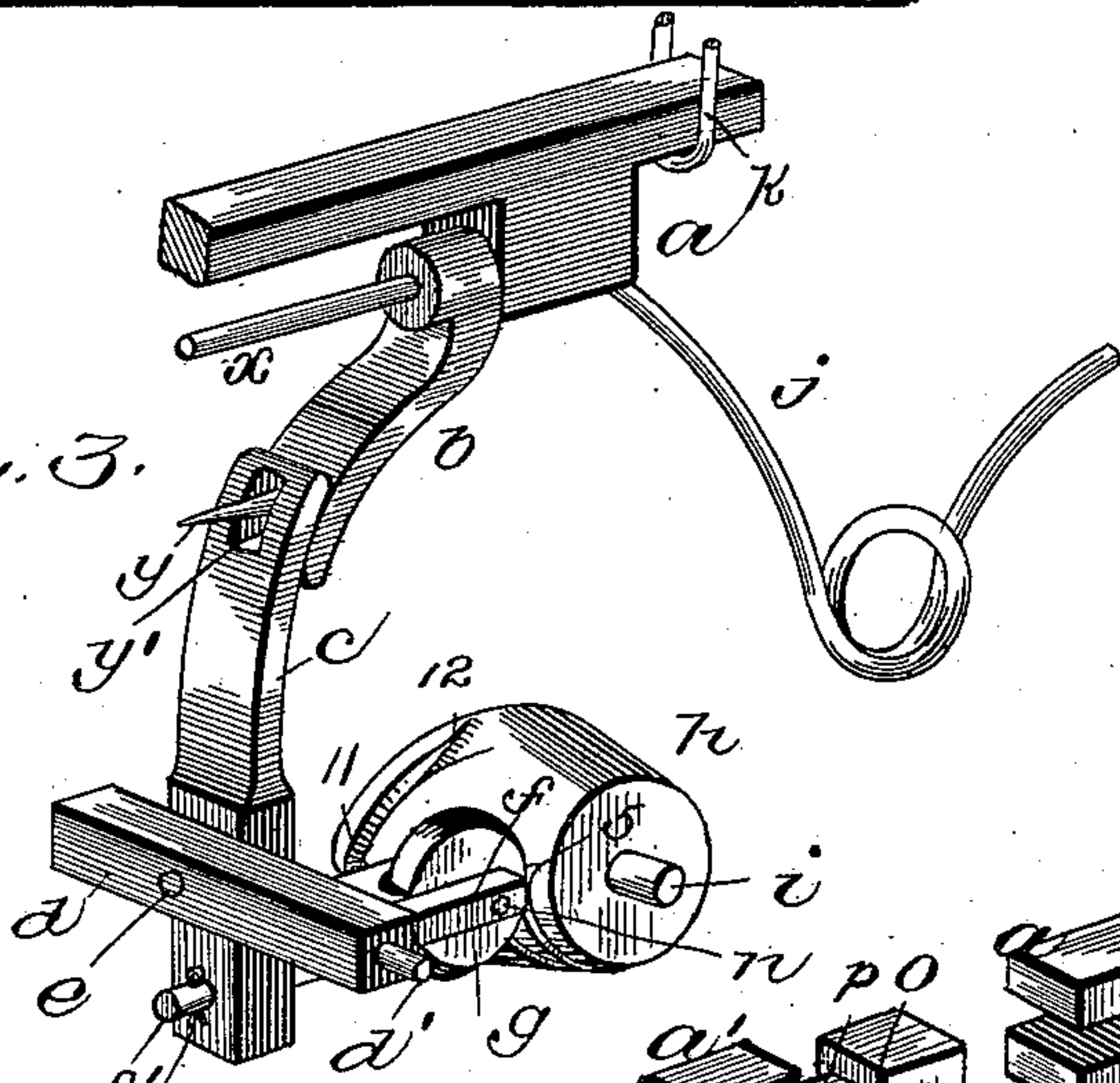


Fig. 4.

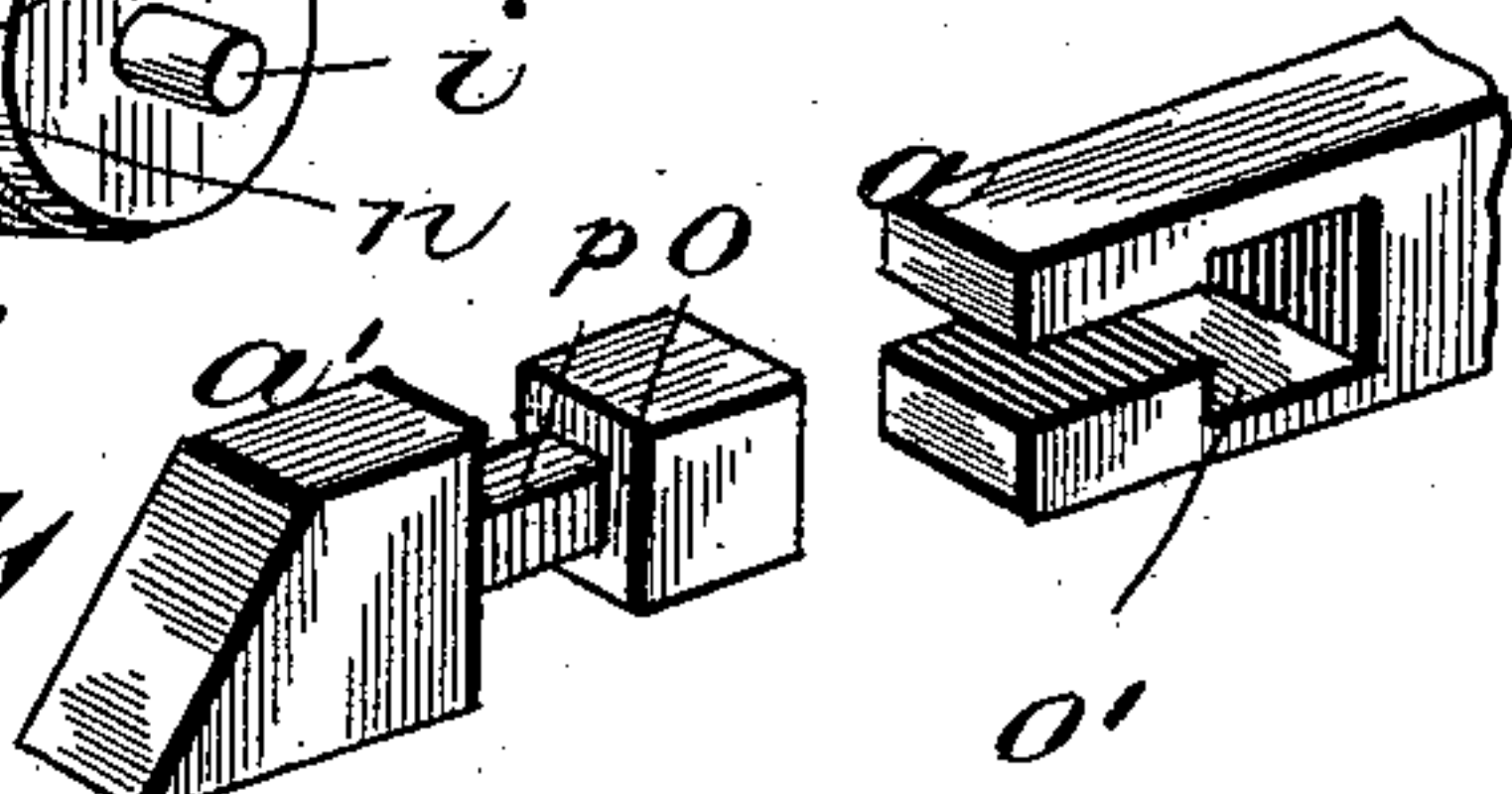
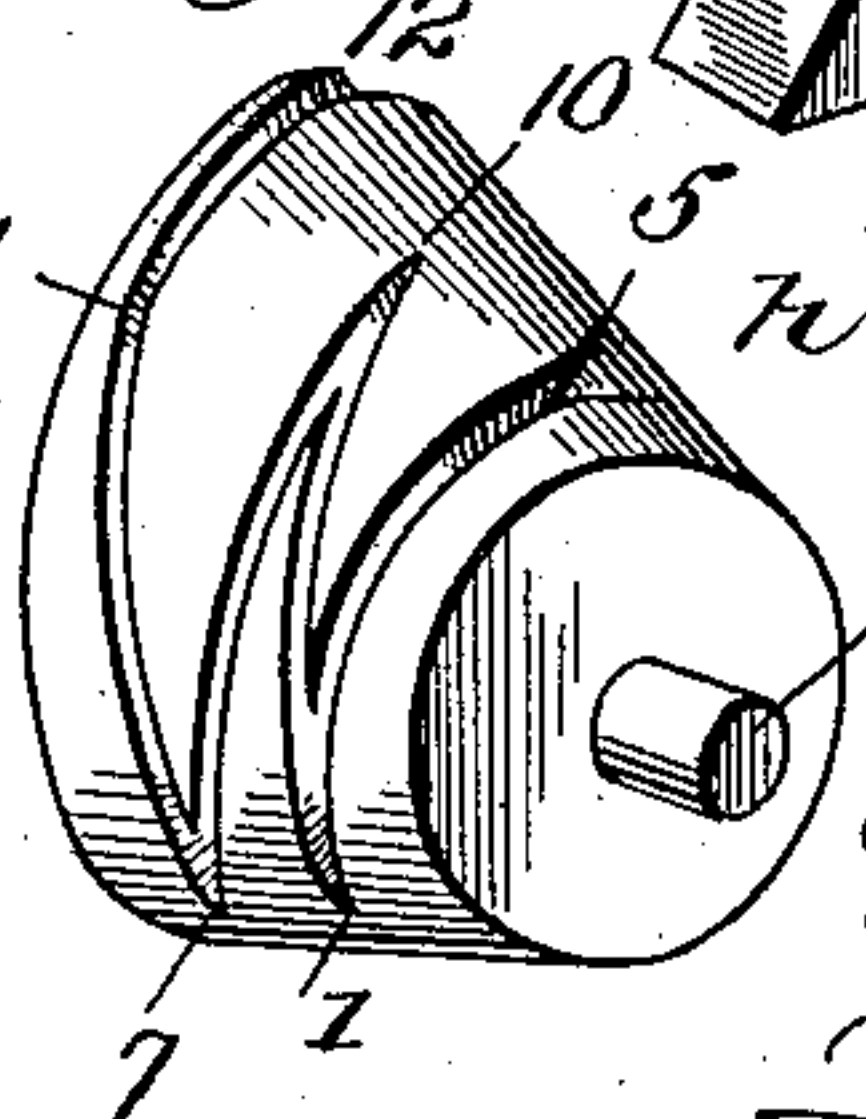


Fig. 5.



Witnesses:

John Comrie  
W. L. Collamer

Inventor:

Joseph P. Weber,

by Louis Keeser,

Attorney.



# UNITED STATES PATENT OFFICE.

JOSEPH PETTER WEBER, OF SOUTH SUPERIOR, WISCONSIN.

## PERMUTATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 565,527, dated August 11, 1896.

Application filed December 3, 1895. Serial No. 570,901. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH PETTER WEBER, a citizen of the United States, residing in South Superior, Douglas county, Wisconsin, have  
5 invented certain new and useful Improvements in Permutation-Locks, of which the following is a specification.

This invention relates to locks and latches, and embodies a construction including a latch,  
10 a lock, and permutation devices for retracting the same; and the object of the invention is to produce improvements in devices of this character.

To this end the invention consists, broadly,  
15 in a rotary drum having its face provided with a groove which, following a predetermined zigzag course, grows gradually shallower, combined with a sharp-edged wheel connected with the bolt and traveling on the  
20 face of the drum, whereby when the drum is properly manipulated the wheel is bodily moved so as to retract the bolt.

The invention further consists in one arrangement of details whereby this general  
25 idea is carried out, all as hereinafter more fully described, and as illustrated in the drawings, wherein—

Figure 1 is an elevation of this lock with the inside face-plate removed. Fig. 2 is a  
30 vertical section on the line 2 2 of Fig. 1. Fig. 3 is a perspective detail of the working parts of the lock. Fig. 4 is a perspective detail illustrating the devices for permitting the setting of the latch-point. Fig. 5 is an enlarged  
35 detail of the drum.

The letter K designates the device for turning the drum, which may consist of any suitable form of key or other device, but is shown in the present instance as a knob, such as is  
40 used in permutation or combination locks, and standing on the outer face thereof. This knob may be screwed or fastened in any suitable manner to a shaft *i*, journaled through the lock-casing and carrying the drum *h*.  
45 (Best seen in Figs. 3 and 5.) This drum may be cylindrical, although it is illustrated as slightly conical, and its face is provided with a great number of grooves both circumferential and oblique. For the sake of clearness  
50 I have illustrated only the one zigzag groove, which is utilized in retracting the bolt, which groove leads from its deepest point 5 to 1,

thence to 10, thence to 7, and thence to 11, which is its shallowest point—growing gradually shallower throughout the entire out- 55 lined course, and from 11 to 12 it grows again suddenly deeper.

*g* is a wheel having a sharp edge, as seen in Fig. 2, capable of traveling in this groove, and this wheel is connected with or carried 60 by the bolt *a* in any suitable manner, (one arrangement being hereinafter described,) whereby when the drum is turned by the knob the edge of the wheel *g* is caused to fall into the groove 5, and then by proper manipu- 65 lation is caused to pass along said groove through the outlined course to the point 11. During all this time said wheel is moved gradually farther from the shaft *i*, so that the bolt *a* is retracted, and when the point 70 11 is reached said bolt is withdrawn, so that the lock is completely unlocked. A slight further turn of the drum brings the point 12 under the wheel, whereby the bolt is permitted quickly to be shot by the spring *j* usually 75 employed.

While, as above stated, any suitable arrangement of devices may be employed for properly connecting the wheel *g* with the bolt *a*, I have shown my preferred arrangement, 80 which is as follows: The bolt *a* moves in the guides *k*, and its tip *a'* is projected normally beyond the edge of the lock by a spring *j*, connected with the bolt-casing, as at *l*. *b* is a finger carried by the bolt and having a pin 85 *y*, which projects through a slot *y'* in a lever *c*. This lever has any suitable form of pivot, although I have shown it as bolted at *e* to a cross-bar or fulcrum *d*, having trunnions *d'* at its extremities which are journaled in the 90 bolt-casing.

*f* is a fork connected in any suitable and proper manner with the lower end of the lever *c*, whereby it may move slightly therein, and in the present instance I have shown this 95 fork as provided with a cylindrical extension *f'*, passing through the lower end of the lever and receiving a split pin *m*. In the fork on a pin *n* is journaled the wheel *g*, which is arranged to stand opposite the front side of the 100 drum *h*.

With this arrangement of parts, when the knob is manipulated to properly turn the drum, the edge of the wheel traveling in the



groove in such drum causes the wheel with its fork to be pressed gradually toward the left, the extension  $f'$  of the fork turning slightly where it passes through the lever so as to permit the slight lateral movement of the wheel. This movement of the fork to the left rocks the lever on its fulcrum and its upper end presses the finger  $b$  to the right, which movement retracts the bolt against the tension of its spring. As soon as the drum is turned beyond the point 11 and the wheel permitted to pass again into the deep portion of the groove, the parts reassume the position shown in Fig. 1, and the lock is locked.

For the purpose of converting the lock into a latch I provide the body of the bolt with a longitudinal guide-rod  $x$  on which the finger  $b$  is loosely mounted in such a way that the bolt may move to the rear without moving the finger, but the finger cannot move to the rear without retracting the bolt. However, this arrangement may be dispensed with, if preferred. In order that the tip of the bolt may serve as a latch, I provide it with a beveled head  $a'$ , and this head-piece has a reduced squared shank  $p$  with a slightly-enlarged square head  $o$  at its inner end. The outer end of the body of the bolt  $a$  is provided with the recess  $o'$  in two sizes, corresponding in shape with this shank and head and open at one or both sides, as best seen in Fig. 4, and hence when desired the tip of the bolt can be detached laterally from its body and turned to any quartering position which the exigencies of the case may necessitate. These details, along with others which will occur to the skilful manufacturer, form, however, no essential part of the principal feature of my invention. I simply use them to improve the entire construction of the lock, and do not limit myself to the exact details, as various changes may be made without departing from the spirit of my invention.

What is claimed as new is—

1. In a lock, the combination with the bolt normally pressed in one direction, and a wheel connected with the bolt; of a rotary shaft, and a drum mounted thereon and having in its face an irregular groove growing gradually shallower from one point to another and then suddenly deeper again, as and for the purpose set forth.

2. In a lock, the combination with the bolt, a spring bearing it in one direction, and a sharp-edged wheel connected with said bolt; of a rotary shaft, and a conical drum mounted

thereon and provided in its face with an irregular groove growing gradually shallower from one point to another and then suddenly deeper again, as and for the purpose set forth.

3. In a lock, the combination with the bolt normally pressed in one direction, a rocking lever having one end connected with the bolt at the side opposite the direction of such pressure, and a fork carried by the other end of the lever; of a wheel journaled in said fork, and a rotary drum having an irregular groove of variable depth in its face, said spring pressing the wheel normally against the drum, as and for the purpose set forth.

4. In a lock, the combination with the bolt normally pressed in one direction, a rocking lever having one end connected with the bolt at the side opposite the direction of such pressure, and a fork having a reduced and rounded extension at one extremity journaled in the opposite end of said lever; of a wheel journaled in said fork, and a rotary drum having an irregular groove of variable depth in its face, said spring pressing the wheel normally against the drum, as and for the purpose set forth.

5. In a lock, the combination with the bolt having a longitudinal guide-rod, a spring pressing the bolt normally in one direction, a finger mounted loosely on said rod and bearing against the bolt at the side opposite such pressure, and a pin projecting from the finger; of a rocking lever having a slot loosely receiving said pin, the upper end of the lever bearing against the finger, and means substantially as described for moving the other end of said lever, as and for the purpose set forth.

6. In a lock, the combination with the bolt pressed normally in one direction, a fork, a wheel journaled in one end thereof, and connections substantially as described between its other end and the bolt for permitting a slight lateral movement of the fork; of a rotary shaft, means for turning it, and a drum mounted on the shaft and having an irregular groove of variable depth in its face with which groove the edge of said wheel engages, as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOSEPH PETTER WEBER.

Witnesses:

LOUIS FEESER, Jr.,  
G. SIEGENTHALER.