

C. C. BLISS.
Permutation-Locks.

No. 146,424.

Patented Jan. 13, 1874.

Fig. 2.

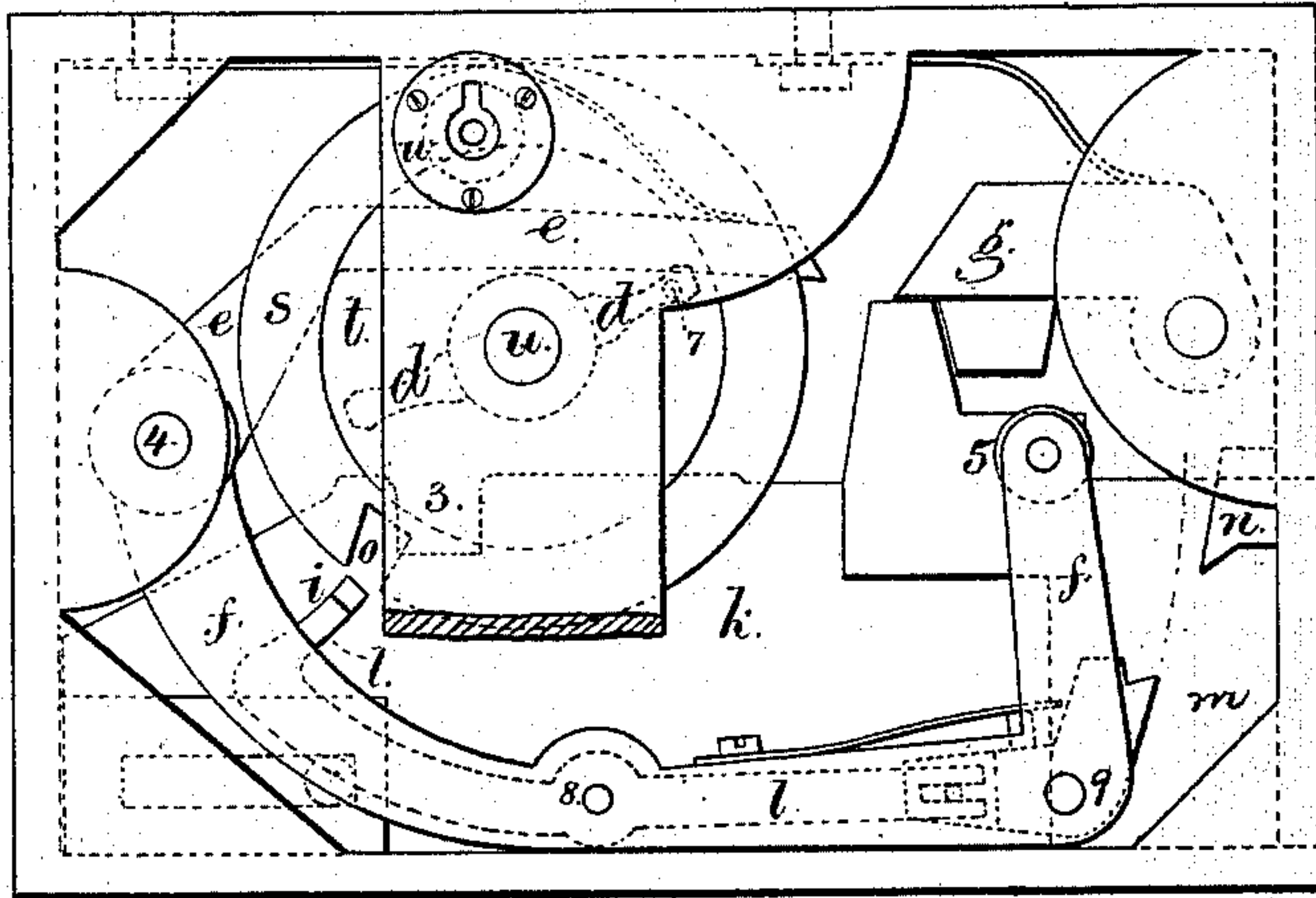


Fig. 5.

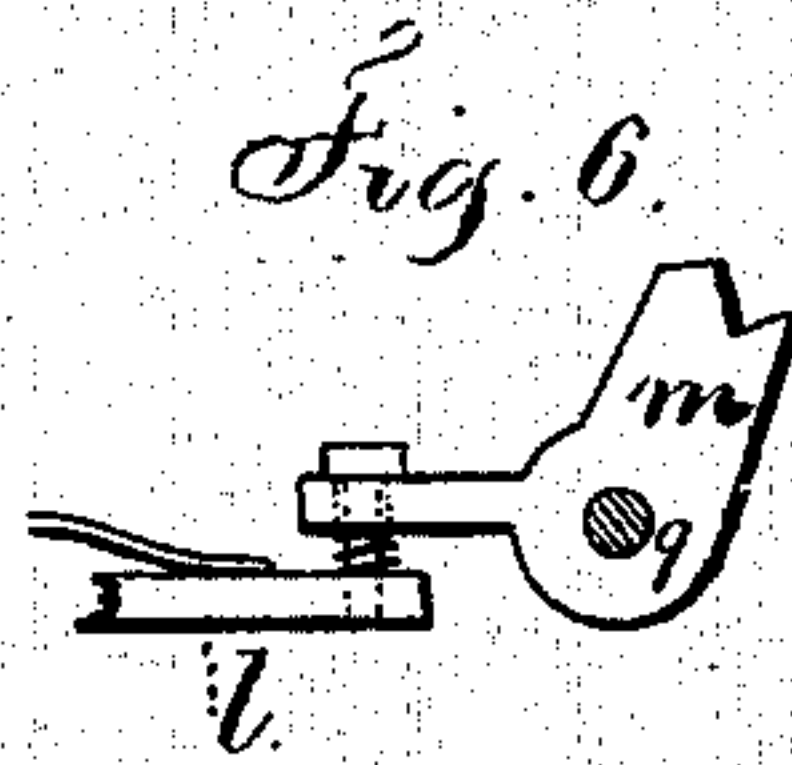
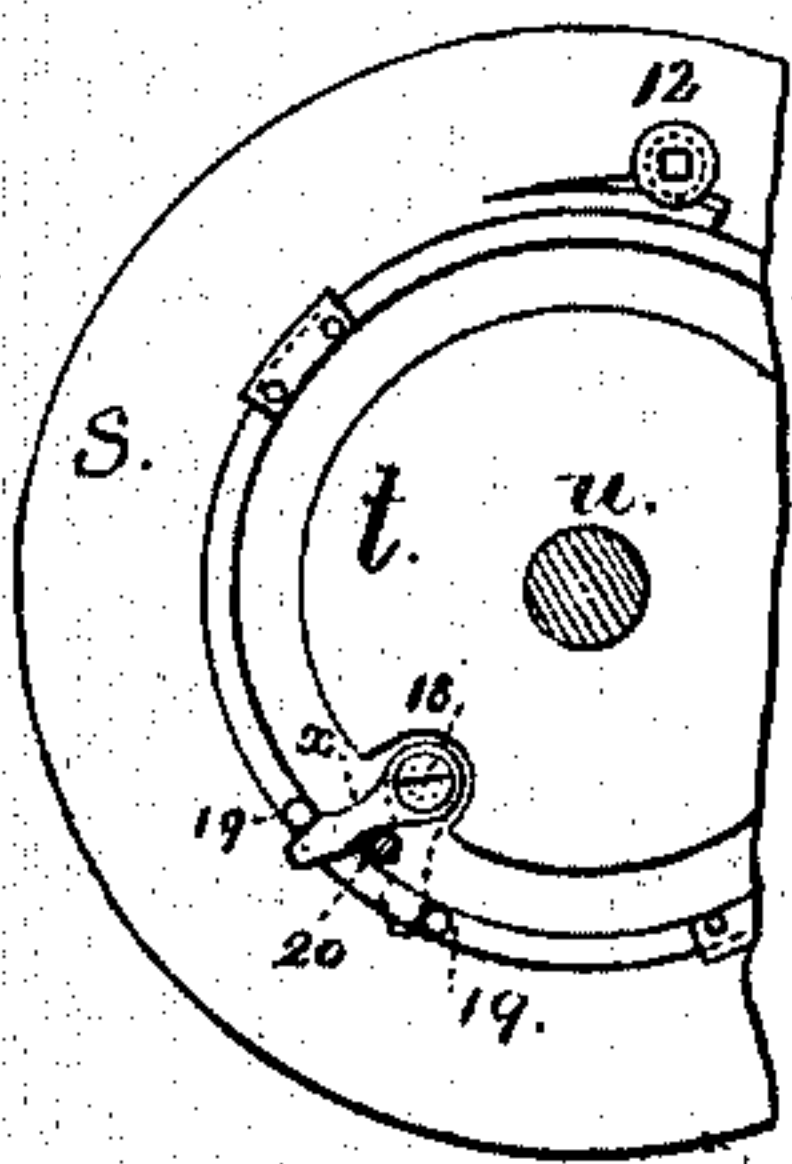


Fig. 3.

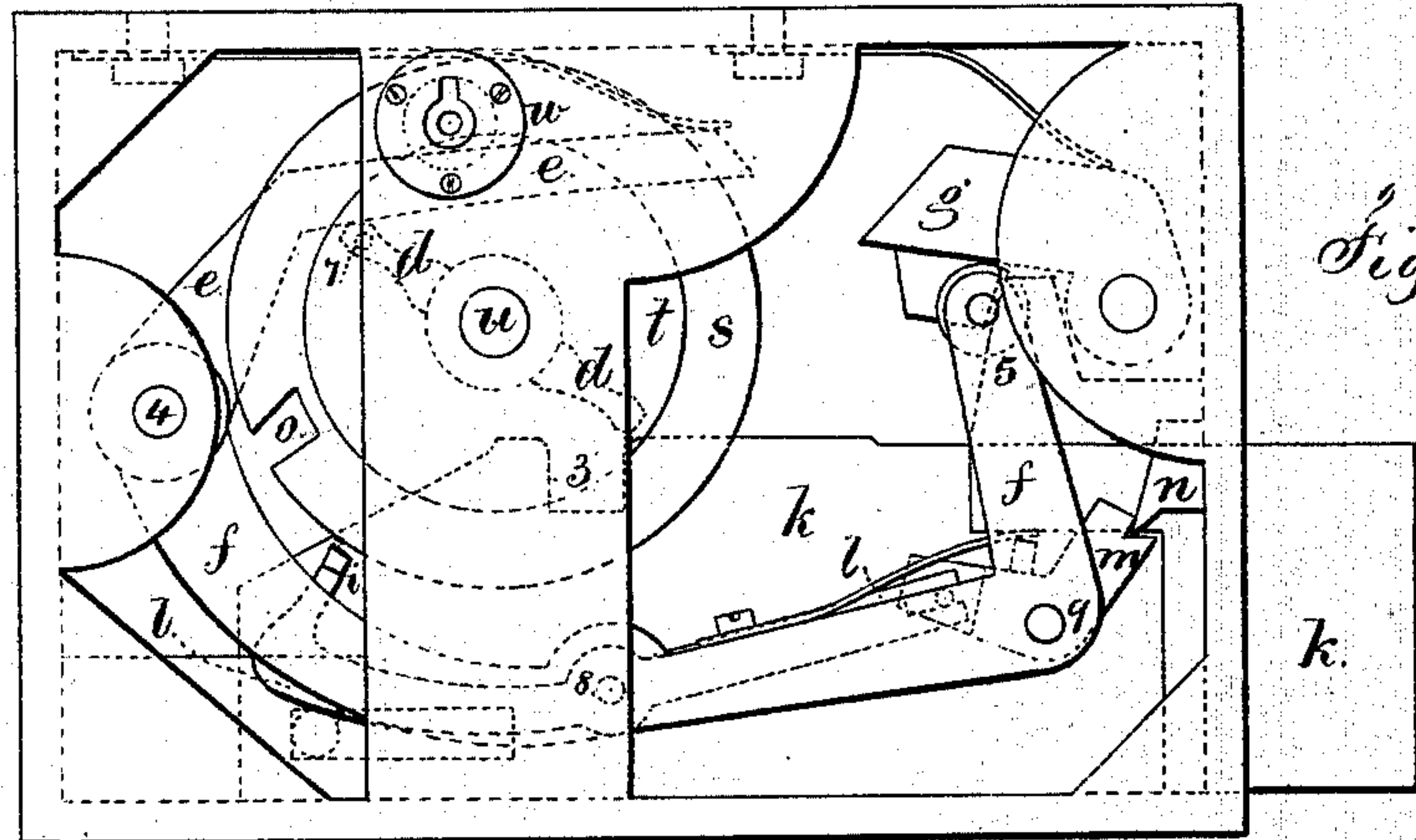


Fig. 4.

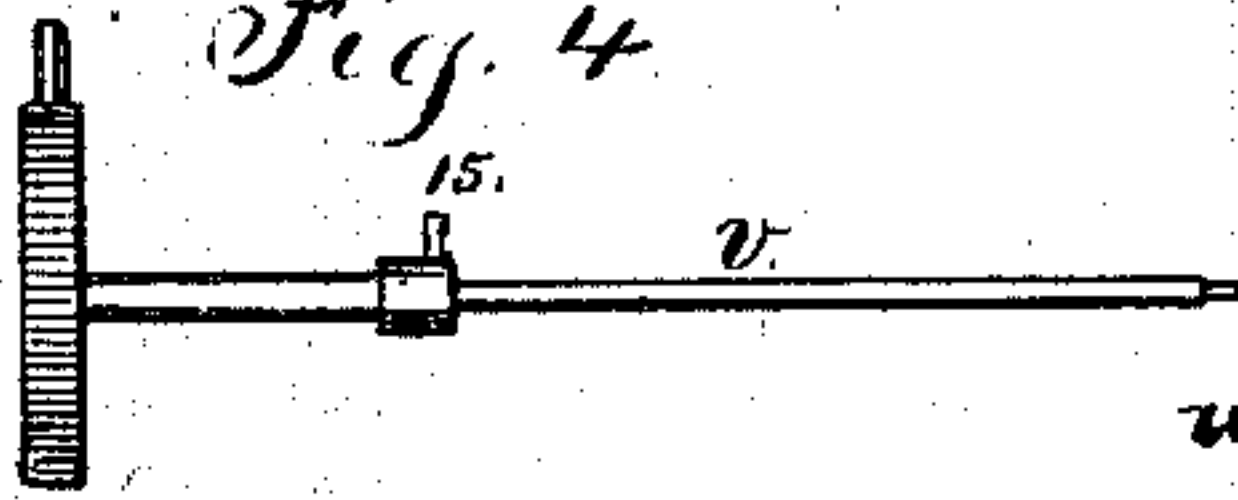
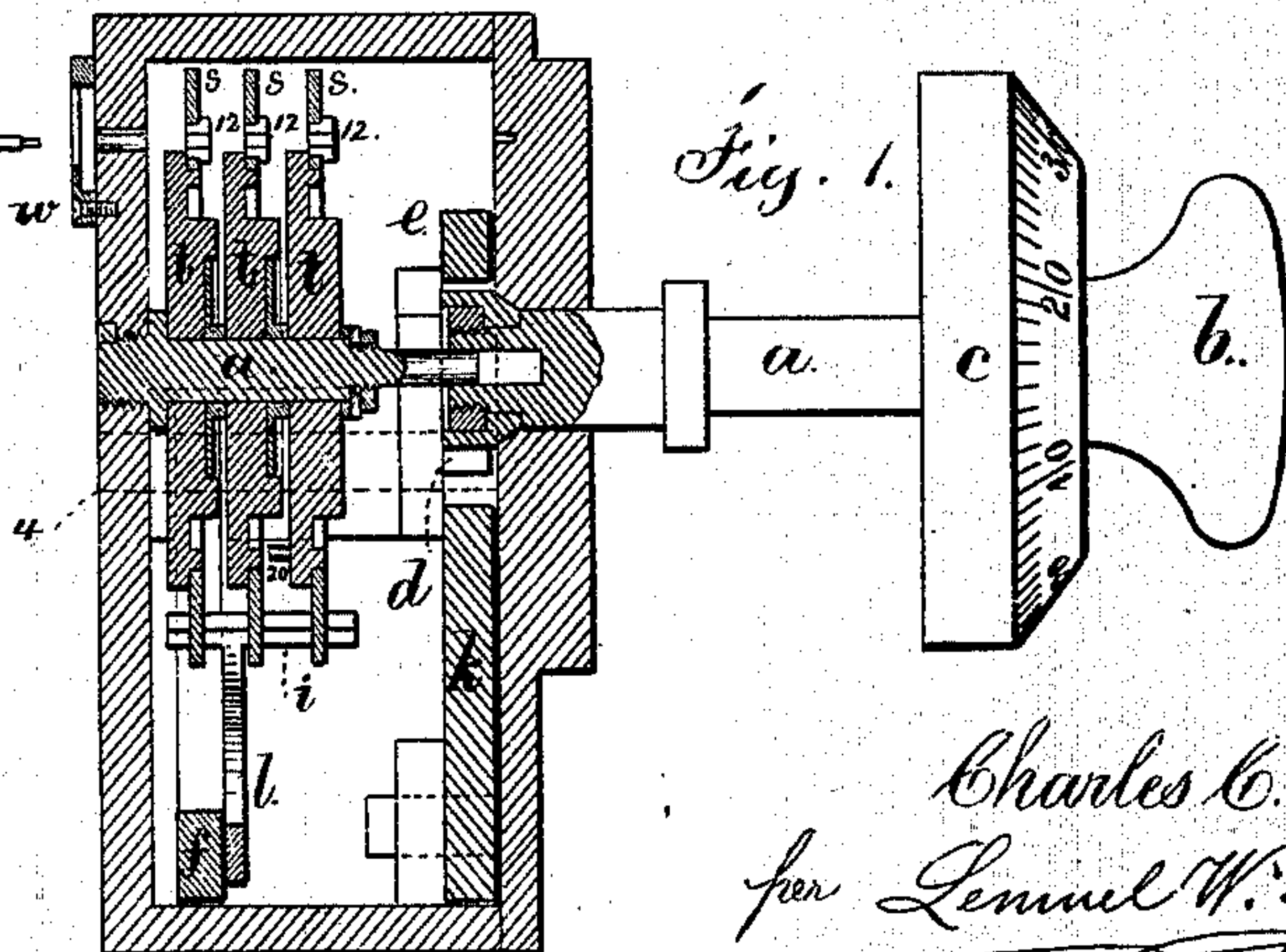


Fig. 1.



Witnesses
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UNITED STATES PATENT OFFICE.

CHARLES C. BLISS, OF NORWICH, CONNECTICUT.

IMPROVEMENT IN PERMUTATION-LOCKS.

Specification forming part of Letters Patent No. 146,424, dated January 13, 1874; application filed December 4, 1873.

To all whom it may concern:

Be it known that I, CHARLES C. BLISS, of Norwich, in the State of Connecticut, have invented an Improvement in Permutation-Locks, of which the following is a specification:

This invention relates to that class of locks in which a range of circular tumblers is employed, and the tumblers are turned by a central spindle.

I make use of a lever between the cam on the spindle and the dog for the bolt, and combine therewith a safety-stop and lever, that are brought into action by the fence when the tumblers are not properly set to allow the fence to pass into the notches; thereby the safety-stop is positioned so as to arrest the movement of the lever and prevent the bolt-dog being lifted.

In the drawing, Figure 1 is a section longitudinally of the spindle. Fig. 2 is an elevation of the lock with the back plate removed and the bolt retracted. Fig. 3 is a similar view with the bolt projected and the parts in the position they assume when an improper effort is made to retract the bolt. Fig. 4 represents the key for the tumbler-rings, and Fig. 5 shows the swinging contact-block upon the tumblers.

The spindle *a* is provided with a knob, *b*, and dial *c*, of usual construction. *d* is the two-part cam at the inner end of the spindle to act upon the talon 3 of the bolt to withdraw or project the same, and also to operate the arm *e* of the lever *f*, of which 4 is the fulcrum. The hinged dog *g* holds the bolt *k* in a projected or retracted position, and this dog is operated by the end 5 of the lever *f*. The spindle *a* is mounted so as to be movable endwise, as has heretofore been usual, so that when drawn forward the cam *d* will operate upon the arm *e* of lever *f* and talon 3 to move the bolt and lever, if the tumblers are in the correct position to allow the fence *i* to enter the notches *o*. The spindle *a* has to be pushed back in order that the pin 7 may act upon the tumblers to revolve them and set them successively, and when acting upon the tumblers the cam *d* is entirely out of contact with the bolt, and when the spindle is drawn forward to act upon the bolt, the connection with the tumblers is severed.

This has before been accomplished in other locks.

Upon the lever *f* is a secondary lever or bar, *l*, and fence *i*. The lever *f* also carries the safety-stop *m* upon the fulcrum 9. These parts are shown as connected by a fork and pin, as in Figs. 2 and 3, or else by a screw in a fork or large hole and a spring, as in Fig. 6. In either case a light spring is employed to retain the parts in a normal position.

It is preferable to connect the lever *l* to the lever *f* by the fulcrum 8; but this secondary lever or bar may be constructed in any convenient manner for communicating the movement next set forth to the safety-stop *m*.

If the fence *i* passes into the notches *o* freely, the safety-stop *m* swings clear of the arresting-block *n*, as illustrated by dotted lines. If the fence *i* touches one of the tumblers, then the safety-stop is swung and comes into contact with the block *n*, and prevents the bolt-dog *g* being raised, and the parts of *m* and *n* that come together being beveled, the effort made to move the lever *e f* results in turning the stop *m* and moving the fence *i* back away from the tumblers, as seen in Fig. 3, so that it is impossible to feel the notch by the contact of the fence *i* therewith, even if the bolt or the levers *f e l* are clamped in any manner while the tumblers are being turned.

The tumblers are made of rings *s*, surrounding grooved disks *t* upon the stationary stud *u*, and the notches *o* are in the rings *s*. The rings *s* and disk *t* are kept in the proper relative positions by small cams 12, that are perforated for the reception of a square shaft, *v*, that can be passed through all these cams and turned to release the hold of the rings *s* upon the disks *t* at the time the notches *o* are in line with the fence *i*. The spindle and disks *t* can be turned so as to set the latter at any desired figures or letters upon the dial *c*, and then the shaft *v* is partially revolved to operate the cams and clamp the respective rings and their disks.

To render it certain that the cams are properly turned, I employ the notched escutcheon *w* at the back of the lock, through which the shaft *v* is entered, and also the pin 15 projecting from this shaft. About a quarter-turn of

the shaft is made to loosen the disks and rings, and the pin 15 prevents the shaft *v* being withdrawn until the parts are again tightened by turning the shaft and cams back to bring the pin opposite the notch in the escutcheon, where it can be withdrawn.

In locks with circular tumblers, there is usually a pin or stop upon each tumbler or its disk, and in revolving the spindle to set the tumblers in succession, beginning at the back tumbler, the thickness of these stops prevents the second tumbler being turned a complete revolution, and set upon the same number or letter as the first tumbler. I obviate this difficulty by using the swinging contact-block *x* upon one side of the tumbler, and a pin, 20, upon the other side. These swinging contact-

blocks are made to turn easily upon the screws 18, and the amount of motion is limited by the stops 19, so that when the stop stands in the position shown in Fig. 5 by either the full or dotted line, the pin 20 upon the next tumbler occupies the one position indicated.

I claim as my invention—

The secondary lever or bar *l*, fence *i*, and safety-stop *m*, in combination with the lever *f*, bolt *k*, dog *g*, and tumblers *s*, substantially as set forth.

Signed by me this 2d day of December, A. D. 1873.

CHARLES C. BLISS.

Witnesses:

GEO. T. PINCKNEY,
CHAS. H. SMITH.