

A. STONER.  
PERMUTATION LOCK.

No. 338,886.

Patented Mar. 30, 1886.

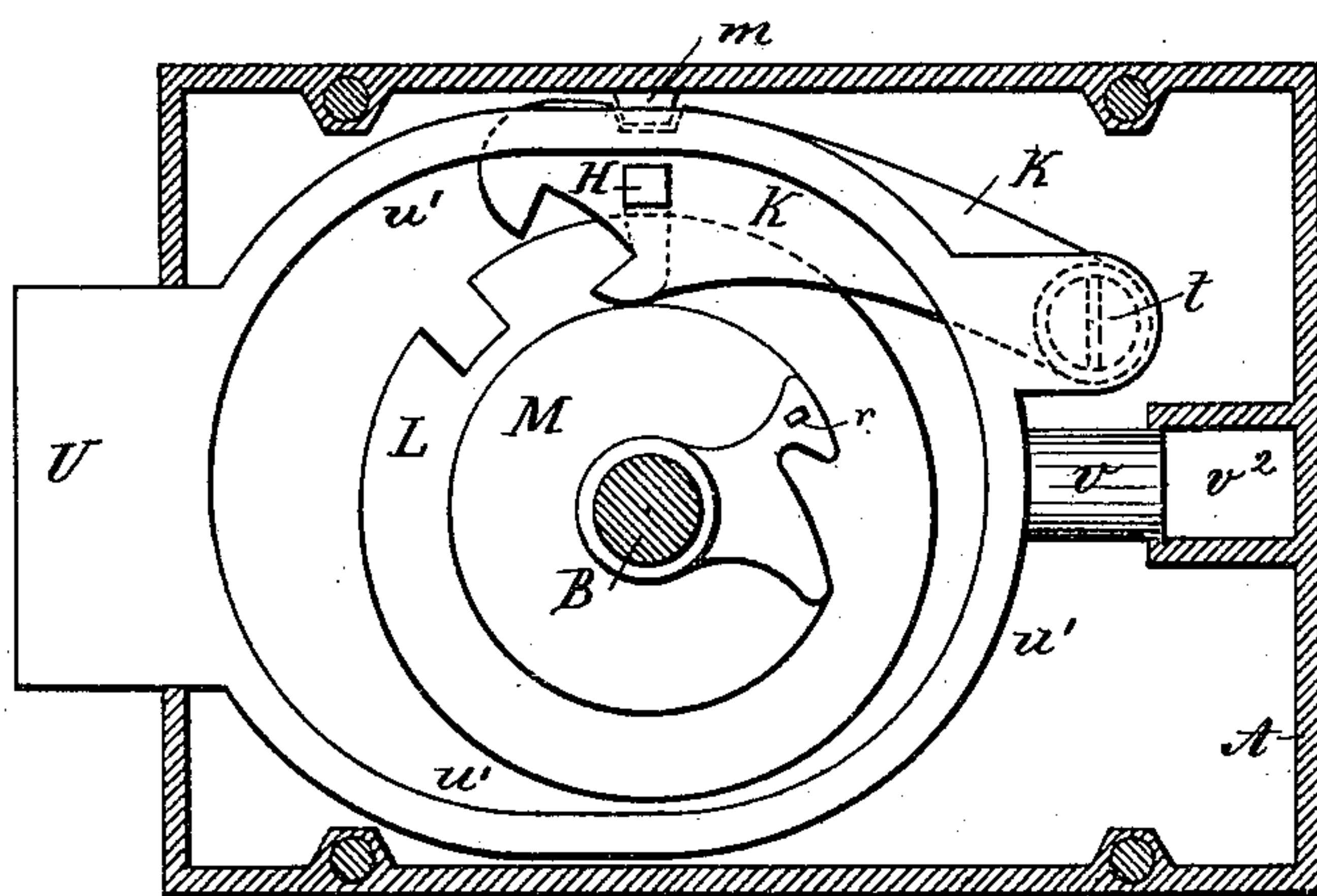


Fig. 3.

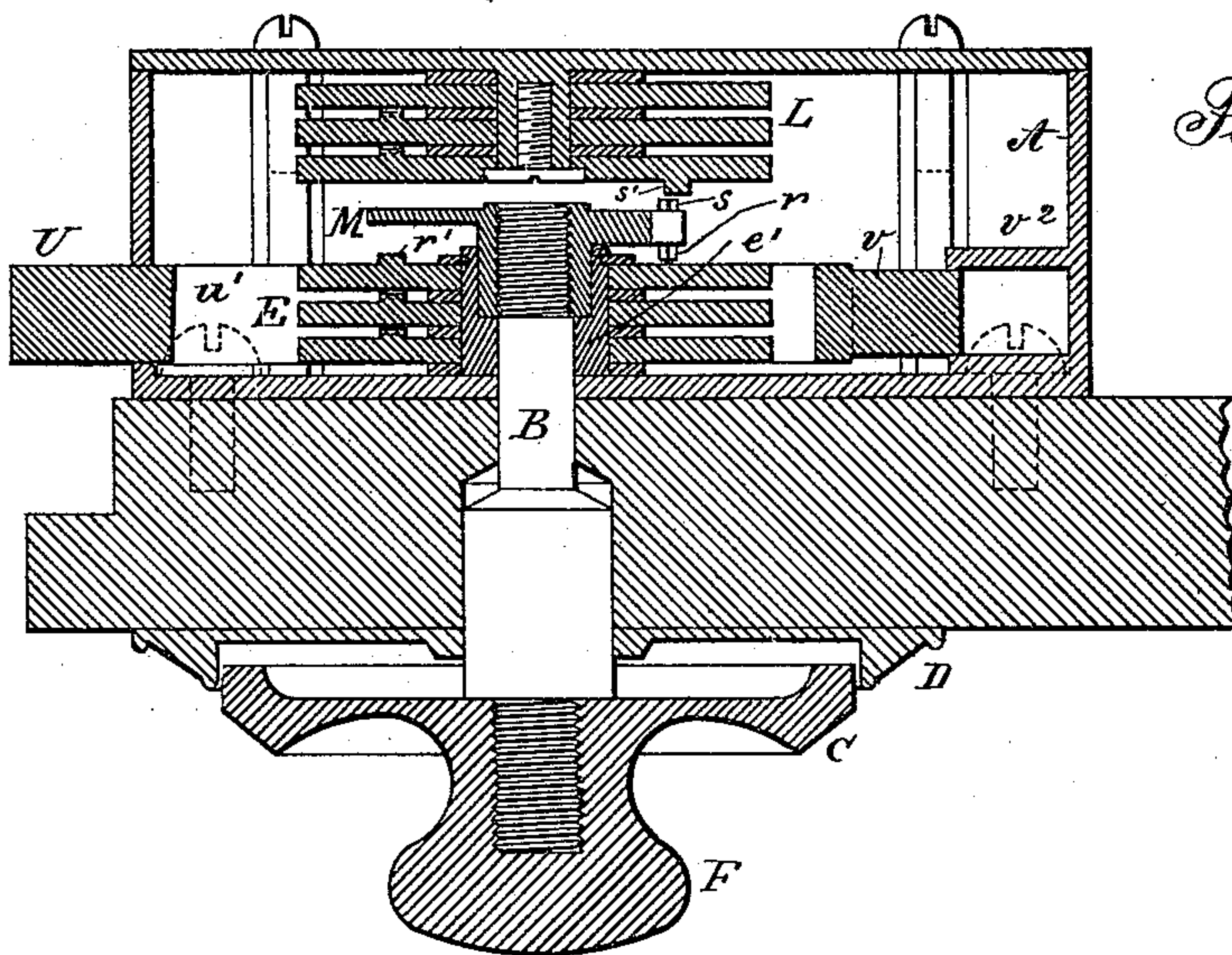


Fig. 1.

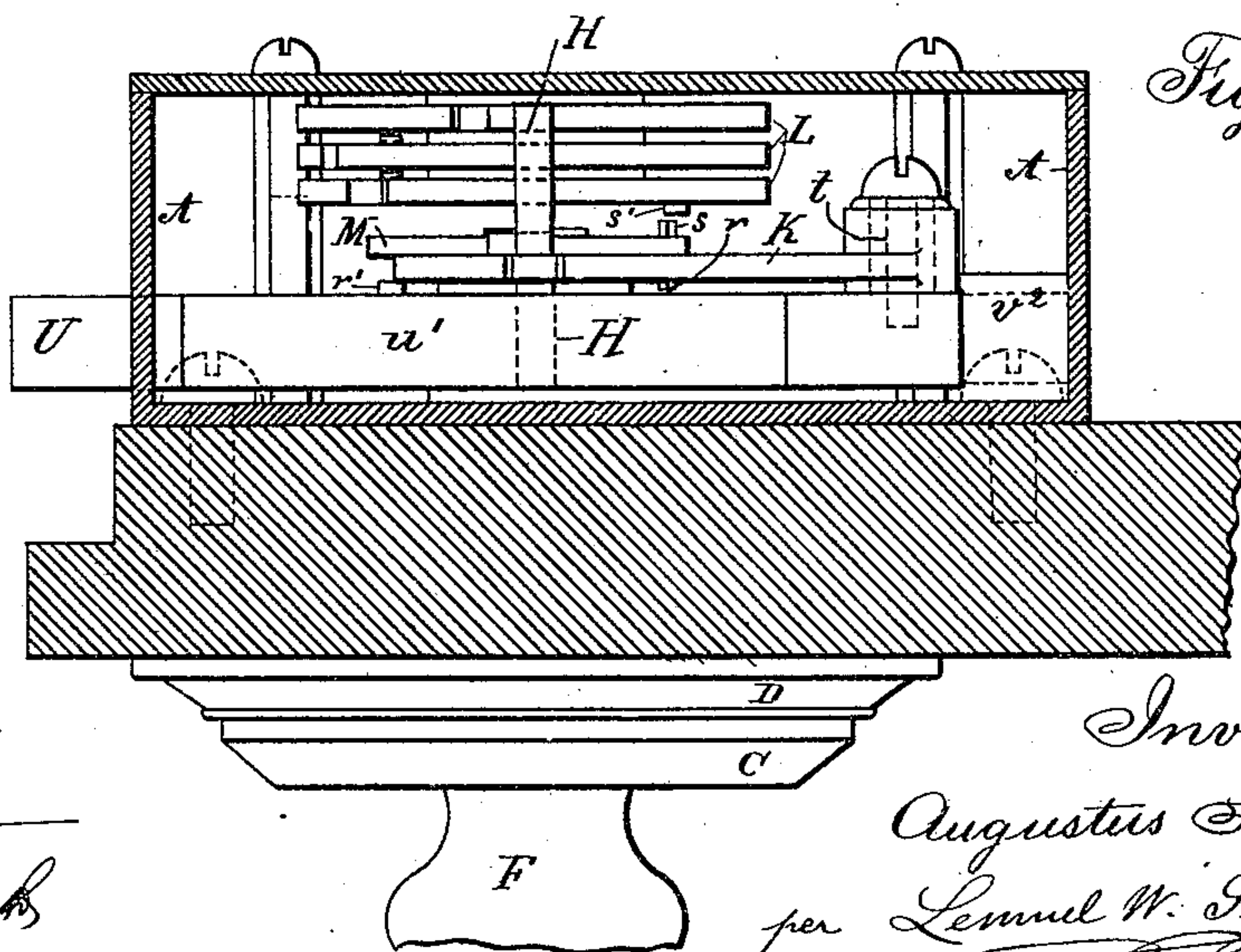


Fig. 2.

Witnesses:  
J. Staub  
Chas. H. Smith

Inventor  
Augustus Stoner  
per Lemuel W. Ferrell atty



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Fig. 5.

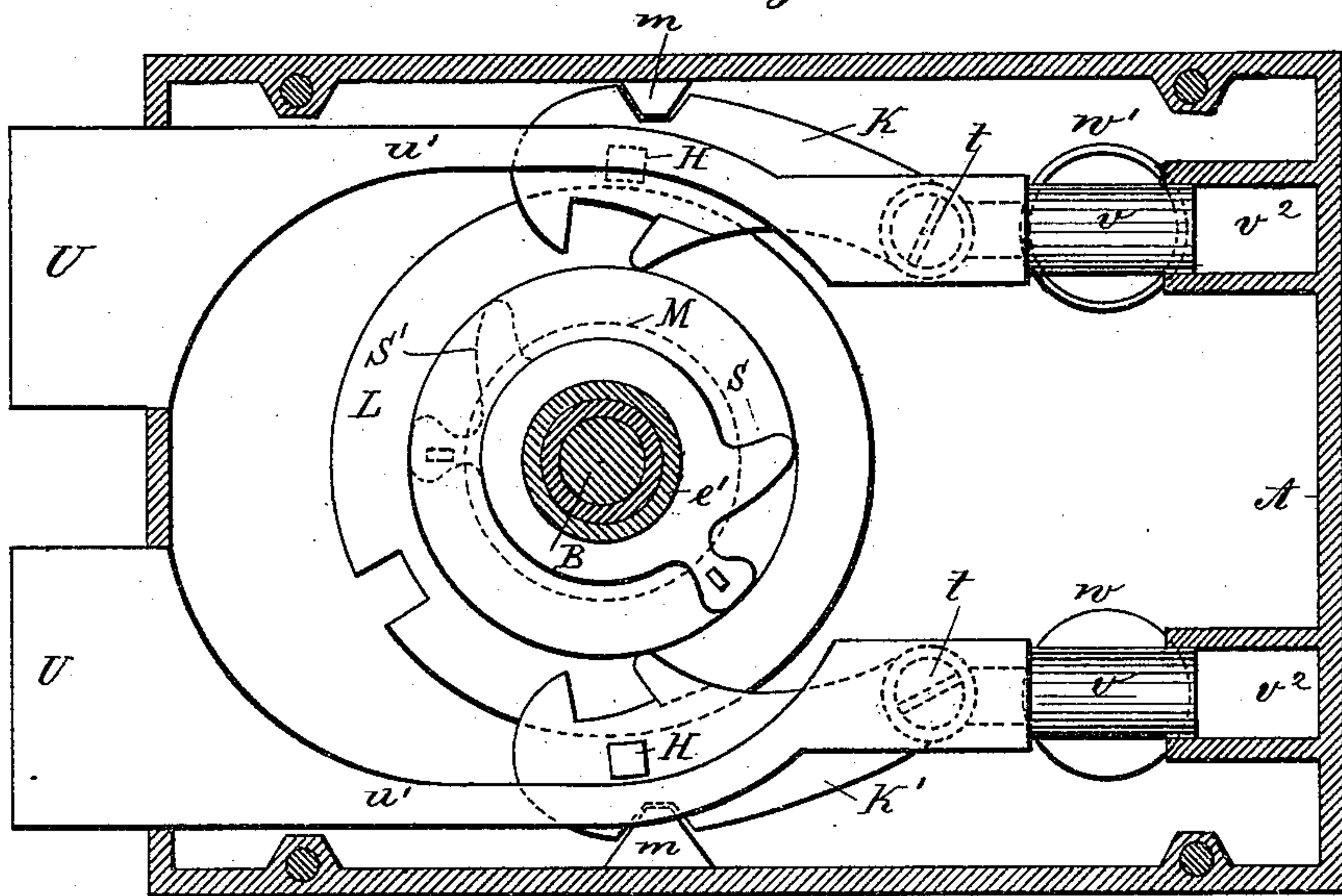
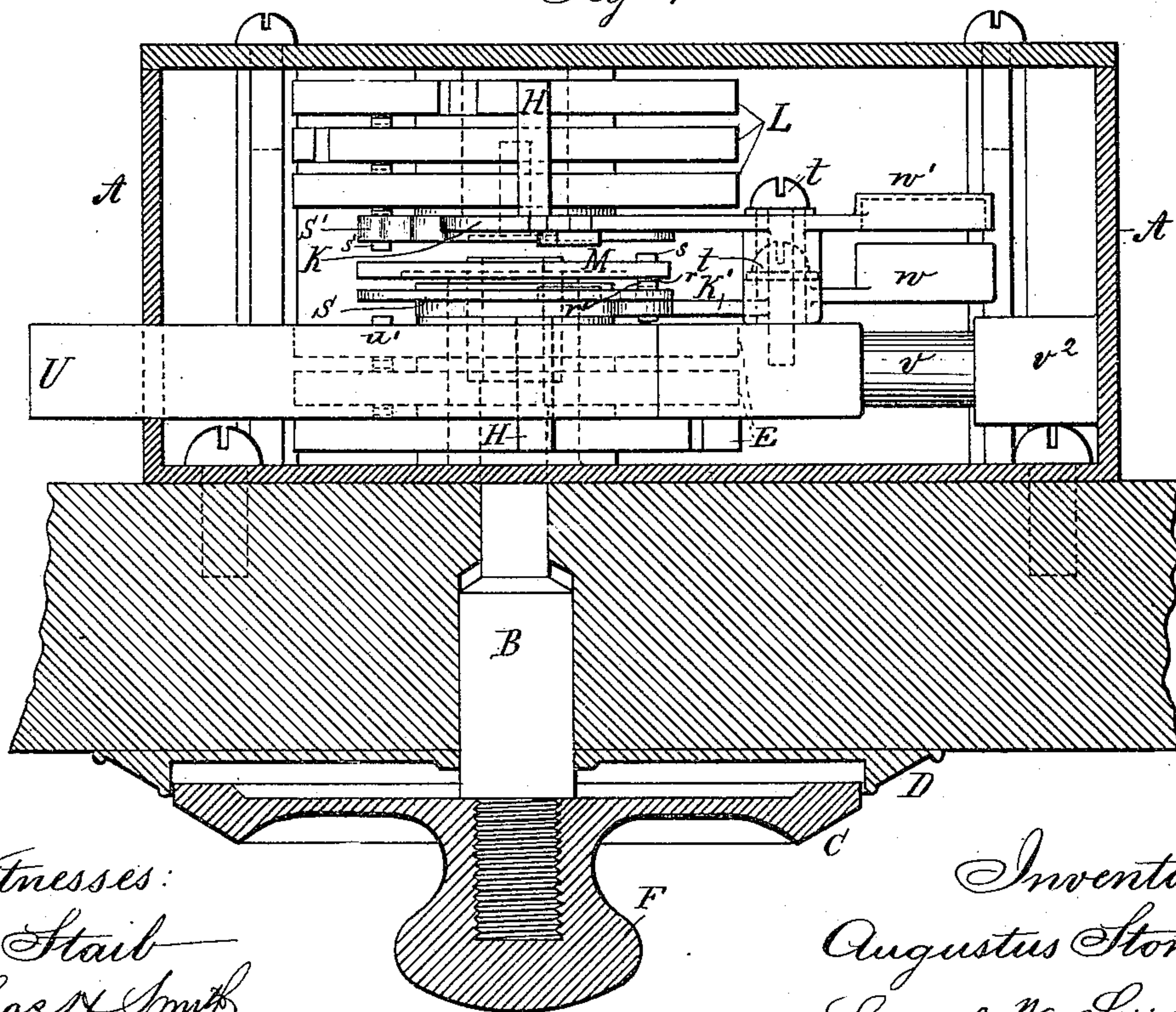


Fig. 4.



Witnesses:  
J. Staib  
Chas. H. Smith

Inventor  
Augustus Stoner  
per Lemuel W. Serrell atty.



# UNITED STATES PATENT OFFICE.

AUGUSTUS STONER, OF NEW YORK, N. Y.

## PERMUTATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 338,886, dated March 30, 1886.

Application filed July 23, 1885. Serial No. 172,373. (No model.)

*To all whom it may concern:*

Be it known that I, AUGUSTUS STONER, of the city and State of New York, have invented an Improvement in Permutation-Locks, of which the following is a specification.

Locks have been made with circular notched tumblers to be set in succession by a handle having a dial, and in some instances two such locks with separate dials have been used with one bolt or set of bolts. In some instances one set of tumblers has been used to hold the locks into the safe-door and the other set of tumblers to guard the bolt.

My present invention relates to the combination, with the ordinary spindle-knob and dial, of two independent sets of circular tumblers, the handle being capable of a slight end movement, by which it is put into connection with one set of tumblers or the other, the one dial being available for both sets of tumblers.

By this improvement all the advantages of two entirely independent locks are obtained in one lock with a very slight additional expense, so that absolute security can be obtained. For instance, in a bank or other vault or safe, if one person knows the combinations of one set of tumblers and another the combinations of the other set of tumblers, the lock can only be opened by one person setting one set of tumblers and the other person setting the other set of tumblers. This is of great advantage with safe-deposit companies, because the lessee of the safe knows his own combination-numbers and the company's representative alone knows the other combination-numbers; hence the safe must be opened in the presence or by the joint action of both parties. This is also a great security in protecting property in banks and other institutions. Besides this, my improvement is available with two sets of bolts, one set of bolts being withdrawn by the action of one person, and the other set being withdrawn by another person that sets the second set of tumblers, the one handle and dial being used for both sets of tumblers and bolts.

In the drawings, Figure 1 is a section of the lock-case and tumblers, and Fig. 2 is a plan of the bolt, dog or fence, and tumblers, and section of the case; and Fig. 3 is a view of the lock, with the case in section and one set of the

tumblers removed. These figures represent a single-bolt lock. Fig. 4 is a plan, partially in section, showing two independent fences; and Fig. 5 is a sectional view showing the improvement as applied to a double-bolt lock.

A represents the case of the lock; B, the spindle; C, the dial or index upon the spindle, and F the handle or knob, and D is the stationary ring around the dial, having a division mark or pointer. These parts are of any ordinary or usual character, and may be made in any desired manner.

E is a set of tumblers, usually three in the set. There may be more or less in the set. Each tumbler is notched, and there are pins or projections, by means of which the tumblers are turned in succession and set so that the notch comes beneath the fence H of the dog K. This set of tumblers is to be made in any of the known or desired ways, as my invention is not limited to any particular kind of circular notched tumbler, or to any particular intervening disks or connecting-studs, or to any particular construction whereby the combinations of dial-numbers can be changed, as these features are well known in locks, and the tumblers of the set E are merely shown in the drawings sufficiently to illustrate fully my invention. The dog in all cases, however, must be pivoted to the bolt so as to swing as the fence drops into the notched tumblers.

The second set of tumblers, L, is composed of circular notched disks or tumblers of any known or desired character, and the foregoing remarks concerning the set of tumblers E apply to the set of tumblers L.

The set of tumblers E are supported upon a tubular stud, *e'*, through which the spindle B passes, and at the inner end of this spindle is a cross-bar or disk, M, securely fastened, and having projections *r* on one side and *s* on the other side, either in line with each other or not, and the set of tumblers L is in the same axial line as the spindle, and the distance between the sets of tumblers E and L is such that the disk M can be revolved, and when the spindle B is drawn forward the stud or projection *r* engages with the stud or projection *r'* on the first tumbler of the set of tumblers E, so that said spindle B is to be revolved first one way and then the other until



all the disks in the set of tumblers E have been properly placed for the dog or fence H to fall into the notches of the same. During this time the set of disks L has remained quiet, because the stud or projection *s* was out of contact with the studs or projections on the first of such disks L; but by a slight endwise movement of the spindle B the projection *r* is disconnected from the tumblers E, and the stud *s* made to engage the stud or projection *s'* on the second set of disks, L, so that these are set in succession according to the proper marks or numbers on the dial, the spindle being rotated first one way and then the other, as usual. The dog K can now drop and the bolt be withdrawn, as usual, because the notches in the two sets of tumblers have now been turned so as to coincide with the whole of the fence.

The bolts and fences and dogs employed with the two sets of circular tumblers may vary according to the occasion and circumstances of use. Usually the dogs K, to which the fences H are attached, are made with hooks, that operate in connection with the notched and cam-shaped disk M upon the spindle, so that the bolt is moved either one way or the other by turning the knob F after the fence has fallen into the notches. Usually the dog is pivoted directly to the forward part or head of the bolt. I, however, prefer to make the bolt with a square end, U, sliding in a mortise in the lock-case, and to provide a bow, *w'*, that surrounds the tumblers and is sufficiently long to allow of the movement of the parts, and to this bow *w'* the dog K is pivoted at *t*. It is, however, important that the inner end of the bolt be guided as it moves back and forth, and at the same time it must be free from risk of wedging or becoming obstructed. To effect this object I make use of the guide-stud *v*, that is circular and applied at the back of the bolt-bow, the said guide-stud being received into a parallel socket, *v*<sup>2</sup>, in the lock-case.

When two bolts are made use of in place of one, as illustrated in Figs. 4 and 5, the construction and mode of operation corresponds to that before described, only there is a notched disk, S, forming a withdrawing-hook applied with the set of tumblers E, so that after setting the tumblers by the cross-bar or disk M the corresponding bolt is withdrawn, and then the spindle is moved endwise to set the next set of tumblers, L, and then the bolt of the second set of tumblers is withdrawn by the second notched disk, S'. With the two separate bolts, the half-bows *w'* connect the bolt ends with the respective guide-studs *v*.

When the parts are made as shown in Fig. 5, with one dog above the tumblers and the other below the tumblers, the upper dog, K, will drop of its own weight; but the lower dog, K', has to be raised by a weight or spring, *w*. I prefer to extend the dog to the rear in the form of a weight to lift the fence and dog

toward the tumbler, and, for the sake of appearance, there may be a hollow imitation weight, *w'*, upon the dog K.

In locks of this general character it is usual to pivot the dog to the bolt-frame between the bolts and the tumbler.

By making the bolt-frame *w'* with the guide to the rear I am enabled to pivot the dog to the rear of the tumblers without increasing the space occupied by the bolt and its connections, so that the dog holds the bolt by a tension action instead of a thrust, and the top of the dog, being notched, as shown, is held firmly when the bolt is projected by the lug *m* upon the case, so that the dog is not liable to be bent by any effort to force back the bolts.

In cases where an end movement has been given to the spindle, it has been in order that the tumblers may be set by the spindle when in one position and the bolt moved by the spindle when it is in the other position. This I do not claim; and I am aware that an end movement has been given to the spindle and that two sets of tumblers have been employed. Where these two sets are not in the same axial line, two separate dogs or fences have been used, and sometimes two bolts, and where two sets of disks or tumblers have been used in the same axial line, studs upon the bolts were used instead of hinged dogs, and hence the studs could be pressed against the disks or tumblers, which is not the case in my improvements.

I claim as my invention—

1. The combination, with a bolt and a dog pivoted upon said bolt and a fence on the dog, of two independent sets of circular notched tumblers in the same axial line, a spindle capable of a limited movement endwise, and a cross-bar or disk upon the spindle for setting first one set of tumblers and then the other, substantially as set forth.

2. The combination, with two separate sets of circular notched tumblers in the same axial line, of a spindle, a tubular stud for one set of tumblers, through which the spindle passes, a stud for the second set of tumblers in line with the tubular stud, a cross-bar or disk at the inner end of the spindle, and projections *r s*, for engaging and turning the tumblers in one set of tumblers or the other, substantially as set forth.

3. The combination, with the two separate sets of notched circular tumblers in the same axial line, of one spindle and its cross-bar and dial for setting first one set of the tumblers and then the other, and two bolts and their respective pivoted dogs and fences, and the notched disks S S', one dog being below one set of tumblers and swinging upwardly, and the other dog being above the other set of tumblers and swinging downwardly, the said dogs being moved in the opposite directions by the respective notched disks S S', substantially as set forth.

4. The combination, with the circular tum-



blers, and the means for setting the same successively, of the bolts, the bolt-frame extending behind the tumblers, the guide upon such frame, a socket upon the case for the same,  
5 the dog pivoted to the frame to the rear of the tumblers and notched, the lug *m* upon the case, and the fence or studs upon the dog, substantially as set forth.

Signed by me this 20th day of July, A. D.  
1885.

AUGUSTUS STONER.

Witnesses:

GEO. T. PINCKNEY,  
L. W. SERRELL, Jr.