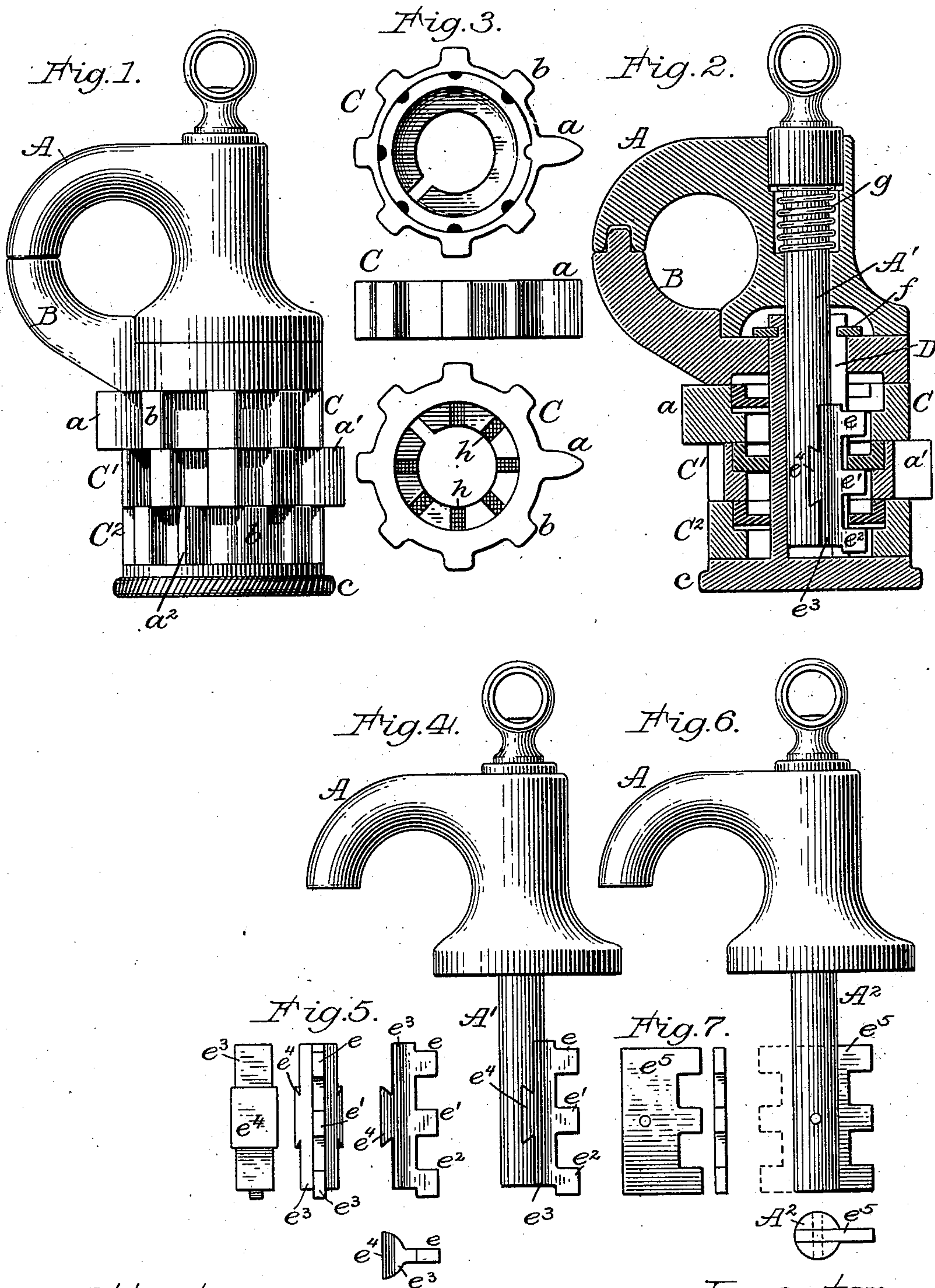


(No Model.)

H. C. LOWRIE.
PERMUTATION PADLOCK.

No. 512,980.

Patented Jan. 16, 1894.



Attest:
Philip F. Larner.
Howell Battle.

Inventor:
Harvey C. Lowrie.
By *McMurd*
Attorney.

UNITED STATES PATENT OFFICE.

HARVEY C. LOWRIE, OF DENVER, COLORADO.

PERMUTATION-PADLOCK.

SPECIFICATION forming part of Letters Patent No. 512,980, dated January 16, 1894.

Application filed April 20, 1893. Serial No. 471,145. (No model.)

To all whom it may concern:

Be it known that I, HARVEY C. LOWRIE, of Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Permutation-Locks; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a clear, true, and complete description of my invention, as embodied by me in permutation-padlocks.

My present improvements have been embodied by me in a lock containing various features of invention which have been fully disclosed in another contemporaneous application filed by me. (See Serial No. 471,015.)

In permutation padlocks as heretofore constructed, a series of notched disks overlying each other on one side of the lock, have been employed as parts of interior working rings, and the initial character on each ring, has been accompanied by a pin, projecting laterally from the face of the disk, thus enabling the lock to be worked without the aid of the eyes, and solely by the sense of touch, and the mathematical operation of counting, either way from said pins, the notches being readily felt by the operator. So far as I know, I am the first to apply this principle to padlocks in which the working rings are rotative around the shank of the hasp, and to attain the desired ends by providing the several working rings with a series of projections, for indicating its divisions, and in having the initial projection extended beyond all of the others, in the same ring, to serve as an initial feeling point.

Another object of my invention is to enable the rotative hasp shanks of permutation padlocks, with their several radial locking studs, to be very economically constructed, and with great accuracy; and to those ends, I provide the hasp shank with a recess adapted to receive the base piece, with which the several locking studs are integral. It is well known that as the locking studs become worn, the lock is rendered more and more insecure as against tampering, and I am enabled to use specially hard metal studs, in a hasp shank composed of softer metal such as cast bronze, brass or iron. The several studs being on one base piece, all of them can be simultane-

ously finished up by the use of suitable tools, and their proper dimensions and relative positions are absolutely assured, with the expenditure of a minimum of labor, and at comparatively unskilled hands. This portion of my invention, taken in connection with other features of my invention, disclosed in my aforesaid application, enables me to separately construct the hasp shank and its locking studs, and to co-operatively unite them, without the aid of rivets, pins, or other extraneous or special fastening devices. In other words, the hasp shank is mounted within a central tube, which serves as the axial foundation of the lock, and also serves to maintain the locking studs in operative union with the hasp shank.

To more particularly describe my invention, I will refer to the accompanying drawings, in which—

Figure 1, illustrates in side view, one of my locks embodying my present invention completely, and in an improved form. Fig. 2, illustrates the lock in central section, showing the slotted tube, which contains the hasp shank and its locking studs, said tube being the axial portion of the lock, with which the working rings are concentric. Fig. 3, illustrates in three views, one of the working rings complete, but detached from said lock. Fig. 4, illustrates the hasp and its shank, detached from the lock, the shank being a set of united locking studs, detachably connected with the shank. Fig. 5, illustrates the locking studs detached from the shank, in several views. Fig. 6, illustrates a modification of the hasp shank, and the locking studs, in side and end views. Fig. 7, illustrates, in two views, the locking studs of Fig. 6 detached from the shank.

The lock here shown has a hasp A, and a hasp horn B, and their organization with the working rings C, C', C², the central slotted tube D, and the hasp shank A', within said tube, involves several features of invention which were disclosed in my aforesaid application for patent. These working rings C, C', and C², are believed to be novel, in that they need have no numerals, or letters, or other similar means for optically indicating the sequential order of their several divisions; and also in that they have each a single specially devel-

oped feeling point, or pointer, as at a , a' , and a'' , this being in each instance, a lateral projection, radically unlike all the others, in that it is longer than any of the others; this feature constitutes a valuable portion of my invention, whether designating characters are employed therewith or not. It will be understood that these pointers, serve merely as readily felt "starting gages" in that the next projection b , to the right hand being also easily felt, will be readily recognized as division 1, for instance, while the next projection b , to the left hand, will be readily recognized, on ring C, for instance, as division 7, the rings varying as to their divisions; C having eight; C', nine, and C'', ten divisions. It will now be readily seen, that the several special projections serve as feeling points, and that by feeling and counting either way from the pointer, any one of the divisions, No. 4, for instance, may be located in any one position, and that in like manner the next appropriate division of the next ring (say division 5) may be readily placed in line with the first, and so on with the third ring at 6, for instance, and so on again, throughout any number of rings. With the divisions 4, 5 and 6, thus in line, (this being assumed to be the unlocking combination at which the lock has been set) it is then only necessary with this lock, to partially rotate the base c , of the slotted tube until the hasp is released. With the same system of rings, however, in some other forms of locks, the hasp would be released, or at least rendered movable for unlocking, as soon as the several proper divisions were placed in line with each other. These projected pointers constitute on each working ring, a specially developed feeling point, which affords a promptly secured starting point, from which the several divisions, (whether marked by projections, or by depressions,) may be counted, and readily located without the use of the eyes of the operator. Now for enabling the lock to be more conveniently worked by daylight for instance, each of these projections, or the intervening recesses, may be inscribed with suitable numerals, or letters, without involving any departure from my invention.

The hasp shank A', of this padlock, is longitudinally movable within the slotted tube D, and the latter is rotatable with said shank, independently of the hasp, as in the lock disclosed in my said other application; but this hasp shank A', with its locking studs e , e' , e'' , is unlike the corresponding portion of the lock so disclosed, this having several locking studs which are integral with each other, and have a base piece e^3 , which is common to all of them. At the back of said base piece, a tenon e^4 , is formed, which occupies a corresponding recess in the side of the hasp shank as clearly indicated in Figs. 4 and 5. Now although the locking studs and the shank are not united by any special securing devices, such as pins or rivets, they become co-operatively united, when placed within the slotted

tube D, because the interior surface thereof, being in annular contact with the shank and base piece e^3 , serves as a free binding clamp, and causes the two parts to maintain their relative positions as against rotative, and lateral displacement, while the tenon e^4 , in its recess, guards against longitudinal displacement. As disclosed in my said other application, the several working rings are confined in position, and the hasp shank prevented from undue retraction, by means of a detachable yoke or clip f , which occupies transverse slots in the two sides of the central tube near its top. So also in this lock, a spring g , actuates the hasp shank longitudinally, independently of the hasp, and each of the working rings has a series of false notches h , with certain desirable advantages accruing therefrom, all as fully disclosed in my said other application.

This feature of my invention, which includes the separable construction of the rotative hasp shank and locking studs, and in having the several studs integral with each other on a common base piece, is not restricted to such a combination thereof as would require the central tube to serve as a clamping element, because it is in some instances desirable to have the central tube diametrically slotted, *i. e.*, at both sides, and to use therewith either a single or a double set of locking studs on the hasp shank. As for instance, as shown in Figs. 6 and 7, wherein the hasp shank A² is longitudinally slotted, and the locking studs are integral with a base piece e^5 , the whole being cut as by dies, from a thin piece of suitable sheet metal, which on being put within the slot in the shank, is secured as by a pin or rivet to the hasp shank, as clearly indicated. With this construction, the locking studs may be in a single set, or in a double set, the latter being indicated in dotted lines in Fig. 6.

I am of course aware, that many lock keys have had separately constructed bits, inserted into slotted key shanks; I am also aware that in padlocks having non rotative hasp shanks, the several lugs have been integral with a sliding plate backed by a spring, but it will be obvious that in permutation padlocks having rotative hasp shanks, the conditions heretofore involved have been such that the hasp shanks must have had either integral locking studs in some form, or radially inserted pins, whereas in my locks, the central tube being interposed between the hasp shank, and the working rings, renders it for the first time practicable, as well as desirable, to separately construct the hasp shank and the locking studs.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a permutation lock a set of working rings concentric with the hasp shank, each provided externally with a series of projections for indicating its divisions, and having

one of said projections longer than the others, and hence readily distinguishable therefrom by feeling or touch substantially as described.

5 2. In a permutation padlock, the combination with suitable working rings, of a rotative hasp provided with a shank having a separately constructed set of locking studs integral with each other and rigidly carried by said shank, substantially as described.

10 3. In a permutation padlock, the combina-

tion with suitable working rings, of a hasp provided with a shank having a separately constructed set of locking studs, and a central tube containing said shank, and maintaining the locking studs and shank in cooperative relations, substantially as described. 15

HARVEY C. LOWRIE.

Witnesses:

PHILIP F. LARNER,

HOWELL BARTLE.