

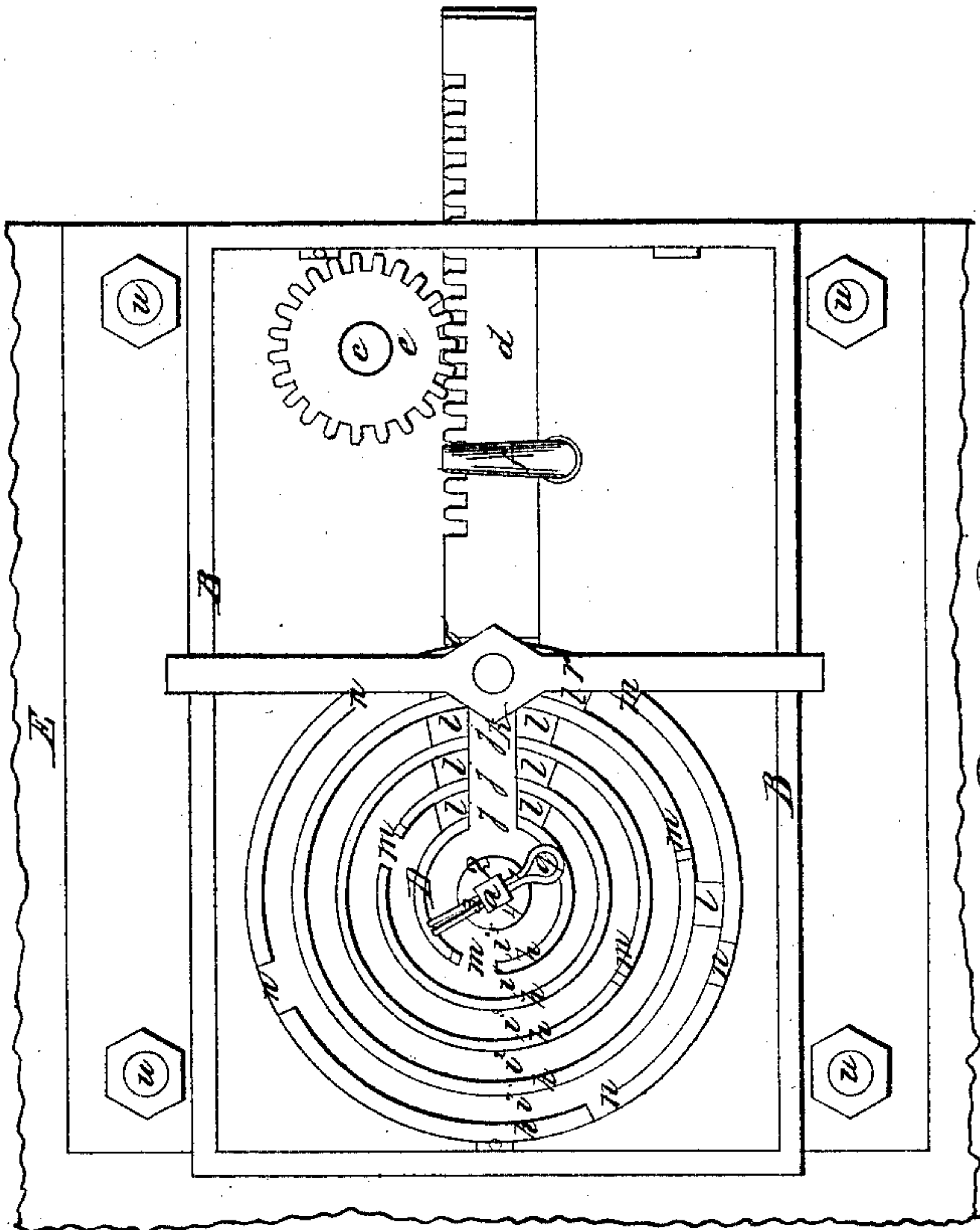
*T. Nicholson,*

*Permutation Lock.*

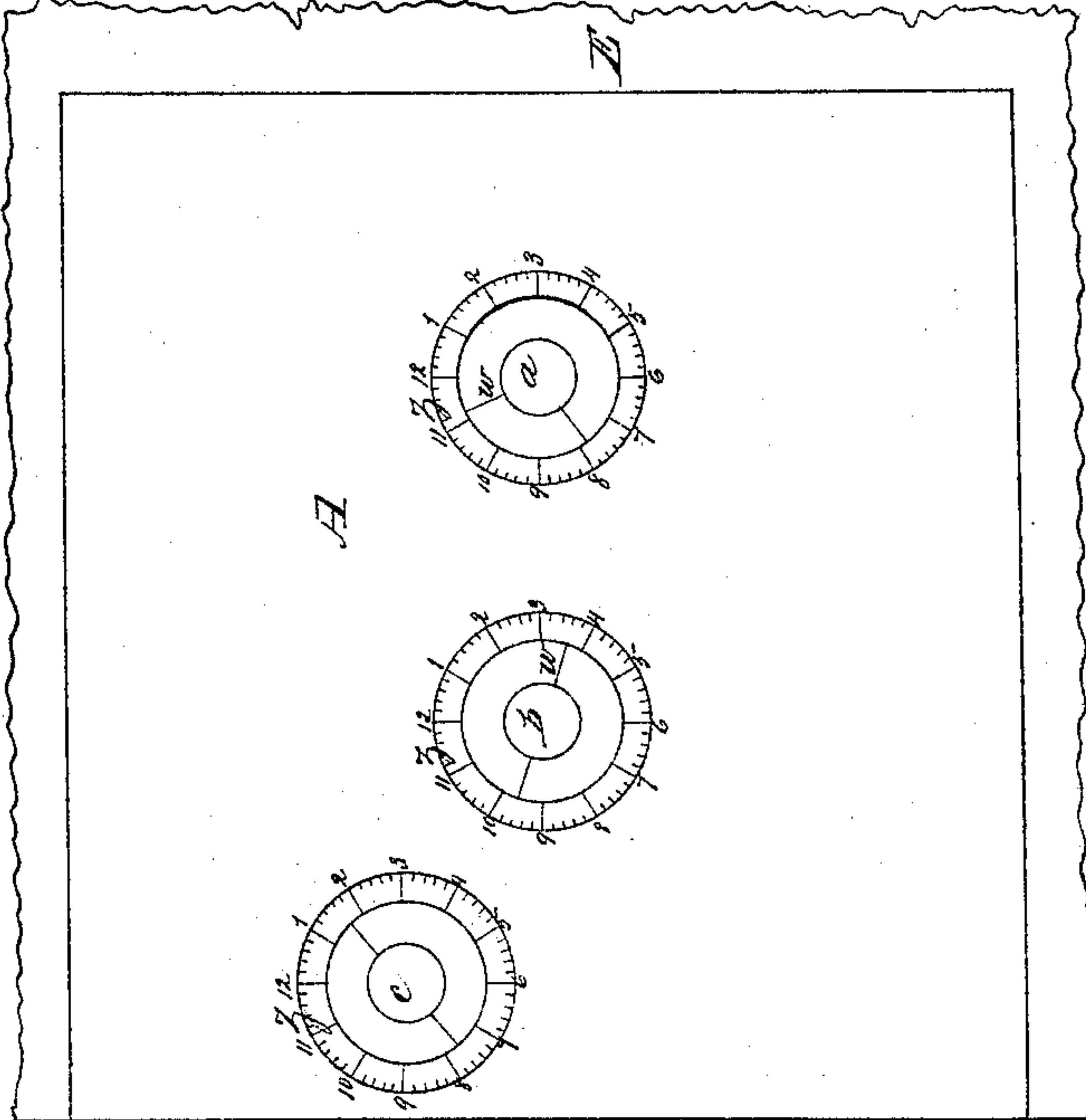
*N<sup>o</sup> 8,396.*

*Patented Sep. 30, 1851.*

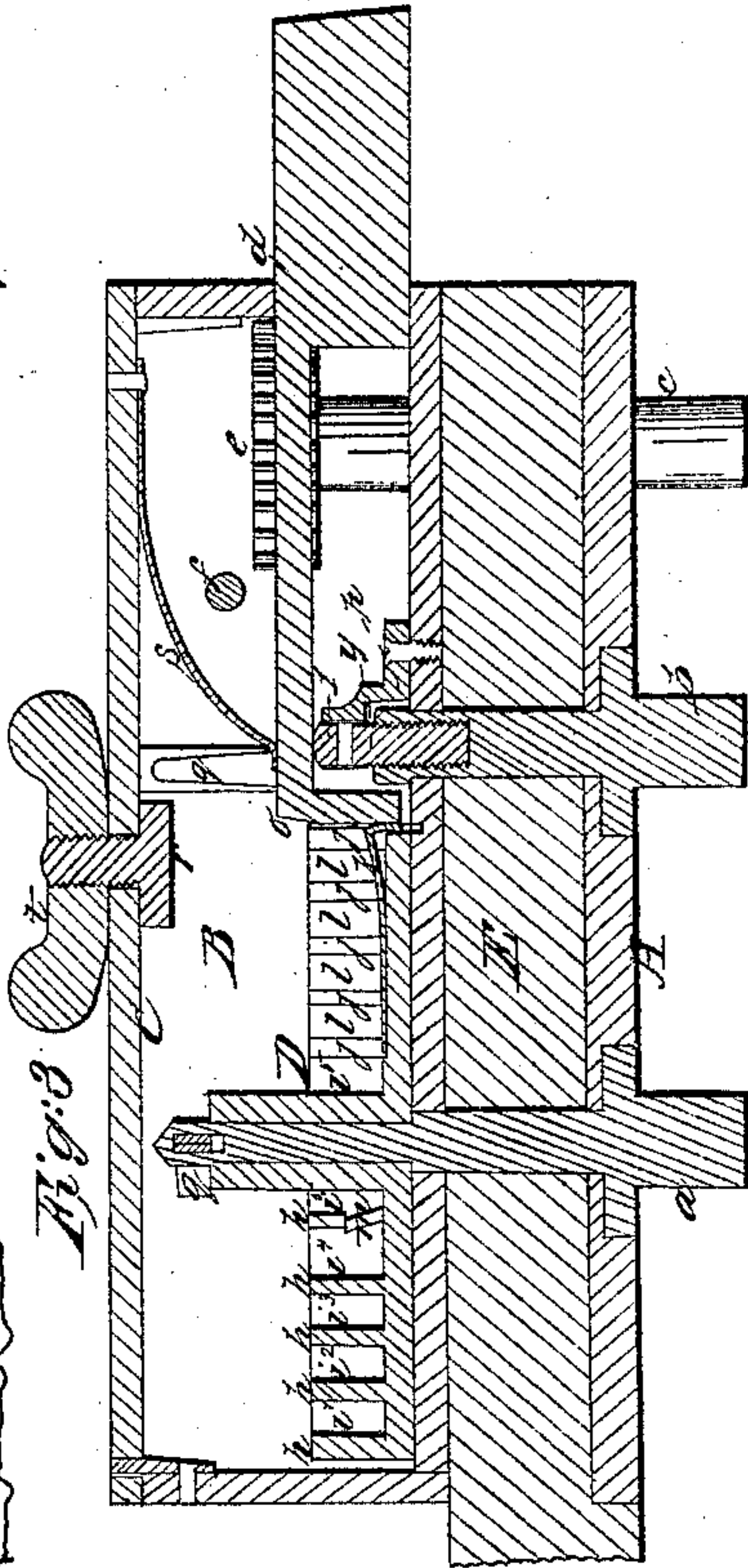
*Fig. 2.*



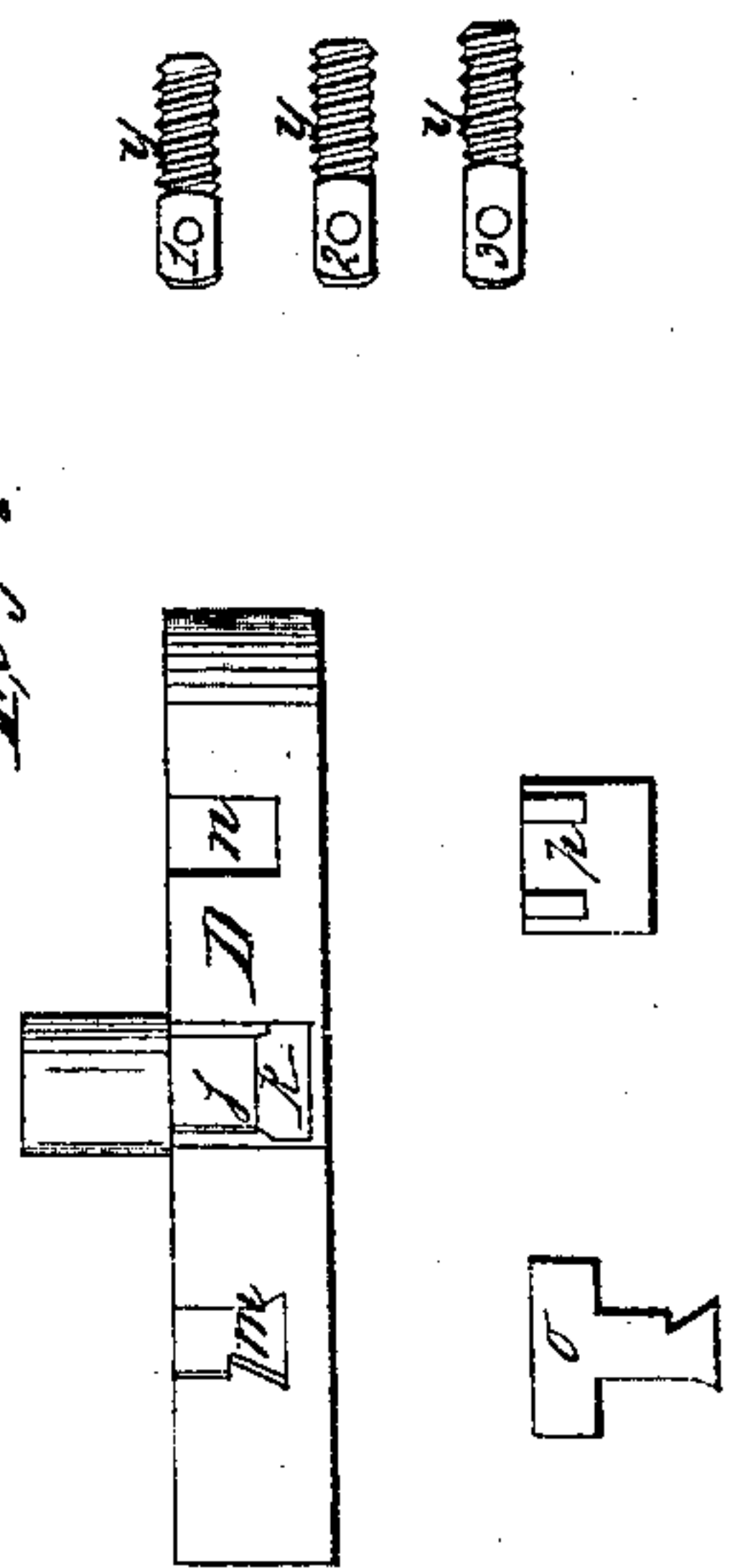
*Fig. 1.*



*Fig. 3.*



*Fig. 4.*





# UNITED STATES PATENT OFFICE.

THOS. NICHOLSON, OF FALMOUTH, VIRGINIA.

## MAZE-LOCK.

Specification of Letters Patent No. 8,396, dated September 30, 1851.

*To all whom it may concern:*

Be it known that I, THOMAS NICHOLSON, of Falmouth, in the county of Stafford, in the State of Virginia, have invented a new and Improved Lock for Doors, Safes, &c., which I call the "Confidence-Lock;" and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1, is a view of the outer plate of the lock; Fig. 2, view of the main portion of the lock, the removable cover being taken away; Fig. 3, a longitudinal section in the line *z*, of Figs. 1 and 2; and Fig. 4, detached portions of the lock.

Like parts are designated by like letters in the several figures.

My lock consists of two principal parts, viz., the outer plate A, placed on the outside of the door E; and the lock proper B, on the inside of the door immediately opposite the plate A. The two parts are united together by bolts *u*, *u*, &c., countersunk in the outer plate A, and fastened by nuts and screws on the inside of the door. The two portions A, B, communicate with one another only by the revolving bolts *a*, *b*, *c*, which are the only means of locking and unlocking, a key and key-hole being entirely dispensed with.

The plate A, is made of hardened steel or case-hardened iron; and, having no accessible apertures, at the same time protecting the portion of the door E, occupied by the lock B, inside, it effectually secures the lock from the effects of violence. The said bolts *a*, *b*, *c*, project outward sufficiently to be grasped by the fingers when they are to be used. The inner ends are connected with the several portions of the lock to be moved in locking and unlocking as hereinafter described.

The lock proper B, is entirely incased in metallic sides, of which the inner side C, is removable at pleasure from the inside of the door, to enable access to be had to the inside of the lock when desired. The spring *s*, and guide *g*, are attached to this removable side or cover.

The fastening bolt *d*, is moved by being geared to a small cog-wheel *e*, attached to, and turning with, the revolving bolt *c*. It is kept from moving sidewise by the guides *f*, *g*, and held down by the spring *s*. Its inner end *o*, bends down at right angles to itself, and is shaped into any desired form.

A disk D, is attached to the inner end of the revolving bolt *a*, secured upon it by having a square aperture fitting accurately over the bolt formed, at this end, into a similar size and shape, and is held thereon by a spring-key *q*. Said disk has a number of concentric ledges *h*, *h*, &c., rising perpendicularly from its face, the outer ledges corresponding with the periphery of the disk, and the others within being at equal distances each from another, and sufficient to admit the end *o*, of the fastening bolt *d*, therein. Through one side of said ledges and in the same radial line are formed openings *j*, *j*, &c., equal in extent to the width of said bolt-end *o*. A spring *k*, is fitted into the bottom of the passage formed by said openings, making an inclined plane so that the bolt may slide from center to circumference but not back again. In the spaces between the said ledges, stops *l*, *l*, &c., are inserted on both sides of the passage formed by the openings *j*, *j*, &c., and at such other intervals as may be desired, in order to render the maze thus formed as intricate as possible. In to some of the divisions thus produced false communications *n*, *n*, &c., may lead, in order to mislead and confuse any one who may improperly attempt to open the lock. Into other divisions true communications *m*, *m*, &c., conduct, having a shape and size exactly corresponding with the bolt-end *o*, and at different heights from the surface of the disk. Several disks differing in arrangement may be provided for each lock.

A number of screws *y*<sup>1</sup>, *y*<sup>2</sup>, &c., exchangeable at pleasure are provided, and fit into a female screw in the inner end of the bolt *b*. Their heads are square, and slide within a guide *p*, which prevents their turning and thereby causes them to rise and sink on turning the bolt *b*. The screws are immediately under the fastening bolt *d*, and by rising and sinking regulate the bolt *d*, to the height desired to enable the bolt-end *o*, to enter the several communications *m*, *m*, &c. They are all of different lengths and consequently require each a different amount of movement to accomplish the same purpose.

When unlocked, the bolt-end *o*, is in the inner space *i*<sup>5</sup>; and to lock again it is only necessary to turn the disk D, around till the bolt-end *o*, comes opposite the openings *j*, *j*, &c., when the fastening bolt *d*, is to be drawn out by turning the bolt *c*. As soon as it is drawn completely out it passes the spring



$k$ , and is forced down by the spring  $s$ , while the spring  $k$ , rises and prevents the fastening bolt returning. Hence, to unlock again the bolt-end  $o$ , must return by the  
 5 communications  $m, m$ , &c., through the several ledges  $h, h$ , &c., to the inner space  $i^5$ . Any one not acquainted with the exact movements required, would naturally, on trial, enter the bolt-end  $o$ , through some one of the  
 10 false communications  $n, n$ , &c., which are of sufficient size and formed to admit the said bolt-end  $o$ , at any height, while the true communications  $m, m$ , &c., admit the bolt-end only at certain determinate heights.  
 15 The said false communications  $n, n$ , &c., open to spaces having no exit but the communications which lead to them from the outside of the disk; and consequently the bolt  $d$ , when once admitted therein, cannot  
 20 be moved farther in, but must return by the way through which it entered.

It is obvious that to open the lock the exact movement of the disk  $D$ , and the screw  $y'$ , must be ascertained previously, by actual  
 25 observation; and that each position of each disk on the bolt  $a$ , requires a different movement of the bolt  $a$ ; and that each screw  $y'$ ,  $y^2$ , &c., requires a different movement of the bolt  $b$  for each position of each disk  $D$ .

30 The movements of the bolts  $a, b$ , are regulated and determined by arrow-indexes  $w, w$ , on their outer ends, which direct to graduated circles  $z, z$ , on the outer plate  $A$ ; each divided into twelve equal divisions, which  
 35 are again subdivided into five minutes each.

The bolt  $c$ , is only used for moving the fastening bolt  $d$ , and in each case turns as far as permitted, in reverse directions according as the fastening bolt  $d$ , is to be  
 40 moved outward or inward. The index and circle for bolt  $c$ , are not used, and may be omitted; their only utility being to mislead one unacquainted with the construction of the lock, who should attempt to open it. In  
 45 using indexes  $w, w$ , either end may be used to designate the movements, and they are turned right or left according to circumstances to be ascertained in each particular case.

50 The positions of the disk  $D$ , may be changed from time to time. The number of positions of each disk depends on the number of sides of the regular polygon which forms its central aperture. In the  
 55 accompanying model, this aperture being a square, the number of positions is four, marked 1, 2, 3, 4, on the disk and designated

by a pointer on the inner end of the bolt  $a$ . The screws  $y', y^2$  &c., are also to be exchanged from time to time as desired, thus  
 60 forming a new set of combinations with each screw.

In order to open the lock, keys must be prepared before-hand for each permutation formed by changing either disk, position, or  
 65 screw; to be prepared by actual trial and recording the movements.

In the accompanying model only one disk  $D$ , having four positions; and three screws  $y', y^2, y^3$ , are provided, having together  
 70 twelve permutations each requiring a distinct key. I herewith give the key of one permutation as an example to show the manner of working the lock. The disk  $D$ , is supposed to be in the position marked "1,"  
 75 and screw  $y'$ , employed. The fastening bolt  $d$ , is also supposed to be drawn in as when unlocked. The feathered end of the indexes  $w, w$ , are to be employed in directing the movements in this instance:—1st, bolt  $a$ ,  
 80 either way to  $1\frac{1}{2}$  mins. before 9; 2nd, bolt  $b$ , to left from extreme right three revolutions, and to 3 mins. after 12; 3d, bolt  $c$ , to left as far as it will go; 4th, bolt  $a$ , to right to 2 mins. after 10; 5th, bolt  $b$ , to left to 1 min.  
 85 before 8; 6th, bolt  $c$ , to left as far as it will go; 7th, bolt  $a$ , to right to 1 min. before 12; 8th, bolt  $b$ , to right to 3 mins. after 1; 9th, bolt  $c$ , to left as far as it will go; 10th, bolt  $a$ , to right to  $1\frac{1}{2}$  mins. before 6; 11th, bolt  $b$ ,  
 90 to right as far as it will go; 12th, bolt  $c$ , to left as far as it will go; 13th, bolt  $a$ , to left to  $1\frac{1}{2}$  mins. after 2; 14th, bolt  $c$ , to left as far as it will go, when the lock will be found to be unfastened. To lock again turn bolt  $a$   
 95 either way to 1 min. before 8; then turn bolt  $c$ , to right as far as it will go. The other permutations have similar movements, and their keys are readily prepared by the owner  
 100 of the lock.

What I claim as my invention and desire to secure by Letters Patent is—

The disk  $D$ , with its concentric and radial passages, or their equivalents, in combination with the bolt-end  $o$ , operated substan-  
 105 tially in the manner and for the purposes herein described.

The above specification of my improved confidence lock for doors, safes, &c., signed by me this day, the 13th of Augt. 1851.

THOMAS NICHOLSON.

Witnesses:

R. F. COLEMAN,  
 WM. W. MITCHELL.