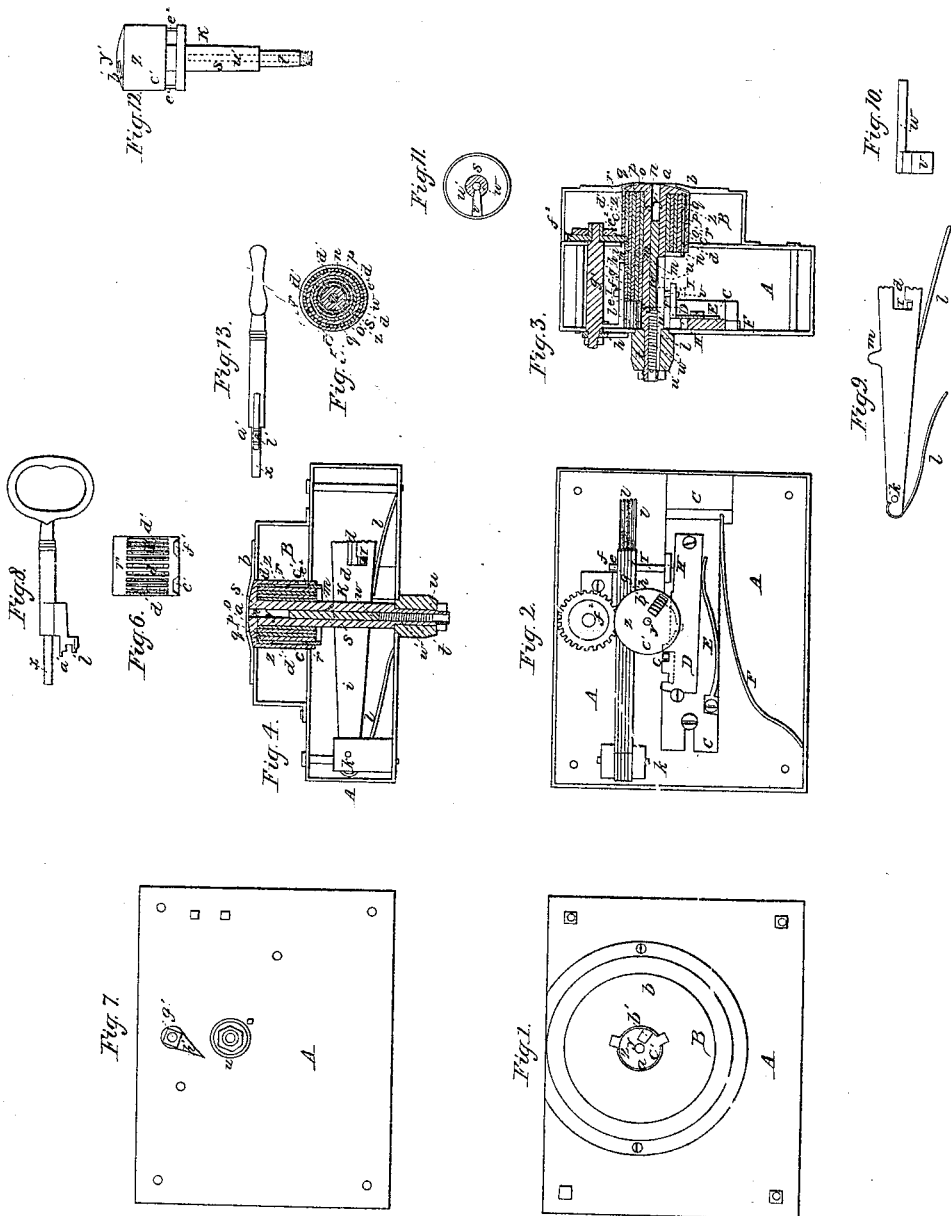


# E. B. Horn, Lock.

N<sup>o</sup> 6,733.

Patented Sep. 25, 1849.



# UNITED STATES PATENT OFFICE.

EDWIN B. HORN, OF BOSTON, MASSACHUSETTS.

## DOOR-LOCK.

Specification of Letters Patent No. 6,733, dated September 25, 1849.

*To all whom it may concern:*

Be it known that I, EDWIN B. HORN, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new or  
5 Improved Powder-Proof Protection or Safety Lock for Doors; and I do hereby declare that the same is fully described and represented in the following specification and accompanying drawings, letters, figures,  
10 and references thereof.

Of the said drawings Figure 1, denotes an external view of the said lock. Fig. 2 is a view of it as it appears with its cover plate removed from the case. Fig. 3 is a  
15 vertical and transverse section of it taken through the permanent or fixed key tumblers and series of concentric depression tubes, to be hereinafter described. Fig. 4, is a horizontal and longitudinal section of it taken through the permanent key. Fig. 5, is  
20 a section of the concentric depressing tubes taken perpendicular to their common axis. Fig. 6, is an external view of the indented concentric wheel tube, to be hereinafter explained. Fig. 7, is an elevation of the rear  
25 side of the lock. Fig. 8, is a side view of the movable key. Fig. 13, is an edge view of it.

A, in the said drawings represents the lock case; B, a cap or box but which in general  
30 may be dispensed with, as the outer plate of an iron safe door may be used instead of the circular plate *b*, of the said cap, the said plate of the door being made with a passage through it, similar to the passage *a*, as made  
35 through the cap plate *b*.

C, is the main bolt which with its spring tumbler D, is made and applied to the lock case, and operates in connection with a stationary stud *c*, in substantially the same  
40 manner as similar parts in other locks.

E, is the spring of the tumbler D, while F, is a friction spring applied to the main bolt.

From a standard H, extending perpendicularly from the main bolt a pin I projects  
45 at right angles and operates in connection with a recess or passage *d*, made in each one of a series of any suitable number of tumblers or levers *e, f, g, h, i*, arranged or disposed with respect to the main bolt and its  
50 pin I, as seen in the drawings. A side view of one of these tumblers is represented in Fig. 9, the whole series being made to turn on one common and stationary pin or fulcrum *k*. One or more elevating springs *l, l*,  
55 and a stud or projection *m*, are fixed to each

tumbler as seen in Figs. 4 and 9, the spring or springs being so applied to it as to press it toward the rotary series of concentric depressing tubes to be described. On each projection *m*, one of a series of concentric depression tubes *n, o, p, q, r*, is made to rest—  
60 that is to say the lower edge of the tube is placed on the projection, so that to each of the tumblers or levers *e, f, g, h, i*, there is depression tube. This cluster or series of  
65 tubes is placed on the shank or shaft *s*, of the permanent key K, the said shank or shaft being supported (by means of a journal *t*,) in a long bearing *u*, fixed to or made to project from the lock case; the journal of  
70 the shank being so applied as to permit the key shank to be freely rotated on its axis. The shank *s*, is made hollow and has a long groove or slot *u*, cut longitudinally through its side, the key head or bit *v*, being made to  
75 pass transversely through the slot, while a slide *w*, to which it is affixed is placed within the hollow part of the shank, the key bit and its slide being seen in side view in Fig. 10, and in end view in Fig. 11, which is a  
80 cross section of the key shank and made to exhibit the bit and its slide. Below the bit and within the shank, is a helical spring *w*, which presses the bit toward the series of depressing concentric tubes, and throws it  
85 beyond the main bolt or out of action with it, whenever the movable or opening key (Fig. 8) is out of the lock. When the said key is inserted in the lock the cylindrical projecting part *x*, is made to enter the aperture  
90 *y*, of the head or socket plate *z*, (which covers the series of concentric tubes) and to meet and press down the slide *w*, and the bit attached to it, and so as to move the said bit into the proper position for acting  
95 against the main bolt when the key is next revolved. At the same time that the pin or part *x*, is inserted in the aperture *y*, of the permanent key, the part *a'* of the movable key passes into a rectangular opening *b'*,  
100 made through the head plate *z*. The part *a'*, being properly formed like the bits of a common key, is intended to depress each of the circular concentric tubes, to such a distance as will enable the pin I, to pass into  
105 or out of the recess *d*, of the tumbler a lever connected with the said concentric tube the aperture *b'*, being arranged so that the part *a'* can act against the whole series of concentric tubes. As the head plate *z*, is firmly  
110

fixed to the shank of the permanent key, the aperture  $b'$ , when it receives the part  $a'$  constitutes a means of so connecting the permanent and movable keys, as to enable a person (when his hand is applied to the latter and he puts it in revolution) to simultaneously revolve the permanent key so as to either throw the main bolt forward or backward as the circumstances may require. The head or socket plate forms the cap of a concentric tube or cover  $c'$  which extends over and incloses the series of concentric depressing tubes before mentioned.

As an additional security to the lock or means of preventing it from being opened by any person who may have become either properly or improperly possessed of a duplicate key, I employ mechanism as follows: The outer tube  $r$ , (which I term the indented wheel tube) of the series of concentric depression tubes has parallel scores or slots  $d$ ,  $d'$ , &c., cut through it at equal distances apart and parallel to its axis, as seen in Fig. 6. It also has one or more recesses or notches  $e'$ ,  $f'$ , made in its lower edge as seen in the said Fig. 6. A slot or passage  $e^2$ , is cut through the covering tube  $c'$ , as seen in Fig. 12, which represents a side view of the said tube  $c'$ . Through the said slot a gear wheel  $f^2$  passes and so that its teeth shall work into the slots  $d'$ ,  $d''$ , the said gear wheel being placed outside the lock case and fitted on an axis  $g'$ , which passes through the said case and on which, viz. outside of the lock case there is an index pointer  $h'$ , by which in connection with any mark or marks on the case the position of either of the notches  $e'$ ,  $f'$ , may be determined or regulated. Now should we desire to prevent a person who may have another key, from opening the lock with it, we, by means of the index pointer, so turn the indented wheel tube, that, whenever the key is inserted in the lock, and an attempt is made by means of said key to force back the main bolt one of the notches  $e'$ ,  $f'$ , or the single notch provided there be but one of them, shall be moved or brought into such a position as to cause the stud  $m$ , of the lever or tumbler which acts directly under the said wheel tube, to enter or pass into the notch. In consequence thereof, it will be impossible to depress the said lever far enough to enable the bolt to be retracted. Before the bolt can be shot back the index pointer must be moved into the correct position, or one such as will carry the notch out of action with the stud of the lever when the bolt is being either moved forward or backward. It will however be seen that the index pointer cannot be got at when the door is closed or locked. Therefore in order to open the lock we must have the key made with a movable bit  $l'$ , which can be taken off or removed from the others. We take off

this movable bit and supply its place with a longer one, such as will cause the lever or tumbler when the stud  $m$ , is in the notch of the wheel tube to be depressed to the proper distance, to enable the pin  $I$ , to pass into the recess of the lever and so as to enable the bolt to be shot back. The key therefore by which the lock can be opened is so changed from that in possession of the person whom we desire to prevent from opening the lock, that our object is easily and thus accomplished.

The lock constructed in the manner essentially as above described becomes a powder proof lock, or one in which there is no passage or opening, by which when the lock is affixed to a door a burglar or other person can conveniently insert gun powder or any other explosive compound or material. The series of concentric depression tubes enables me to open the lock, by a partial revolution of the key and in this respect they render my lock a great improvement on many other powder proof locks.

The particular object of having the bit of the permanent key movable on the shank and acted upon by a helical spring as hereinbefore described is to furnish an additional security against the attempts of any person or burglar to make a key to fit the lock, for in order to do so it will be seen that he has to construct the part  $a$ , of the movable key of a proper length with respect to the bit which operate the depression tubes and this length he will be obliged to find out by experiments, the probability of his determining it being very small.

I do not limit my invention to the precise form or forms of any or all of the parts thereof, but intend to vary the same in any manner and to any extent so long as I do not substantially change the peculiar parts or combinations claimed as new.

What I claim is—

1. One or more concentric depressing tubes  $n$ ,  $o$ ,  $p$ ,  $q$ ,  $r$ , as combined with the series of tumblers and internal or permanent key  $K$ , and made to operate therewith and by means of the external key (Fig. 8) substantially as hereinbefore described.

2. I also claim, the mode of making the internal key  $K$ , viz., with the socket in the shank and the movable bit and spring applied to the said socket the whole being substantially in manner and for the purposes as above set forth.

3. I also claim, the indented or concentric wheel tube and its gear or turning mechanism in combination with the series of (or one or more) concentric depression tubes, and its and their tumblers substantially in manner and for the purpose as specified; the said wheel tube being constructed with one or more recesses or notches for the reception of the projection of its tumblers un-

der the circumstances and for the purpose as described.

4. I also claim, the head or socket plate z, in combination with the fixed key shank and the series of concentric depressing tubes substantially as specified; the same serving to cover and protect the ends of the concentric tubes, and to lock or connect the permanent and movable keys together so as to

enable the latter to turn the former all as 10 hereinbefore explained.

In testimony whereof I hereto set my signature this fourteenth day of August, A. D. 1849.

EDWIN B. HORN.

Witnesses:

R. H. EDDY,

FRANCIS GOULD.