A.D. 1842 . . . . N° 9395.

Locks and Keys.

WILLIAMS' SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, William Morrett Williams, late of the Royal Military College, Professor of Mathematics, and now of Bedford Place, Commercial Road, in the Hamlet of Mile End Old Town, in the County of Middlesex, and of No. 163, Fenchurch Street, in the City of London, Lock Manufacturer, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent under the Great Seal of Great Britain, bearing date at Westminster, the Thirteenth day of June, in the fifth year of Her reign, did give and grant unto me, the said William Morrett Williams, my ex̃ors, adm̃ors, and assigns, Her especial licence, full power, sole privilege and authority, that I, the said William Morrett Williams, my ex̃ors, adm̃ors, and assigns, and such others as I, the said William Morrett Williams, my ex̃ors, adm̃ors, or assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term of years therein expressed, should and lawfully might make, use, exercise, or vend, within that part of the United Kingdom of Great Britain and Ireland called England, the Dominion of Wales, and the Town of Berwick-upon-Tweed, and also in all Her Majesty's Colonies and Plantations abroad, my Invention of "Certain Improvements in the Construction of Locks and Keys, which I call or denominate 'Williams' Lock and Key Improved';" in which said Letters Patent there is contained a proviso that I, the said William Morrett Williams, shall particularly describe

and ascertain the nature of my said Invention, and in what manner the same is to be performed, by an instrument in writing under my hand and seal, to be inrolled in Her said Majesty's High Court of Chancery, within six calendar months next and immediately after the date of the said in part recited Letters Patent, as in and by the same, reference being thereunto had, will more fully and at large appear.

NOW KNOW YE, that in compliance with the said proviso in the said Letters Patent, I, the said William Morrett Williams, do hereby declare the nature of my said Invention, and the manner in which the same is to be performed, is particularly described and ascertained in and by the following Instrument in writing (reference being had to the letters and figures therein contained, and to the Drawings thereunto annexed) :—

The peculiar mechanism of this my lock and key improved consists in a certain arrangement and disposition of the various different parts or pieces composing my lock and key, so as by such composition to produce more perfect security, a greater degree of simplicity and ease in construction, and thereby to enable the lock and key, in their different applications and modifications, to be made or manufactured at a cheap or low price. Locks and keys are of many different shapes, and applicable for many different purposes, yet nearly all that are used for like purposes contain some similar parts or pieces of mechanism, so my lock and key improved may be said to partake of the like similarity. I shall therefor describe and explain the several parts of my lock and key, and show, by the arrangement and combination of the various machinery and apparatus which I use, how the effects of locking and unlocking my lock are produced by the application of the key.

Figure (1) is a representation of the outside of the front plate of a draw lock, differing from other draw locks by having no key hole or place for the insertion of a key, and thereby preventing dust or dirt from entering into the lock. But, instead of a key hole, will be perceived a projecting rectangular piece of metal A, with three round holes *a*, *b*, *c*. These holes are to receive into them and exhibit at their surface what I call the tail ends of three stops, being the exact number of stops contained in each of my locks. In this draw lock, as in some locks used for other purposes, these stops are placed in a longitudinal order or direction, but they may be placed in a triangular or other form, according to the description or sort of lock for which the stops are required.

Figure (2) is a representation of the inside or interior of a draw lock, the back plate being removed for the purpose of exhibiting the parts within. In this same Figure (2) *w*, *x*, *y*, *z*, represent the edges of a four-sided frame enclosing the parts. B represents the bolt of the lock, which is similar in shape to that of other draw locks, except having on one edge of the bolt a rack or series of teeth *n*, *n*, *n*, which are seen more plainly in the detached Drawing, Figure (3). In Figure (2) the bolt B is exhibited in its unlocked position.

In Figure (5) the bolt B is exhibited in its locked position, the bolt head having been shot or forced through or past the bolt hole of the frame in the side marked *w*. In the action of locking or unlocking, the tail end of the bolt B slides on a runner with a guide screw and socket *f*, similar to the bolts of other locks used for similar purposes. D is a driver, and *m* is the driver spring. *q* is a feather spring. Each of these are represented in Figure (2), and they are similar to those commonly used for like purposes in other draw locks.

Figure (4), L, M, N, represent the flat sides or shapes of the three stops, of which the tail ends are represented at *a*, *b*, *c*, in the rectangular projection A, Figure (1). In the upper edges of these stops L, M, N, Figure (4) are notches or slots at different and irregular distances from each other. And it will be observed that one notch or slot in each of the stops is long or deep, and that all the other notches or slots are short and only cut half way through the stops; these I call false notches. It will also be observed that the stop N, Figure (4), is cranked, or that it has two flanges at right angles to each other, and that one of the flanges has a wedge or tooth-like form or shape. The stop N, I call a relieving stop. The head ends or edges of these stops are seen at *e*, *e*, *e*, in Figures (2) and (5). R, Figure (5), represents the rack box screwed or fastened to the lock plate, so that the teeth *n*, *n*, *n*, *n*, in the edge of the bolt B, may fit into the recesses or open spaces of the rack box R.

Figure (6) represents two detached appearances or positions of the rack box R, when it is removed from the lock plate. The position G shows the recesses or open spaces in which the stops L, M, N, Figure (4) slide backwards and forwards. In the position H the rack box R is seen in perspective, and it shows a longitudinal grove *o*, *o*, *o*, *o*, cut in the upper edges of the racks, and through which groove the teeth *n*, *n*, *n*, *n*, in the bolt B, are made to slide or pass in the acts of locking and unlocking.

S, Figure (7), represents a comb or forked spring having three prongs. This spring is screwed or fastened to the lock plate, the prongs being or laying across the bolt B, and the ends of the prongs being or pressing against the edges *e*, *e*, *e*, Figure (2), of the stops L, M, N, Figure (4).

T, Figure (8), is a side view of the comb or forked spring S, Figure (7), showing its shape or form when used in the lock.

K, Figure (9), represents the key or instrument by which the actions of locking and unlocking are produced. K is the appearance of the key fitted up for use, with its case and bow, or handle and swivel part.

Q, Figure (10), is a representation of the key detached from its bow handle and swivel part, and also with the case removed or taken away in order to exhibit the plugs 1, 2, 3, 4, 5. It will be observed that the plugs 1, 2, and 3, are each of different lengths, and that the plug 4 is exactly of the same length as the plug 3, and that the plug 5 is exactly the same length as the plug 2.

Having now described the several parts or pieces composing the mechanism of my lock and key, improved in its application to a draw lock, I will now explain how and by what means the key is made to produce or cause the actions of locking and unlocking, and also show the difficulty and almost impossibility of picking or opening the lock without the application of the proper key.

Figure (11) is a view or section of the rack box R, with the stops L, M, N, placed or put in the recesses or open parts of the rack box. *a*, *b*, *c*, are the tail end of the stops, and they pass through the three holes in the rectangular projection A, Figure (1). Now, when the lock is quiescent, either in its locked or unlocked position, these tail ends *a*, *b*, *c*, are always flush or level with the front part of the projection A. And it will be observed that the three long or deep notches *i*, *i*, *i*, in the stops L, M, N, are not in a line or even with the groove *o*, *o*, *o*, *o*, but that they are at unequal and different distances from the groove, while the stops are in this position in the rack box R, Figure (11); if then the bolt B, Figure (3), be placed over the groove *o*, *o*, *o*, *o*, the rack or series of teeth *n*, *n*, *n*, *n*, *n*, in the edge of the bolt, will be prevented by the stops from passing through the groove *o*, *o*, *o*, *o*. But if the plugs 4, 5, in Figure (10), be pressed against the tail ends *a*, *b*, of the stops L, M, they will be pressed or forced forwards in the recesses of the rack box R, exactly to such a distance as will bring the deep notches *i*, *i*, in a straight line, as seen in Figure (12), and thereby allow the teeth *n*, *n*, *n*, *n*, in the bolt B, to pass through the deep notches in the stops L, M, and also at the same time to pass through the groove *o*, *o*, *o*, *o*, in the rack box R; and this motion will be given or this effect will be produced on the bolt B, by means of the driver D, Figure (5), being forced by its strong spring *m*, Figure (5), and thus cause the head of the bolt B to shoot or pass through the bolt hole in the side *w* of the frame *w*, *x*, *y*, *z*, Figure (5), inclosing the parts of the lock. But when the plugs 4, 5, Figure (10), are withdrawn and are not pressing against the tail ends *a*, *b*, of the stops L, M, then the stops will be forced back into their original quiescent position in the recesses of the rack box R, by means of the ends of the comb or forked spring S pressing against the ends *e*, *e*, *e*, Figure (2), of the stops L, M, N, Figure (4). Again, in order to produce the action or effect of unlocking, it will be necessary to reserve the key K, Figure (9), and instead of pressing the plugs 4, 5, Figure (10), the plugs 1, 2, 3, Figure (10) must be pressed or forced against the tail ends *a*, *b*, *c*, of the stops L, M, N, and they will (as they were in the act of locking) be pressed forwards in the recesses of the rack box R, exactly to such a distance as will bring the deep notches *i*, *i*, *i*, in the stops, in a straight line, as shown before in Figure (12), and thereby allow the teeth *n*, *n*, *n*, *n*, in the bolt B, to shoot or pass through the deep notches *i*, *i*, *i*, and also through the grove *o*, *o*, *o*, *o*, in the rack box R; and this effect will be produced, or this motion will be caused or given to the bolt B, by means of the feather spring *q*, in consequence of the force or power of the strong spring *m* being suspended or taken away from pressing against its driver D, by the plug 1, in the key K, pressing against the tail end *c* of the relieving stop N, as shewn in Figure (13), and causing the head of the bolt B Figure (2), to shoot back or pass through the bolt hole in the side *w* of the frame *w*, *x*, *y*, *z*, Figures (2 and 5), inclosing the parts of the lock. I now again observe that in each of the three stops in this my lock and key improved, there is one deep or long notch or slot, and also any number of short or false notches or slots that the size of the stop will admit; and that the action of locking and unlocking depends upon pressing or forcing forwards each of the stops to the exact or precise distance required, and so as to bring all the deep or long notches or slots into one line, or in coincidence, in order to admit or permit the bolt with its teeth to pass freely through the notches, and through the groove in the rack box at one and the same moment of time. So also the short notches or slots in the stops, which are false ones, will render it almost impossible to ascertain which are the right notches without the application of a key having plugs of the exact required lengths, and it will be easily perceived that the short or false notches do render it extremely difficult and almost impossible to pick or open the lock.

Having described and shown by the novel arrangement and disposition of the several parts and mechanism of which my lock and key improved is composed, in their application for the purpose of a draw lock, and for almost every other sort of cabinet lock, I shall now proceed to explain and exemplify by Drawings, and references thereto, how the like principle of security and utility may be carried out and modified, so as to allow a key having a rotatory or rotary motion similar to the turnings round of the keys of other locks, at the same time producing the actions or effect of locking and unlocking.

Figure (14) is the outside or front plate of a door or rim lock, differing in appearance from the front plate of the draw lock, Figure (1) by having as represented at P, Figure (14), a round or cylindrical projecting piece of metal with the three round holes *a*, *b*, *c*, placed in a triangular form. These holes are to receive the tail ends of three stops, similar in shape and use to those described, L, M, N, Figure (4).

Figure (15) represents the inside of the door lock, the back plate having been removed for the purpose of exhibiting the parts within. *w*, *x*, *y*, *z*, Figure (15) represent the edges of a four-sided frame or rim inclosing the parts within the lock. B, Figure (15), is the bolt, similar in shape to that of the bolts commonly used in other door or rim locks, except in having in the under or bottom edge two pieces, *t*, *v*, cut out, with a tongue piece T, projecting downwards, and separating the cuts *t*, *v*. In the locked and unlocked positions of the bolt it will have similar appearances to those exhibited in Figures (2) and (5). The tail end of the bolt of a door lock slides on a runner, and is guided in its motion by a screw and socket, in a similar manner as described Figure (2). E, Figure (16), represents a notch plate, having a circular hole or piece cut out in the centre to fix and admit the cylindrical projecting piece of metal P, Figure (14), to pass through it and turn round easily. There are also three notches *d*, *e*, *f*, or pieces cut out in the notch plate, at three equal distances in the circumference of the circular hole. Instead of the rectangular rack box R, Figure (6), described in the draw lock, there is used in the door lock a cylindrical rack box, of which Figure (17) is a view when removed or taken out of the lock. P is the part projecting through the front lock plate Figure (14). In this view of the cylinder, Figure (17), only two of the stops L, M, can be seen with their deep notches or slots *i*, *i*. There is also seen the short or false notches in the stops, and their tail ends *a*, *b*. In the door lock, as in other locks having a rotary motion in the key, there is no comb or forked spring used, but instead thereof the three stops are forced back when pressed forwards by the plugs described in the key K, Figure (19), by three spiral springs, of which only two, *g*, *h*, can be seen in the view Figure (17). Figure (18) is a representation or view of a key, having a rotary motion when used to lock and unlock. The stem and bow handle of this key are similar to those of other keys having a rotary or turning motion. C, Figures (27 and 18), is the outside appearance of a circular tube or case, to hide and protect the plugs 1, 2, 3, Figure (19), used for pressing forwards the tail ends of the stops L, M, N, into the recesses of the cylindrical rack box U. Figures (27 and 18) is a bit or piece of metal fixed at the extremity or end of the tube C, for the purpose of preventing the key from leaving or being drawn off the projecting part P of the cylinder until the action of locking and unlocking is completed, when the key may be drawn out of the scutcheon I, Figure (28), which scutcheon is screwed or fastened to the front plate of the lock. X, Figures 18 and 27, is a nick or cut in the tube at the opposite side to the bit. This nick is to admit a stub fixed in the lower part of the projecting piece P, Figure (17), by means of which nick and stub the key turns the cylinder and all its parts round. Figure (19) represents the key, the tub C being removed for the purpose of showing the three plugs 1, 2, 3, similar to those in Figure (10). Figure (20) is a circular movement plate, with its plug or talon V projecting from the side or edge of the circular plate, which is screwed or fixed to the bottom of the cylindrical rack box. At the bottom and in the centre of the movement plate is a projecting stub F, to guide the cylinder in its circular motion.

Having now described the several parts exhibited in the vertical section of the cylindrical rack box, Figure (17), containing in its recesses the stops L, M, with their long or deep notches, and their short or false notches, and their spiral springs and movement plate, with its projecting plug or talent V, and its stub F. I next observe, that *g*, Figure 21, is an inverted staple, with two screw holes 8, 9, for the purpose of fastening and screwing the staple to the inside of the lock plate underneath the cylinder. In the staple there are two other tapped screw holes, 13, 14, into which two screws pass and fit, and also first going through the holes 16, 17, in the notch plate, Figure (16), and thereby fasten the notch plate and the staple and the cylindrical rack box, with all its connected parts, between the two lock plates. Figure 21* is a section of Figure 21. Now if the plugs 1, 2, of the key K be pressed on the tail end of the stops *a*, *b*, they will be pressed forwards exactly according to the length of the plugs, and exactly so far as that the deep or long notches *i*, *i*, will become and be coincident and flush with the notch plate, and in such positions as to allow the notch plate to pass through the deep or long notches, and thus allow the cylinder to pass round, and by such motion the plug or talon V will pass against and press the tongue T, and thereby cause the bolt B to move forwards or shoot through the bolt hole in the edge *w* of the frame or rim of the lock, and also into the box staple of the lock, and so produce the effect of locking or fastening the lock, and permit the key to be withdrawn. Again, by applying the key, and pressing the tail ends of the stops as before, and turning the key the contrary way round, then the bolt B will move backwards from the box staple through the bolt hole, and produce the effect of unfastening or unlocking the lock.

Another modification of my lock and key improved is its application to secure a cock or tap commonly used for drawing off liquors from vats or casks. Having described and represented by Drawings, and by references thereto, the cylindrical rack box used in my locks that have a rotary motion, I next observe, that Figure (24) represents a cock or tap plug such as is commonly used, and forms a part of all cocks and taps, or the part that admits the liquor to flow out of the cask or vessel, or prevents it from flowing out of the cask or vessel. Now if the cross or T part of the plug be cut off at the line *q*, *r*, and the cylinder represented by Figure (25), with its several and connected parts, be fixed by screws or otherwise, instead or in the place of the cross or T part so cut off, then the cylinder, with the lower part of the cock or tap plug fastened to it, may be turned by a key having plugs (similar to the key used for my locks having a rotary motion) either to the right or to the left, and so as to admit or permit liquor in any vat, or cask, or other vessel, to be drawn or run off, or pass through the aperture of the cock or tap; and by a similar operation of turning to the right or to the left the liquor may at pleasure be stopped or prevented from running out, but by no other means than the application of a proper key, having plugs of the exact length for the purpose, made in a similar manner to the keys used for locking and unlocking my locks.

I have now stated and described the mode of constructing Williams' lock and key improved, and particularly described the new or improved parts thereof; but I do not claim all that I have described as my Invention. I claim, as part of my Invention and improvement, the peculiar use and construction of my cylindrical rack box, with its three stops having false notches in each of them, and the said rack box, having a rotary motion such as to enable the key to turn quite round before the key can be withdrawn from the lock after having performed the action of locking or unlocking.

I claim, as another part of my Invention and Improvement, the security produced by the use of three stops, each having false notches therein for the purpose of preventing the true ones being ascertained.

I claim, as another part of my Invention and improvement, the peculiar use and application of my cylindrical rack box, when applied or fixed in its upright position to a cock or tap plug, in the manner before described in this Specification, for the purpose of drawing off liquor from a vat, or cask, or other vessel, or for preventing liquor from being drawn off a vat, or cask, or other vessel. I have in my Specification described a draw lock and rim lock, and also a tap or cock lock; but the principles of my Invention are equally applicable to all descriptions of locks in general use, and I claim them accordingly.

In witness whereof, I, the said William Morrett Williams, have hereunto set my hand and seal, this Thirteenth day of December, One thousand eight hundred and forty-two.

WILLIAM MORRETT (L.S.) WILLIAMS.

Signed and sealed by the said William Morrett Williams, in the presence of

HENRY W^{M} LITTLER,
Clerk to Bower & Back, Chancery Lane.

AND BE IT REMEMBERED, that on the Thirteenth day of December, in the year of our Lord 1842, the aforesaid William Morrett Williams came before our said Lady the Queen in Her Chancery, and acknowledged the Specification aforesaid, and all and every thing therein contained and specified, in form above written. And also the Specification aforesaid was stamped according to the tenor of the Statute made for that purpose.

DREW.

Enrolled the Thirteenth day of December, in the year of our Lord One thousand eight hundred and forty-two.

LONDON:
Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1856.

FIG. 1.

Outside of Front Plate of Draw Lock

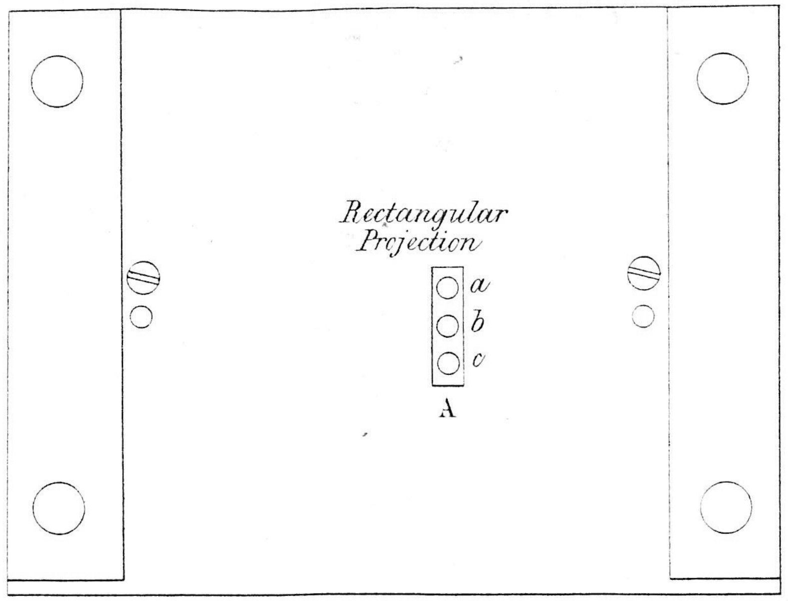
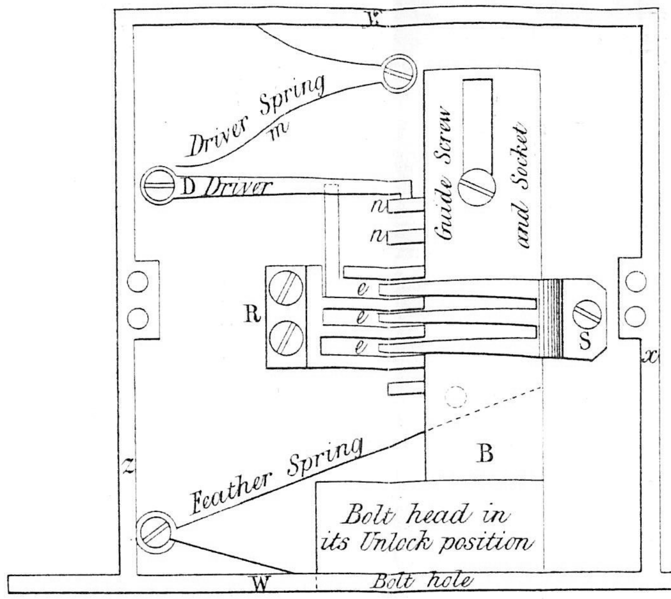


FIG. 2.

Inside or interior of Draw Lock



Inside of Draw Lock

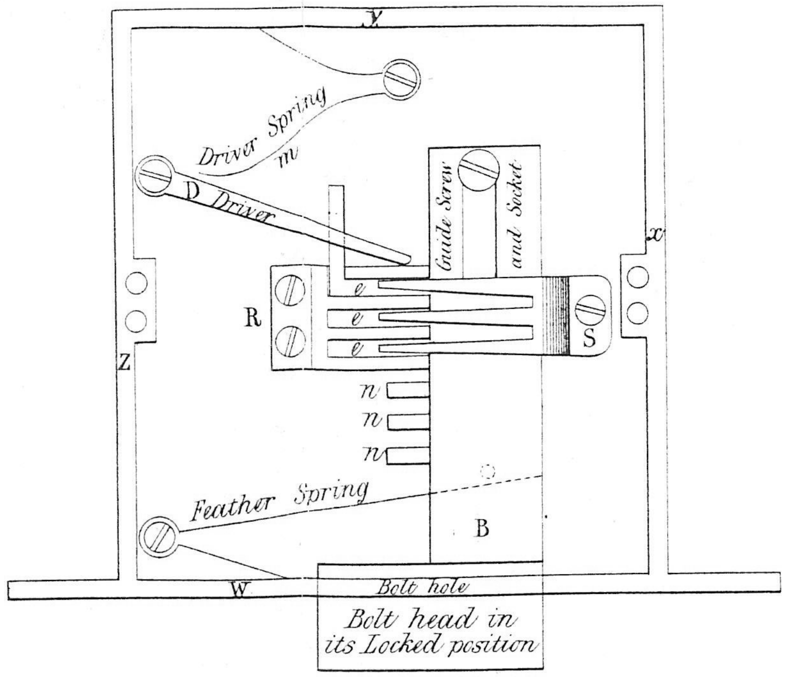


FIG. 3.

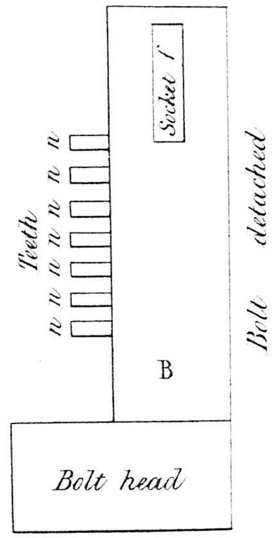


FIG. 4.

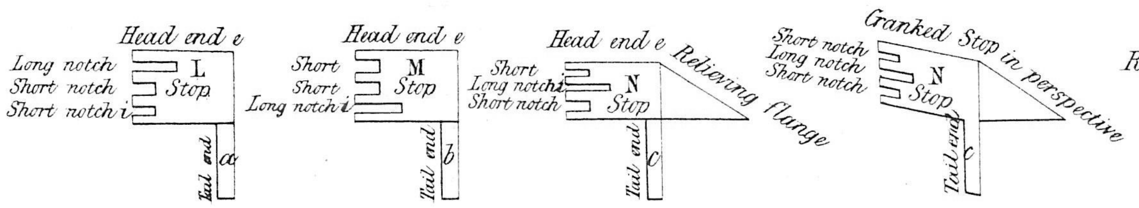


FIG. 6.

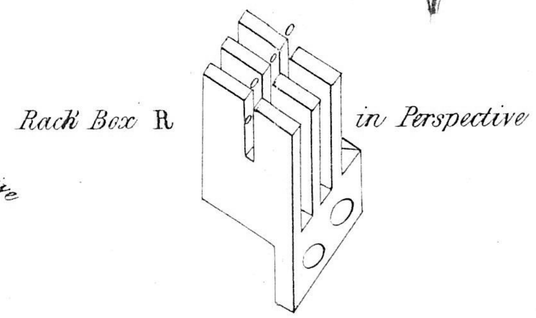


FIG. 6.

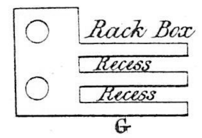


FIG. 6.

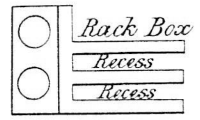


FIG. 7.

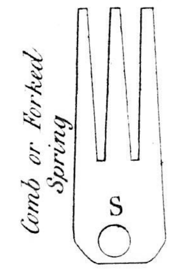


FIG. 8.

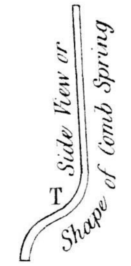


FIG. 9.

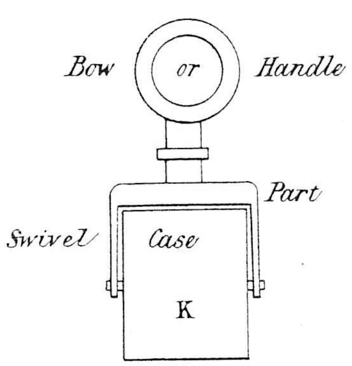


FIG. 10.

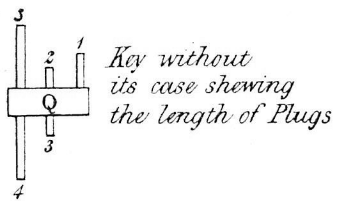


FIG. 11.

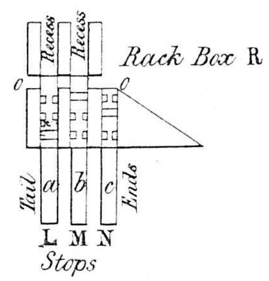


FIG. 12.

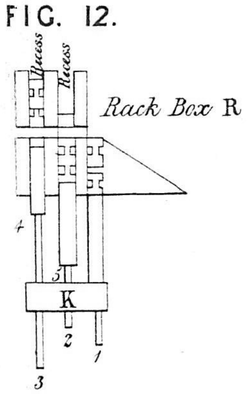


FIG. 13.

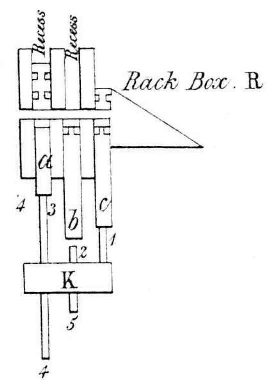


FIG. 16.

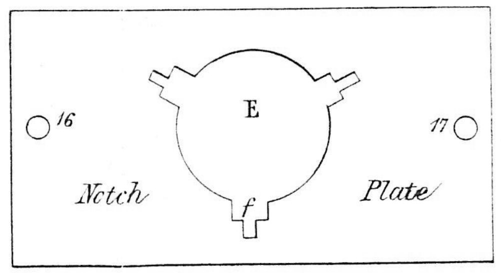


FIG. 20.

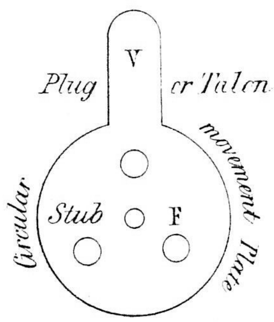


FIG. 17.

Cylindrical Rack Box removed out of the Lock

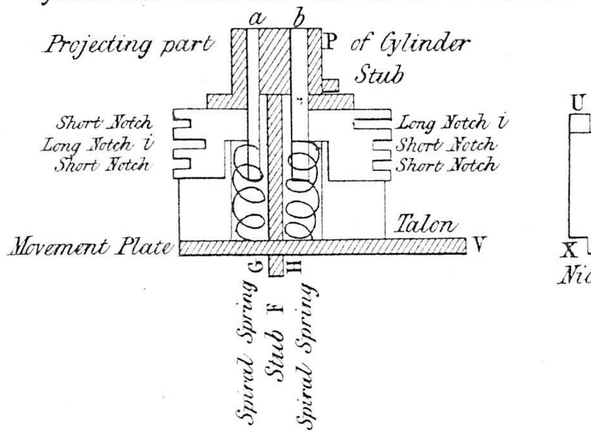


FIG. 18.

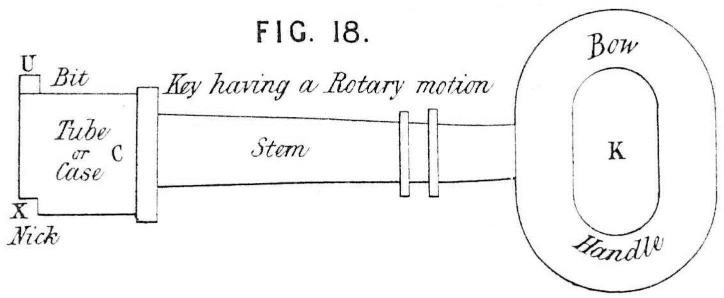
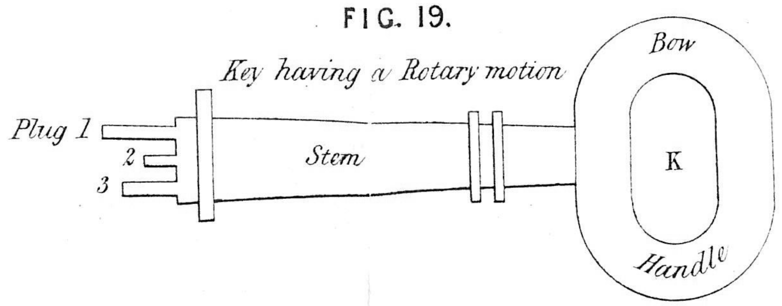


FIG. 19.



colored.

LONDON: Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1856.

FIG. 14.
Outside or Front plate of Door Lock

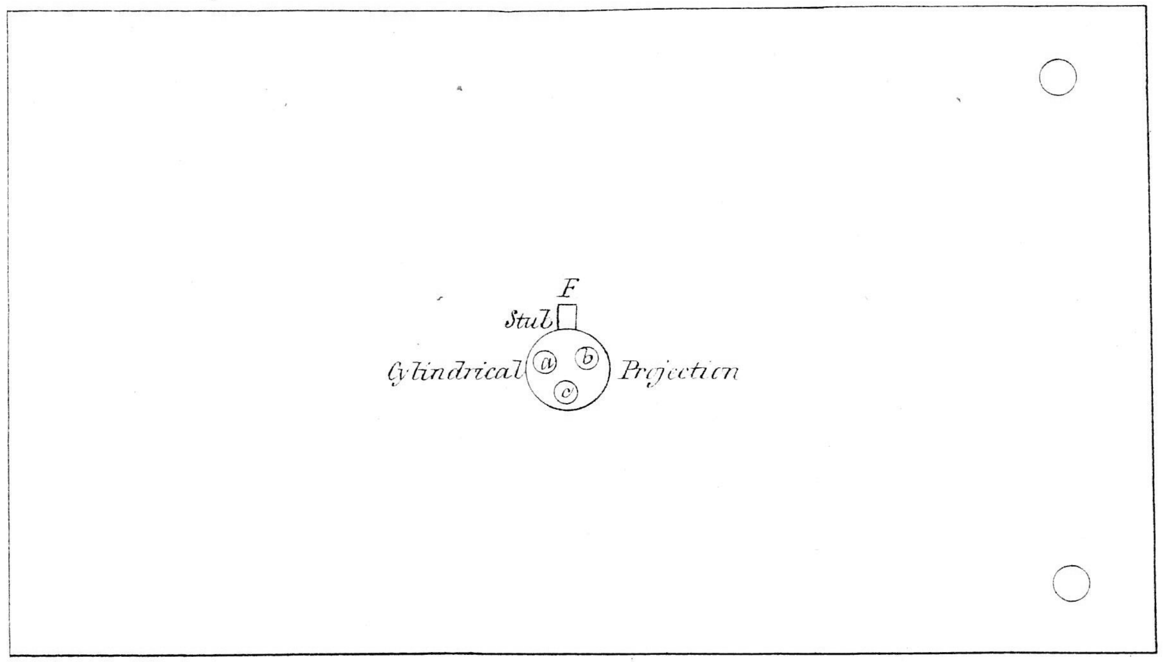


FIG. 15.
Inside of Door Lock with Back Plate removed.

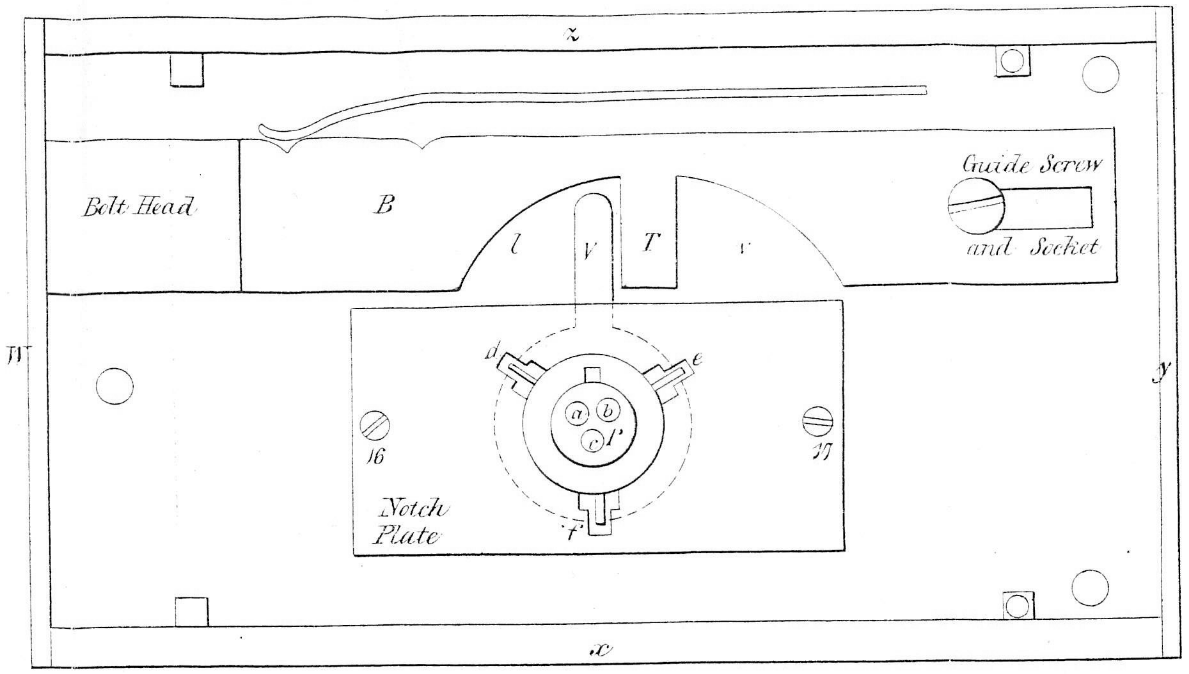


FIG. 25.

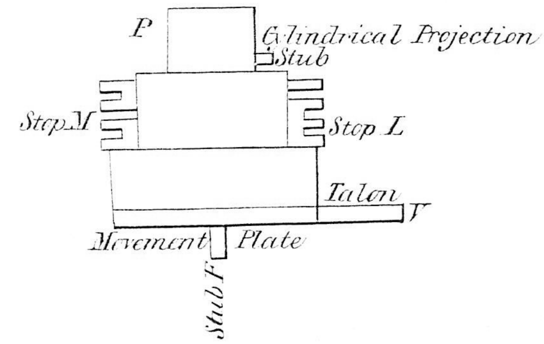
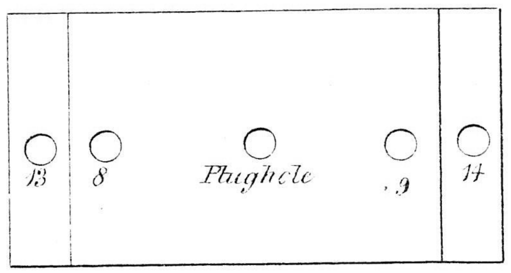


FIG. 21.



Inverted Staple

FIG 21*

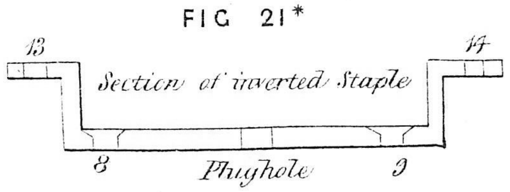


FIG. 24.

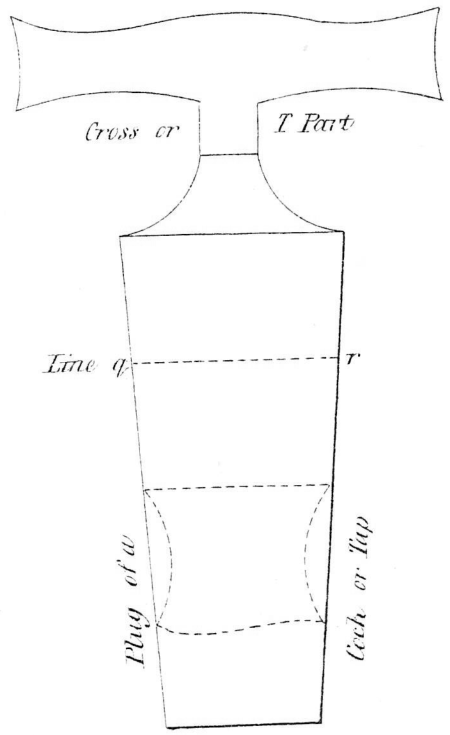


FIG. 27.

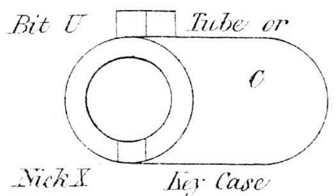


FIG. 26.

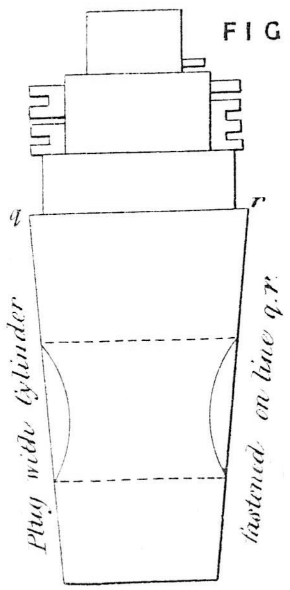
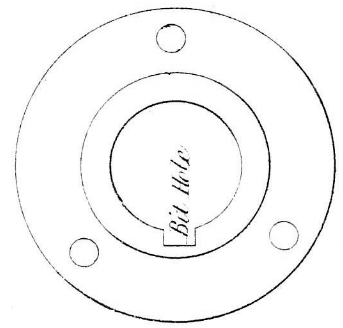


FIG. 28.



Scutcheon I.

Drawn on Stone by Malby & S

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