A.D. 1818 . . . . . N° 4219.

Locks.

CHUBB'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JEREMIAH CHUBB, of Portsea, in the County of Southampton, Mechanic, send greeting.

WHEREAS His most Excellent Majesty King George the Fourth did, by His Letters Patent under the Great Seal of the United Kingdom of Great Britain and Ireland, bearing date at Westminster, the Third day of February, in the Fifty-eighth year of His reign, give and grant unto me, the said Jeremiah Chubb, my exors, admors, and assigns, His special licence, full power, sole privilege and authority, that I, the said Jeremiah Chubb, my exors, admors, and assigns, should and lawfully might, during the term of years therein mentioned, make, use, exercise, and vend, within England, Wales, and the Town of Berwick-upon-Tweed, my Invention of "CERTAIN IMPROVEMENTS IN THE CONSTRUCTION OF LOCKS;" in which said Letters Patent there is contained a proviso that if I, the said Jeremiah Chubb, shall not 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, and cause the same to be inrolled in His Majesty's High Court of Chancery within six calendar months next and immediately after the date of the said Letters Patent, that then the said Letters Patent, and all liberties and advantages whatsoever thereby granted, shall utterly cease, determine, and become void, as in and by the same (relation being thereunto had) may more fully and at large apper.

NOW KNOW YE, that in compliance with the said proviso, I, the said Jeremiah Chubb, do hereby declare that the nature of my said Invention, and the manner in which the same is to be performed, are particularly

described and ascertained in and by the Drawings hereunto annexed, and the following description thereof (that is to say):—

My improvements in the construction of locks are applicable to all such locks as contain tumblers, sliders, or detents, for the purpose of detaining the bolt of the lock and preventing all motion or withdrawing of it, unless such tumblers, sliders, or detents are first disengaged from the bolt. They also render these locks more secure, and likewise give notice to the owner if any attempt has been made with a false key or otherwise to violate the lock.

As there are many varieties of tumblers or slider locks in common use, I shall first state the general properties of a tumbler lock, and how it acts, in order that my improvements may be the more clearly understood. Each tumbler in any such lock is a bar, plate, or piece of metal which is retained in its place in the lock by a fixed center pin passing through it, and the tumbler is moevable about this centre pin in the manner of a lever. The tumbler is applied in the lock in such a position that some part of it is opposed to a stud or teeth, which projects from the bolt of the lock, and will prevent the said bolt from being withdrawn (the centre pin of the tumbler being situated in the direction of the motion), until the tooth of the bolt is admitted into an opening in the tumbler, which permits such stud or tooth of the bolt to pass. For this purpose a notch is cut in the tumbler, of sufficient dimensions to admit the tooth or stud of the bolt to pass into it; therefore, if the tumbler is moved on its centre pin into such a position that its notch is just opposite to the stud, the bolt may then be moved or withdrawn, but not otherwise. Two, three, or more such tumblers may be applied to a lock, one tumber over the other, upon the same center pin or otherwise, and all acting against the same stud of the bolt; each tumbler, however, being provided with a separate spring, operating to press it towards the center of motion on which the key of the lock turns round. These springs occasion the tumblers always to place themselves with the solid part of each tumbler opposite to the stud of the bolt, and thus prevent the motion thereof; but when the key is applied to the lock, and turned round on its center of motion, different stops in the bit of the key act upon the several tumblers, and raise or remove them, each one to that position in which its notch is brought opposite to the stud of the bolt, and in this state the key, coming to act upon the bolt, may shoot or throw the same, because the stud or tooth of the bolt is at liberty to pass into the notches of the tumblers, which are only just large enough to admit of the motion of the stud of the bolt. And it will be equally prevented if any one or more of the tumblers is removed too far or not far enough by the key; in short, to withdraw the bolt, it is necessary that each

tumbler be moved into some given position, and neither more or less; and as all the tumblers are independent one of another, it is excessively difficult to place each one in its true position by any other means than the application of the true key.

Locks answering to the aforesaid description may be constructed in various ways, as to the arrangement and combination of their parts, but will be found to possess the same properties. Thus the tumblers may be made to turn on their extreme ends or their centers, or the studs or pins may be placed upon the tumblers, and made to work into notches in the bolt, instead of being made in the tumblers themselves, or sometimes a single tumbler is placed above the bolt in common locks, and the bolt is disengaged, even though the tumblers may be raised too high. But my improvements equally apply to all these constructions of locks, as well as to those with sliders acting parallel or vertically to the plate of the lock. I wish it nevertheless to be understood that I do not make claim to the Invention of any such lock as aforesaid, or to any particular combination of its parts, but my Invention consists in the following improvements thereupon:—

First, in what I call detecting mechanism, of which the parts are as follows:—The detector is a detent or lever moving upon a fixed center pin, and formed with a hook or catch adapted to interlock with a notch or stud in the bolt of the lock, so as effectually to stop and resist the motion of such bolt whenever the detector is moved on its center pin so as to come into contact with the bolt; but if the detector is moved on its center pin so as to be clear of the bolt it will then make no opposition to its motion. The detector spring is a spring applied to the detector in such a manner as to urge its hook or catch towards the bolt when the detector is moved, or as to bring the said hook or catch nearer to the bolt than a certain position, which may be called the point of detection. The said detector spring will urge the detector hook away from the bolt whenever the same is at a greater distance from the bolt than the said point of detection. The detector is so placed as to be operated upon by the tumblers of the lock when the whole, or any of them are raised; and if any one of the tumblers is raised too high, (that is to say) is moved farther from the center of motion of the key than the required position, in which the notch in such tumbler comes opposite to the stud of the bolt, as before described, then such tumbler, which has been too much raised, will move the detector beyond or within the point of detection, in which case the detector spring will throw the hook of the detector into contact with the bolt, and the detector will effectually stop any motion of the bolt, even though the tumbler which occasioned the detection should be restored to its proper

position; for though any one of the tumblers which may be raised too high will operate against the detector to throw its hook into the bolt, yet there is no connection between such tumbler and the detector which can occasion the detector to leave its then position, as the true key of the lock will raise each tumbler to its required position, and no farther; it will never throw the detector beyond or within the point of detection, consequently the detector spring will always keep the detector hook disengaged from the bolt; but if a false key or picklock be employed to raise the tumblers there will be every probability that some one will be raised too high, and will move the detector beyond the point of detection, so that the detector spring will then throw the hook into contact with the bolt. In this state the lock is what I call detected, and the possessor of the true key has evidence that an attempt has been made to violate the lock, because the said true key will not now open it, for neither the true key or tumblers have any means of communication with the detector after it has passed within the point of detection.

The remaining parts of my detecting mechanism are for the purpose of regulating the lock, or releasing its bolt from the detector; they are as follows:—The regulating bolt is a bolt or slider within the lock, adapted to operate upon the detector in such manner as to raise or remove the hook thereof away from the bolt of the lock beyond the point of detection, and it is operated upon by an adjusting instrument which I call the regulating key, which may be similar in form to other keys, but will not open the lock, it being designed only to discharge the detector, and restore the lock to such a state of adjustment that its own key will open it. For this purpose it has a different arrangement of the steps on its bit, one of which shifts or moves the regulating bolt. The regulating bolt may be placed over or under the bolt of the lock and has a pin or stud which projects from it, and applies against the same or other tumblers, which are adapted to resist the motion of this regulating bolt, unless each one of the said tumblers are raised or moved into a given position, and neither more or less, by means of the several steps in the bits of the regulating key. The regulating key, being applied in its place in the lock, and turned partly round, its several steps will first raise each tumbler to its exact required position, and then it will move the regulating bolt, by which means the detector will be moved without or beyond the point of detection, and the detector spring will throw the hook of the detector out of the reach of the bolt, which may be effected by a small inclined plan or wedge upon the regulating bolt, as will be seen in the following Drawings. By this means the lock will be regulated, or restored to its original state, and can be opened by its true key.

My detecting apparatus or mechanism may be constructed in various forms, and the parts may be made of such metal as is generally used in the construction of locks, and combined in several different ways according to the discretion of the workman, who must consider the size and description of lock to which it is to be applied, and must keep in mind the distinctive properties of the Invention as I have specified them. Instead of one single detector being applied to the bolt of the lock, several independent detectors may be applied, one to each tumbler, to detect or catch the same if it should be raised too high. The regulating bolt may be made to slide in the manner of the bolt of the lock, or it may be made to move about a center of motion, and it may be placed beneath the bolt of the lock, and the regulating key may be applied to the same keyhole and the same center of motion as the true key, or to a separate center and keyhole; also the same tumblers may be made to serve for the regulating bolt as for the bolt of the lock, by having notches cut in different parts of them; and the same key may be made to serve for the true key and for the regulating key by changing its position in the lock.

But to render this Specification more clear, I have annexed Drawings to explain some of the modes of combining and arranging the parts of my detecting mechanism. This, in Figs. 1 to 8 inclusive: 1 is the center pin on which the detector moves; 2, the tail or end of the detector proceeding very nearly down to the tumblers B; 3, the hook which detains or holds the bolt by falling into the notches 4, cut in the bolt in Figs. 1, 2, 3, 4, and 5, by meeting the projection 6 on the bolt in Figs. 6, 7, and 8. This locking of the detector into the bolt I call detecting the lock. 5 is the detector spring formed into a triangular piece, or nearly so, at the end, which acts against the detector, which also is made in a triangular form, or nearly so, at the end nearest 3, upon which the spring 5 acts. 7 is the detector or regulating bolt drawn separately at 7, Fig. 5, and seen in its proper place (the locking bolt and tumblers being removed) at Fig. 4. This detecting bolt slides upon the center pin of the tumbler D, and is further guided by a stud 8, Fig. 4, rising from the bottom plate of the lock, or may be guided in any other convenient manner. The regulating bolt 7 is only acted upon by the regulating key, since it is not required to move in the proper movement of the lock, its use being to raise the end 3 of the detector out of the notch 4 of the bolt by the action of an inclined place formed on its edge as at 9. 10 is the stud upon this regulating bolt, which rises up through the large openings in the tumblers, but cannot enter into the small notches 11 unless all the tumblers are raised to the right height for this purpose by the steps of the regulating key, which then shifts this bolt and discharges the

detector, but cannot act on the bolt of the lock, nor can this key turn quite round, but requires to be turned back again and removed so soon as it has performed its office of discharging the detector and adjusting the lock into a proper situation to be acted upon by the proper key.

The parts 6, 7, and 9 are also shewn in Fig. 9. E shews the form of the key proper for opening and shutting this lock in its ordinary state, as shewn at Fig. 1, but if a false key or other instrument should be introduced into this lock for the purpose of opening, shutting, or picking it, by which any one or more of the tumblers B are raised, they will also raise 2 and depress 3, until the inclined plane of the detector falls under the inclined plane of the spring 5, which point I call the point of detection, when the hook 3 will be instantly shot into one of the notches 4, and will thus retain the bolt either in its open or shut position, as shewn at Fig. 2, where the lock is drawn as detected with its bolt thrown, and now no further application (even of its proper opening key E) will have any effect in moving the bolt, nor can it be moved until the regulating key 12 has been introduced to restore its adjustment as before mentioned. In Fig. 5, A is the bolt of the above lock drawn separately; *a*, *a* is a side or edge view of the same; *b* the projecting pin which works in the large openings of the tumblers; *c*, *c*, an edge view of the regulating bolt, and 10 its projecting pin, which pin passes thro' a grove *e*, *e*, in the bolt, and is also imbedded or cased in the stud *b* of the bolt whenever that is in an unlocked position.

Figs. 6 and 7 show a different modification of the parts of my improvements. Figs. 6 shewing a desk lock, in which the proper key is introduced, and so far turned that the tumblers are raised to the proper height to permit two studs, *b*, *b*, used in this lock instead of one (as in the last-described lock) to slide over them; the same Figures are used to denote the detector and spring; and 6 is a projection on the bolt A, which is caught by the stud 3, and thus detected as shewn in Fig. 7; the inclined plane of the regulating bolt is in this lock made to act in a small stirrip 2, so that it pulls down the detector to clear it from the stud 6, instead of raising it as in the former case, and the regulating bolt of course moves in a contrary direction. E is the proper key of this lock, and 12 its regulating key. In all cases the proper opening key acts upon the several tumblers and bolt of the lock only, without at all affecting the regulating bolt, while the regulating key 12 acts upon the several tumblers and regulating bolt, and moves it sufficiently to discharge the detector, but does not touch or affect the locking bolt, or even put the tumblers into such a position as to permit it to move.

Another of my said improvements is shewn in Fig. 8, where, instead of

simply raizing the detector, as before described, I apply certain levers or detents in the nature of tumblers, and acted upon by seperate springs which retain the tumblers of the bolt in an improper position, or one in which it is impossible for the stud of the bolt to pass them if such tumblers should by any means be raised beyond that point of detection, or that point to which their own proper key should raise them. 13 shews one of these detents or detectors drawn seperately at Fig. 9; it is filed away to a step near its upper end, and the point or beak 14 of the tumbler B rests against it, rather below this step, but will move up and down in the ordinary working of the lock without catching upon such step, but if any of the tumblers should by any means be raised higher than is necessary for the passage of the bolt, such tumbler or tumblers will immediately be caught and retained upon the step of its corresponding detent which will so derange the openings in the tumblers as to prevent the motion of the bolt. These detents 13 can only be removed after they have detected or caught the tumblers by the regulating bolt 7, moved by a regulating key as before; the stud 10 passes into a notch 11 in the tumblers, to prevent this bolt being shifted except by its proper regulating key, and the pin 9, forcing against the upper ends of the detents 13, answers the purpose of the inclined planes 9 before described, and forces the detents so far back that the tumblers become unlocked and descend again to their proper working position. In this last construction of lock it is necessary to observe that every tumbler must not have a corresponding detent, because if this were the case the action of the regulating key would be such that in throwing back the detents 13 by the motion of the regulating bolt they would return again and engage with the tumblers as such key was moved backwards, and thus leave the lock without alteration or adjustment; to obviate this, therefore, I merely place the detents 13 to about half the tumblers, and in such as have them I make the cut or notch which the pin 10 enters of a greater width than the pin 10, so that as soon as the detent 13 is withdrawn and disengaged from its tumbler that tumbler can descend so low as to pass the step of 13, and thus it falls into a proper state of adjustment. The remaining number of tumblers which have not detents applied to them have their notches just fitting the pin 10, and of course only serve to increase the combinations or multiply the difficulty of shifting the regulating bolt 7 by means of the introduction of an improper key or other instrument, which difficulty is increased by the impossibility of knowing which of the tumblers have detents applied to them, and which have not. In this lock the detector may be introduced as in the Drawing or not, since the detents answer a similar purpose, and render the locks secure; but the use of the detector adds still more to that security, and is acted upon as before, by the inclined plan 9 upon the regulating bolt 7.

Chubb's Improvements in the Construction of Locks.

It would be endless to attempt to describe all the various forms and modifications which my aforesaid improvements will admit of in locks for various purposes; but what I have described will put the public in possession of the essential principles of my Invention or improvements, which it will be seen are to detain the locking bolt or tumbler or tumblers in such manner that, if an attempt should be made to pick or open the lock with a false key or other instrument, its own or true key shall be incapable of moving or opening it till it has been adjusted or regulated by the regulating key, which, being incapable of opening the lock, will never be used but in cases of improper attempts, and therefore may be kept with the utmost secrecy and privacy. But, to prevent the possibility of the regulating key being lost or mislaid, I propose in some cases making one key answer the purpose of both the opening and regulating key, by the adoption of the following arrangement:—The lock externally presents one keyhole in the direction seen at 19, Fig. 12; by this the key is introduced; and near the bottom plate of the lock is a second or intermediate plate, parallel to the first and bottom plate, and supported by a curtain or otherwise, as at 20, in Fig. 14. This plate is seen in plan at 21 in Fig. 13, where it will also appear there are two openings, one corresponding in form and possition to 19, and the other 22, Fig. 13, nearly at right angles to it. The key 23, Fig. 15, when used for the ordinary purpose of opening and shutting the lock, is passed thro' the holes 19 and the plate 21, in a straight direction to the very bottom of the lock, when the lowest step of the bit will act upon the locking bolt A, while the detecting bolt 7, lying immediately above it in this construction or modification, will not be touched by any part of the key; but should the lock at any time be attempted and become detected, so that the key will not open or shut it in this position, the same key may be turned until its bit comes beneath the opening 22, in the intermediate plate 21, and it must now be raised upwards through this opening until the lowest step of the bit is brought above the upper surface of the plate 21, when the long step, which before acted upon the locking bolt A, will now act upon the regulating bolt 7, as seen in Figure 14; so soon as it has regulated the lock it must be pushed down again, as in Figure 15, and now will act upon the locking bolt A.

In witness whereof, I, the said Jeremiah Chubb, have hereunto set my hand and seal, this Third day of August, in the year of our Lord One thousand eight hundred and eighteen.

JEREMIAH CHUBB. (L.S.)

modifica-
purposes;
tial prin-
:o detain
attempt
strument,
has been
opening
d there-
vent the
me cases
gulating
sternally
key is
mediate
irtain or
Fig. 13,
in form
s to it.
ing and
straight
bit will
ediately
part of
letected,
may be
late 21,
est step
he long
e regu-
lock it
pon the

nto set
of our

(L.S.)

Chubb's Improvements in the Construction of Locks.

AND BE IT REMEMBERED, that on the Third day of August, in the year of our Lord 1818, the aforesaid Jeremiah Chubb came before our said Lord the King in His 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.

Inrolled the Third day of August, in the year of our Lord One thousand eight hundred and eighteen.

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

A.D. 1818. FEB 3. N° 4219.
CHUBB'S SPECIFICATION.

FIG 1

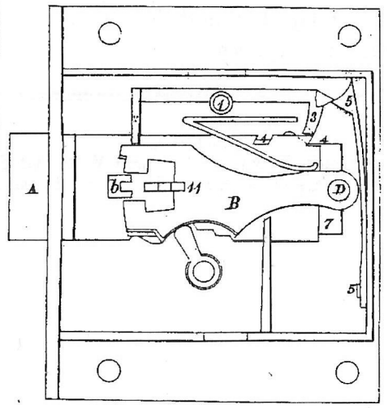


FIG. 2

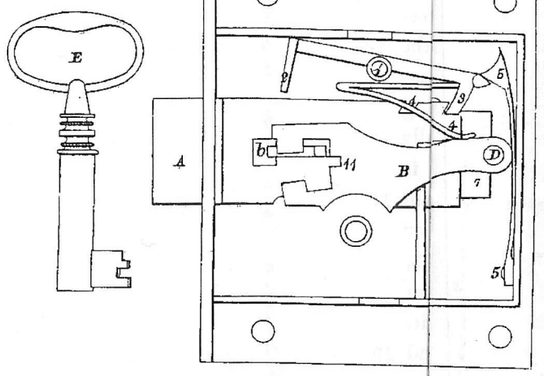


FIG. 3.

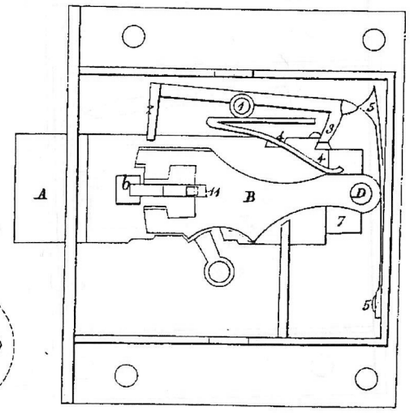
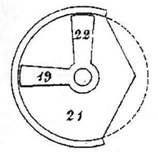


FIG. 12.

FIG. 13



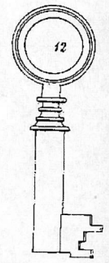
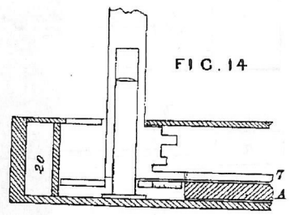


FIG. 14



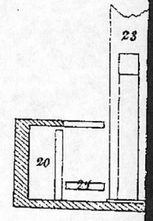
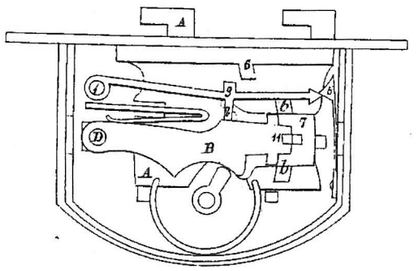


FIG. 6.



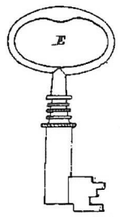


FIG. 7.

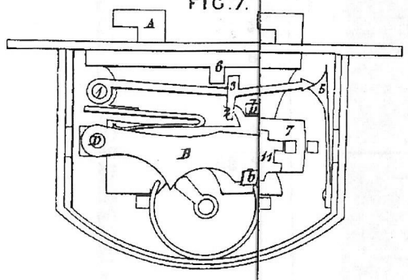
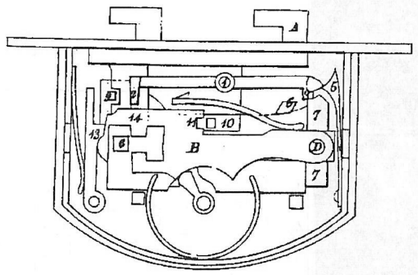


FIG. 8.



The enrolled drawing is colored.

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

(1 SHEET)

FIG. 4

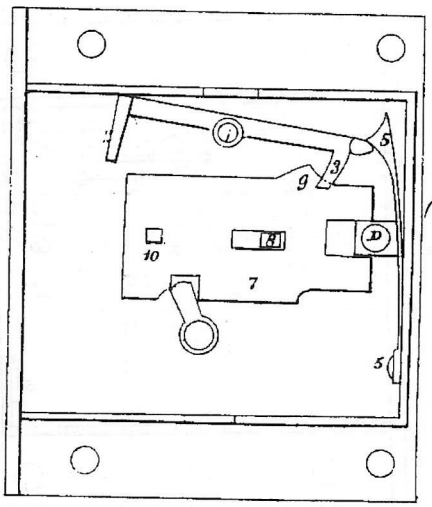
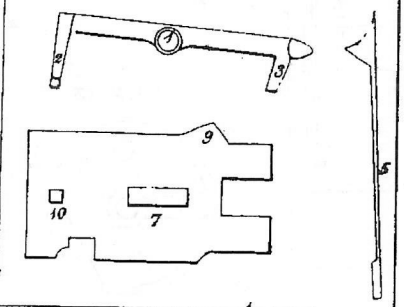


FIG. 5.



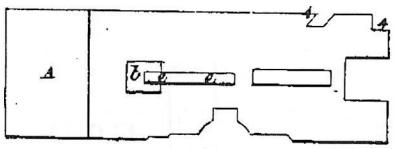
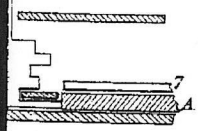
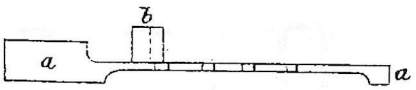


FIG. 15.





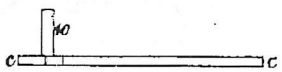
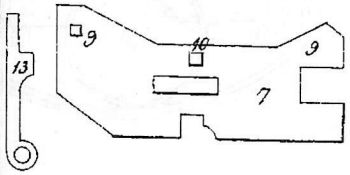
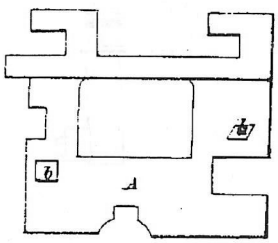


FIG. 9.





Drawn on Stone by Malby & Sons.