



A.D. 1846 N° 11,491.

Locks and Latches.

CHUBB'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JOHN CHUBB, of Saint Paul's Church Yard, in the City of London, Patent Lock and Fireproof Safe Manufacturer, send greeting.

WHEREAS I did, by Petition, humbly represent unto Her most Excellent Majesty Queen Victoria that I had invented "CERTAIN IMPROVEMENTS IN LOCKS AND LATCHES TO BE USED FOR FASTENINGS;" and Her said Majesty, being willing to give encouragement in all arts and inventions that may be for the public good, was graciously pleased, by Her Royal Letters Patent under the Great Seal of the United Kingdom of Great Britain and Ireland, bearing date at Westminster, the Fourteenth day of December (One thousand eight hundred and forty-six), in the tenth year of Her reign, for Herself, Her heirs and successors, to give and grant unto me, the said John Chubb, my executors, administrators, and assigns, Her especial licence, full power, sole privilege and authority, that I or they, by myself or themselves, or by my or their deputies, servants, or agents, or such others as I or they shall agree with, and no others, during the term of fourteen years from the date of the said Letters Patent, should and lawfully might make, use, exercise, and vend my said Invention, within that part of Her said Majesty's Dominions called England, Her Dominion of Wales, and Town of Berwick-upon-Tweed, and the Islands of Jersey, Guernsey, Alderney, Sark, and Mán, and also in all Her Majesty's Colonies

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and Plantations abroad, in such manner as to me, my executors, administrators, and assigns, shall seem meet, and as that I or they shall enjoy the whole profit and advantage arising by reason of the said Invention during the said term of fourteen years; and whereas the said Letters Patent contain a proviso, obliging me, the said John Chubb, particularly to describe and ascertain the nature of 5 my said Invention, and in what manner the same is to be performed, by an instrument in writing under my hand and seal, and to cause the same to be enrolled in Her 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 10 large appear.

NOW KNOW YE, that in compliance with the said proviso, I, the said John Chubb, do hereby declare that my said Invention is described and ascertained in manner following, and by the aid of the two Sheets of Drawings hereunto annexed (that is to say) :—

The object of my said improvements in locks and latches to be used as fastenings is, to obtain the utmost possible security against the opening of locks or latches which are constructed according to my said improvements, either by means of any kind of picklocks or of false keys; and that object I attain by application in the manner herein-after described of a greater number 20 of the parts called tumblers than have been heretofore applied in locks, or than could be applied with advantage according to the ordinary mode of applying tumblers to the sliding bolt or bolts of the lock. According to my improvements the whole number of the tumblers which are to operate together in the same lock or latch are arranged in two, three, or four distinct sets 25 arranged round the centre pin or centre of motion of the key, so as that the whole number of the said tumblers will be lifted simultaneously by action of one key, which has as many different bits as the number of distinct sets aforesaid, in which the whole number of tumblers are arranged, those different bits projecting out from the central part of the key on different sides of that central 30 part suitably for the different positions in which the aforesaid distinct sets of tumblers are arranged around the centre of motion of the key, in order that each one of the said bits of the key may act upon the several tumblers of one of the said sets of tumblers, so as to move or lift each of those tumblers to its proper intended position (with the usual action of the lifting of the several 35 tumblers of one set by the one bit of the key in ordinary tumbler locks), but all the two, three, or four bits that the key may have will act simultaneously on so lifting the tumblers of the two, three, or four distinct sets in which the whole

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number of tumblers may be arranged, wherefore all the tumblers constituting
 that whole number of tumblers will be lifted to their respective intended
 positions at one and the same moment by one action of turning the key; for
 although the different bits of the key act distinctly one from the other (each
 5 bit acting to lift the several tumbler of that set to which the said bits applies)
 the distinct actions of the several bits are simultaneous. And further, the stud
 or stump pin which acts in the notches of the tumblers of each set of tumblers
 is not fastened into the bolt of the lock, as usual in ordinary tumbler locks, but
 instead thereof the two, three, or four stump pins belonging to the two, three,
 10 or four sets of tumblers are all fastened into a flat circular plate, which is
 moveable round the centre pin or centre of motion for the key; the several
 stumps being arranged at such places in the said circular plate as to correspond
 to the several sets of tumblers wherewith each stump is to act respectively,
 and the motion of the said stumps (after all the tumblers have been lifted by
 15 action of the key, so as to permit the stumps to move), will take place in
 circular arches about the said centre of motion, because all the stumps being
 fastened into the said circular plate, they will all be carried round together by
 motion thereof around its said centre of motion. And the sliding bolt of the
 lock is connected with the said circular plate by a pin projecting from the
 20 plate and entering into a transverse notch in the bolt (or vice versa) so that
 the endway motion or shooting of the bolt will of necessity be accompanied
 with a small extent of turning motion of the circular plate about the said
 centre of motion. But all such endway motion of the sliding bolt and turning
 motion of the circular plate is effectually prevented by the aforesaid stumps
 25 being interlocked in the notches of the tumblers, except when every one of
 those tumblers has been lifted by action of the bits of the key into the proper
 intended position for each of the tumblers respectively, so as to bring all the
 notches of the tumblers of each set into correspondance one notch with
 another, and with the stump belonging to that set, which being done with
 30 all the tumblers simultaneously, then none of the tumblers will offer any
 impediment to the motion of the stumps, but they and the circular plate
 in which they are fastened, and also the sliding bolt, will be at liberty to
 be moved by the usual action of one of the bits of the key against what
 is called the talon of the bolt, or, in the case of a latch, such motion may be
 35 communicated to the bolt by reaction of a suitable spring for shooting the
 bolt, although the motion for withdrawing or unlocking the same bolt must be
 given by the aforesaid action of one of the bits of the key against the said talon
 of the bolt. And for the more complete explanation of the manner of applying

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and using my said improvements advantageously, in concert with other ordinary and well-known parts of locks, I have in the annexed Drawings given full size representations of a very complete and most secure lock, constructed according to my said improvements, with four sets of tumblers and four bits on the key, also four stumps in the circular plate aforesaid, to act in the 5 notches of the four sets of tumblers, the whole number of which tumblers is nineteen in the four sets. And further, each set of tumblers is provided with a detector, constructed and applied to those tumblers according to improvements formerly invented by my late father Charles Chubb, and for which Letters Patent were granted to him and to Ebenezer Hunter, the said 10 detectors having the effect of coming into action of themselves for preventing the lock from being unlocked (even by its own key) in case of any one of the tumblers of either of the four sets having been lifted too high in attempts to unlock the lock by introduction of picklocks or false key. The lock in such case becomes more difficult to unlock in consequence of the action of the detector, 15 and the lock also shews that such attempts have been made by the circumstance that it cannot be afterwards unlocked by its own proper key until a suitable manipulation has first been made with that key for undetecting the lock, and putting the detector or detectors out of action. And further, the said lock is provided with an escutcheon lock, the sliding bolt of which, when 20 locked, shoots its end across the aperture of the keyhole of the principal lock so as to shut up the hole, in order to prevent the introduction of any picklock or false key, or the true key at the keyhole, unless the said sliding bolt of the escutcheon lock is first withdrawn, which would be exceedingly difficult to do without the true key of that escutcheon lock, for the said sliding bolt thereof 25 has a complete set of tumblers with a detector thereto, in the manner of the safest locks heretofore made. Also the said bolt is made of steel so hardened and tempered at the part which shuts up the keyhole that it cannot be cut or drilled. The said lock is represented as being applied to secure and fasten a combination of four door bolts which actually fasten the door to which the lock 30 is applied by shooting out in four directions, so as to bolt the door at its top and its bottom, and at each of its sides. Those four bolts are not moved by the lock or its four-bitted key, but are moved by a handle at the outside of the door, together with a circular turning wheel inside the door, connected with the handle, and having four spiral grooves in that wheel which act to shoot all 35 the four bolts at once, when the handle and wheel are turned so as to fasten the door by the said four bolts, and then the sliding bolt of the lock being shot by its key with four bitted locks into a notch in the said turning wheel, and

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thereby acts to prevent the said four bolts from being withdrawn by means of the said turning handle, even although the same should remain accessible at the outside of the door, because the turning wheel at the inside of the door is fastened by the bolt of the lock, and prevented from being turned. And in
 5 case of a latch instead of a lock being constructed according to my said improvements, then all the aforesaid parts, and the said sliding bolt hereinbefore mentioned as the sliding bolt of the lock, may be nearly the same, except as to being a spring or latch bolt, that is, having a spring applied to it, and exerting a constant tendency to urge the bolt forwards endways, so as to
 10 latch of itself by entering into the said notch in the aforesaid turning wheel, so soon as the said notch is brought (by the turning round of the said wheel) opposite to the end of the said spring sliding bolt of the latch. Wherefore the latch will fasten of itself after the door is shut and has been bolted by its four fastening bolts, without any application of the four-bitted key for so
 15 fastening; but the application of that key is necessary for withdrawing the spring sliding bolt with the same action, as already explained, out of the said notch in the turning wheel, in order to have the same at liberty to be turned round by means of its handle for unbolting all the four fastening bolts of the door. The spring bolt when so withdrawn from the said notch will
 20 remain on the latch ready to latch again by reaction of its spring as before, whenever the four door bolts are bolted again.

Fig. 1, Sheet I., represents the lock in elevation as it stands behind the door, with its cover plate removed to shew the interior parts, which are all in their places complete. Fig. 2 is a vertical cross section through the centre of
 25 motion of the key. Fig. 3 is a horizontal section through the said centre of motion. Fig. 4 is another vertical cross section through the centre of motion of the circular turning wheel for shooting the four door bolts all at once. Fig. 5 is another horizontal section through the centre of motion of the key for the escutcheon lock as the section would appear when viewed from below
 30 upwards.

Fig. 6, Sheet II., is an elevation corresponding to Fig. 1, except that the parts nearest to the spectator in Fig. 1 are removed in Fig. 6 in order to exhibit other parts which are more remote and are concealed in Fig. 1. The remaining Figures in Sheet II. are detached parts shewn separately. The
 35 same letters of reference denote the same parts in all the Figures. A is the rim or exterior case of the lock, consisting of a bottom or back plate C and four sides A, as usual in other locks. B, Figs. 2, 3, 4, 5, is the cover plate (in section) which fits to the said four sides A, and is fastened thereto in

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place with screws so as to form a complete box or case which encloses all the mechanism of the lock. The said cover plate B applies against the inside of the door when the lock is fastened by screws in its place against that inside. The keyhole is cut out through the cover plate B suitably for the admission of the key with four bits, the keyhole being in the form of a cross, thus × ; and 5 a corresponding keyhole is cut through the door. Note, the cover plate B is fortified by a plate of steel, hardened and tempered, fastened to the outside of the cover plate, as shewn at *b, b*, Figs. 2, 3, 5, in order to prevent any cutting or drilling into the lock, even if the door itself should have been cut or drilled through. The said steel plate *b, b*, applies against the inside of the 10 door when the lock is in place, and the keyhole is formed in that steel plate which prevents enlargement of the keyhole. *a* is the fixed centre pin, on which the tube or pipe of the key fits, and which pin serves as its centre of motion. D, E, F, G, are the four sets of tumblers, which are arranged at equal distances apart around the central pin *a*, and at equal distances from that 15 pin. *h, h, h, h*, are the four fixed centre pins, about which the tumblers of each set are moveable, and *l, l, l, l*, are the sets of springs by which the several tumblers of each set are continually urged to move about their respective centre pins *h* in a direction towards the centre pin *a*. There are five tumblers in each set, all mounted on the same centre pin *h*, the five being one behind another ; 20 wherefore they conceal one another in Fig. 1, but are distinguishable in the sections Figs. 2 and 3. Each of the sets of springs *l* is formed of one piece of steel cut with nicks like the teeth of a comb, so as to become divided into five springs which act independantly one of another, but one spring acts behind each tumbler of the set of tumblers to which the set of springs belongs. See 25 Fig. *b*, Sheet II., which represents one of the sets of springs detached. H is the flat circular plate which is fitted on the centre pin *a*, so as to be moveable thereon for its centre of motion. The plate H is situated behind all the four sets of tumblers D, E, F, G, and the stumps *m, n, o, p*, which are firmly fastened into the plate H, project out from it at right angles to its plane, so as to pass 30 through the notches of all the tumblers of each set in order to be interlocked in those notches, as is shewn in Fig. 1, and in the sections Figs. 2 and 3, where the plate H, and its stumps *m, n, o, p*, are distinguished by being of the same color as the same parts in Fig. 1. The plate H appears more distinctly in Fig. 6, Sheet II., because the tumblers are all removed. Fig. H, Sheet II., 35 shews the plate H detached, and Figure D, E, F, G, the four sets of tumblers detached, but with their respective sets of springs *l* in their relative positions. I is the sliding bolt of the lock situated behind the circular plate H, between

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that and the back plate C of the lock, as appears in the sections Figures 2 and 3. See also Fig. 6 and Figure I. Sheet II., the latter shewing the bolt detached. The centre pin *a* projects out from the middle on a flat rectangular plate, which is fastened behind the back plate C of the lock by screws, the pin *a* passing through the plate C, and standing forwards as a firmly fixed centre pin in the space between the four sets of tumblers. The pin *a* also passes through a slot in the bolt I, and through the central hole of the circular plate H. The four centre pins *h, h, h, h*, for the tumblers are fixed into the back plate *c* of the lock, and stand forward therefrom. The pins *h, h*, for two sets of tumblers D and F, pass freely through slots in the bolt I, and by means of a stud pin and slot *x* in the tail end of the bolt, that end is guided in its endway motion, the other, or locking end of the bolt, being guided by passing through the piece J, which is firmly fastened to the back plate C of the lock; or, in case of a smaller sized lock, then J might be straight, and form part of the rim A or exterior case of the lock, with the locking end of the bolt I shooting out through the rim A in the usual manner of ordinary locks. *g*, Fig. 2, is a pin projecting out behind the circular plate H, and entering into a transverse slot *y*, Fig. I., Sheet II., in the bolt I, so as to cause the bolt I and the circular plate H to move together, and also to prevent either one moving without the other, but each will move with its own kind of motion, videlicet, the bolt I sliding endways through its proper extent of such motion for locking and unlocking, will require the plate H to turn round about its centre pin *a* with a small extent of circular motion; but the stumps *m, n, o, or p* will prevent the latter motion by their interlocking into the notches of the tumblers, unless all the tumblers in all the four sets D, E, F, G, are lifted or moved (by action of the several stops on the four bits of the key against the edges of the several tumblers respectively), so that all the notches in the tumblers of each set will come into exact correspondence one notch with another, and all the notches in exact correspondence with that stump *m, n, o, or p*, which acts in those notches, and after the whole number of tumblers in all the four sets have been so lifted exactly to the proper intended position for each tumbler, then the notches of the tumblers will allow the stumps *m, n, o, p*, to move freely with the circular motion due to the flat circular plate H, from which those stumps project out. But if any one or more tumblers out of the whole set is not lifted high enough (that is to say, not moved far enough away from the centre pin *a*), or if any one or more of the tumblers is over lifted (that is to say, moved too far away from the said centre pin *a*), that one or more tumblers will detain the stump in its notch or notches, so as to prevent motion thereof

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and of the plate H, and, consequently, of the bolt I for unlocking the same, all which is the common and well-known action of tumblers of the best locks, except as to the greater number of tumblers, and those tumblers being arranged according to my improvements in distinct sets D, E, F, G, and adapted to be operated upon all at one time by as many distinct bits of the key, and also as many distinct stumps, *m, n, o, p*, as there are distinct sets of tumblers; but all those stumps fastened into the same flat circular plate H, which is connected by its pin *q* with the bolt I, as aforesaid, so that the bolt I and the plate H, together with all the stumps *m, n, o, p*, must of necessity move simultaneously, and, consequently, if any one of those stumps is detained from moving by interlocking into the notch or notches of any one or more of the whole number of tumblers, the detention of that one stump will prevent all motion of the circular plate H and of the bolt I. Motion is given to the bolt from the key by means of a piece *r*, called the talon, which projects forward from the bolt I, as is seen in Fig. 2. See also Fig. 6, Sheet II., and Fig. I. The talon *r* passes through an opening *u*, Fig. H, Sheet II., in the circular plate H, so as to avoid all interference with the motion of that plate, and the talon *r* projects forwards through the plate H, into the place of the furthest tumbler *s*, Fig. 2, of the set D of tumblers, the acting edge of which furthest tumbler *s* is cut away to make room for the talon *r*, to reach to the proper position for being acted upon by the furthest step *v*, on that same bit *d* of the key, which bit acts by its other steps against the edges of the other four tumblers of that set D. The key K is shewn detached in Fig. K, Sheet II., its four bits being marked *d, e, f, g*, according as they are adapted to act against the four sets of tumblers D, E, F, G. The key K is also seen in section in Fig. 2, as it would appear when in its place in the lock, acting with its two bits *d* and *f* against the edges of the tumblers D and F, and also shewing how the furthest step *v* of the bit *d* of the key is to act within the notch in the talon *r*, in order to move the bolt I for shooting the same; likewise shewing how the tumbler *s* is cut away (as already mentioned) to make room for the talon *r*; and for the same reason, the tumbler which is adjacent to *s* is also cut away part of its thickness, but leaving enough thickness of edge to that tumbler for being acted upon by that narrow step of the bit *d* of the key, which narrow step is next to the furthest step *v* thereof. But the tumbler *s* having all its edge cut away where the key should act against it, that tumbler *s* is wholly useless as a tumbler, and is only introduced for keeping the other tumblers of the same set in due place, the notch of the useless tumbler *s* is cut out large enough for the stump *d* to move therein

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without ever interlocking, the said tumbler s being useless. There are in effect only nineteen tumblers in the whole number, as already mentioned, although there are four sets of tumblers, and (as already mentioned) five tumblers in each set.

5 The parts represented in the Drawings which have now been described with reference in detail to the Figures of those Drawings, and the arrangement and action of those same parts, as already herein-before described in words (as well as with the said references in detail to the Drawings), are all according to my improvements, and may be made to form a complete lock or latch
10 without being combined with the other parts represented in the Drawings, and already partly described in words, but herein-after to be more particularly described with references in detail to the Figures of the Drawings; that is to say, the rim A, A, and back plate C of the lock, may be made of much smaller dimensions than represented, so as to be according to the dotted
15 lines X, Y, Z, Fig. 1, and only to include those parts which have been already described, with references in detail to the Drawings. The sliding bolt I, with the locking end thereof, in such case passing through one end of the rim A, and shooting out therefrom when locked, as already mentioned, in the manner of ordinary locks. Such a lock would contain the four sets of
20 tumblers D, E, F, G, with their stumps *m, n, o, p*, and circular plate H thereof, with its pin *q*, and the key K, having its four bits *d, e, f, g*, to correspond to the said four sets of tumblers D, E, F, G, and such lock would be according to my improvements; or one or two of the sets of tumblers may be omitted, the corresponding bits of the key being also omitted, and the said
25 lock will be simpler, but still according to my improvements. And in case of such simpler form of the said lock being made by the omission (as aforesaid) of one or more of the sets of tumblers, the set D of tumblers, and the bit *d* of the key K, must be in all cases retained, because it is that bit *d* which acts on the talon *r* of the bolt. Also the circular plate H, with its pin *q*, is in all cases
30 to be retained, but with only as many of its stumps *m, n, o, p*, as belong to the sets of tumblers D, E, F, or G, which are retained in the lock. For the circular plate H, with its pin *q*, and so many of its said stumps as there are distinct sets of tumblers in the lock, and distinct bits on the key, is the means whereby the different sets of tumblers are, (according to my improve-
35 ments) enabled to act in concert for preventing all motion of unlocking, unless all the tumblers in all the sets thereof are first lifted or moved by the key to the proper intended position for each tumbler respectively. And by means of the said circular plate H, with its four stumps, the lock can be made with four sets of tumblers, as represented in the Drawings, and the omission of one set

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or of two sets of those tumblers, together with omission of the stump or stumps belonging thereto, and of the bit or bits of the key corresponding thereto, will make no difference in the action of the lock, except as to being more perfectly secure when there are more tumblers, and vice versâ; and in case there are only to be three sets of tumblers and three bits to the key 5 (D being one of those sets, and *d* being one of those bits), then the other two sets and bits may be either E, G, and *e, g*, or else E, F, and *e, f*, or else F, G, and *f, g*. Or otherwise the three sets of tumblers may be conveniently arranged at equal (or nearly equal) angular distances apart around the centre of motion *a*, the three stumps in the plate H, and the three bits of the key, 10 being correspondingly arranged. Note, the key will in the last-mentioned case require to be turned round one third of a revolution in the act of locking or unlocking the bolt, whereas, in all the preceding cases (and according to all the Figures) the key only requires to be turned one fourth of a revolution. 15 And in case there are to be only two sets of tumblers and two bits to the key (one set being D and one bit being *d*), then the other set and the other bit may be either E and *e*, or else G and *g*, in either of which cases the two bits (*d* and *e*, or *d* and *g*) of the key will stand out at right angles one to the other, about the central pipe or tube of the key, and the key will only require to be turned one fourth of a revolution for locking or unlocking; or otherwise, 20 the two sets of tumblers may be D and F, and the two bits of the key *d* and *f*, in which case those two bits will be opposite one to the other, and the two stumps *m* and *o* in the plate H will be at opposite sides of the centre *a* thereof, and the key will require to be turned half round for locking or unlocking. And note, whereas locks have been heretofore made with two bits 25 to the key, and one of those bits opposite to the other, each of those bits being adapted to act against a distinct set of tumblers, and a distinct bolt within the lock, I make no claim to such key with two bits, one opposite to the other, as part of my improvements, unless the lock to which that key is adapted contains a circular plate such as H, with its pin *g* acting in a notch 30 in the one bolt of the lock, and with the two stumps of that plate H acting with and interlocking into the notches of the two sets of tumblers. The said plate H, with its pin *g*, and its said stumps, being as already mentioned, the means whereby I am enabled to make four or three distinct sets of tumblers act in concert to prevent the unlocking of one bolt, the same means are equally 35 applicable for two sets of tumblers. And whereas locks have been heretofore proposed, called quadruple locks, with four sets of tumblers arranged at equal distances apart around the centre of motion for the key, somewhat similarly to D, E, F, G, but each of those sets of tumblers having a distinct sliding bolt

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belonging to it, with a stump fastened into that bolt for acting with and interlocking into the notches of the tumblers of that set, the key for such quadruple lock having only one bit (as usual in ordinary keys), and that one bit acting when the key was turned round, first to lift the tumblers of one set and to shoot the bolt belonging to that set, and then, after that, in turning further round, the same bit of the key acting to lift the tumblers of the next set, and to shoot the bolt belonging thereto, and then in like manner lifting the tumblers and shooting the bolt of the third set; and lastly the same of the fourth set of tumblers and bolt, so that the operation of the one bit of the key on the four sets of tumblers and bolts would be successive for shooting those four bolts one after the other as the key was turned round through a whole revolution; now I make no claim to the arrangement of four sets of tumblers, such as D, E, F, G, in the same lock, unless the key therefor has four bits corresponding to the four sets of tumblers, and adapted for acting simultaneously, so that the whole number of tumblers in all the four sets will be lifted at the same moment in the manner herein-before fully described, also the four stumps for all the four sets of tumblers, being all fastened into the same circular plate H, and that plate being connected by its pin *q* with the one bolt of the lock, the whole number of tumblers in all the four sets are thereby enabled to act in concert for securing that one bolt from being unlocked, so that if any one tumbler of any of the sets is not fully lifted, or is over lifted, that one tumbler will effectually prevent the one bolt being unlocked as already fully explained. The key has a notch in its bow or handle opposite to its bit *d*, in order to indicate the position in which the key is to be inserted into the keyhole, the said notch and the bit *d* being in all cases uppermost, but with that bit *d* inclining towards the left hand of the highest position, in case of the lock being locked, and that the key is to be inserted in preparation for unlocking; or vice versâ for locking, and whether for locking or for unlocking, the key is to be turned round one fourth of a revolution after it is inserted into the lock and before it is withdrawn, and therefore its bit *d* will be inserted through one of the branches of the keyhole, and withdrawn through the next of those branches, and so of all the four bits. And note, although five tumblers are represented in each set, that number may be varied. W, Fig. 1, is a skeleton cover plate, fastened by screws over the tumbler of the two sets D and E, so as to retain those tumblers in their proper places, but allowing them freedom of motion. The tumblers of the other two sets F and G are retained in like manner by the fixed pieces 10, which form the sides of the groove for the bolt 8 of the escutcheon lock to slide in, the end of which bolt 8, when locked, shoots close over the tumblers of all the four sets D, E, F, G, at the parts

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thereof which are nearest to the centre pin *a*. The cover plate B has an extra thickness at its inside around the keyhole, and the said end of the bolt 8 applies close behind that extra thickness when the bolt is locked and shoots across the keyhole, in order to shut the aperture thereof. And as to the remaining parts of the lock represented in the Drawings, which parts 5 (although herein-before explained in words) have not been herein-before described with references in detail to the Drawings:—The detectors (already mentioned) are four small steel springs 1, 1, 1, 1, Figures 1 and 6, and Fig. D, E, F, G, fixed at one end of each detector spring by the same supports which serve for fixing the springs *l* of the tumblers, and formed with hooked 10 catches at their other ends. One such detector spring, 1, is applied with its hooked catch opposite to a corresponding tooth 2, Fig. 1, also Fig. D, E, F, G, Sheet II., at the end of that tumbler in each set of tumblers which is farthest back from the cover plate B of the lock. And in case any one of the said farthest tumblers being overlifted or removed farther away from the centre 15 pin *a* than its proper intended position, then the said hooked catch of the detector spring 1, will catch the aforesaid corresponding tooth 2 of the said farthest tumbler, so as to prevent that tumbler from returning to its proper intended position. The lock is in such case said to be detected, and it cannot be opened even by its own true key, because that can have no action whatever 20 on the overlifted tumbler, which is detained in that state by the detector 1. And in order that the lock may become so detected in case of any other of the tumblers being so overlifted, instead of the aforesaid farthest tumbler in each set, each of the said farthest tumblers (in addition to having the aforesaid tooth 2) has also a small pin 3 fastened into it, and projecting forwards 25 from it within suitable notches which are cut out in the outer edges of all the other tumblers of the same set, and therefore, if any one of those tumblers is overlifted (as for instance by action of a picklock or false key) then the bottom of the said notch in the outer edge of the tumbler which is so overlifted will come into contact with the said pin 3, and, by pushing the same 30 outwards from the centre pin *a*, will overlift the farthest tumbler of the same set into which the pin 3 is fastened, so that the tooth 2 of that tumbler will be caught by the hooked catch of the corresponding detector spring 1 in the same manner as if the said farthest tumbler had been itself overlifted by action of the said picklock or false key; wherefore any one of the whole number of nineteen 35 tumblers being overlifted will cause the lock to be detected by one or other of the four detector springs 1, 1, 1, 1. And in order to undetect the lock, whenever it is found that its own proper key will not unlock it, and thereby it is made known that the lock has become detected in consequence of some attempt

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having been made to use a picklock or false key, then the true key, which cannot in such case be turned round in the proper direction for unlocking, must be turned round the contrary way as if for double locking, and then the part *v*, Figure K, of the bit *d* of the key, which part *v* usually acts within the notch in the talon *r* (as already explained), will in the present case pass onwards quite away from the talon *r*, and the lowest step of the next bit *e* of the key *K* will come to act against another part 4 (Figure 6, and Figure I

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upon by the said lowest step of the bit *e* of the key for the
10 undetecting. And note, when the key is turned round as aforesaid
double-locking direction, then its several bits will act altogether
against the several tumblers from their usual action in unlocking
because the bit *d* (which usually acts against the set of tumblers
acting against the tumblers G, and the bit *e* against the tumblers
15 bit *f* against the tumblers E, and the bit *g* against the tumblers F;
tumblers are thereby lifted into new positions quite different to those
which are suitable for unlocking or locking; but the said new po
suitable for undetecting the lock, because the extreme prolongati
notches at 5 in all the several tumblers of each set are thereby
20 correspondence one notch 5 with another, and all those notches
respond with the stump *m*, *n*, *o*, or *p*, which is then in the other p
same notches, wherefore the notches 5 offer no impediment to t
motion of the stumps in that direction in which they will have to
double locking, and the key, by so acting against the said part 4 of t
25 will overshoot or move the bolt I a little further forwards than
locking position (which position is represented in the Figures), and
motion of the bolt I will cause the plate II to be turned a little far
by action of its pin *q* in its transverse slot *y* in the bolt, and in
further round than represented in the Figures the plate H operate
30 the four detector springs 1, 1, 1, 1, at the same moment, because
those springs has a small lateral tooth projecting backwards from
opening *z*, Fig. 6, and Fig. II, Sheet II., in the plate H, and the ex
of each of those openings *z* comes to act against the said lateral too
detector spring when the plate H is turned further round as afo
35 thereby the detector spring is bended as much as will withdraw
catch from the tooth of the tumbler and let that tumbler go,
becomes undetected, and the same action taking place with all
detector springs 1, 1, 1, 1, at the same moment, the lock is cert
undetected, whichever of those springs it may be that has caused the

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The four openings *z, z, z, z*, in the plate *H* are so large as to have no action whatever on the lateral teeth of the detector springs 1, 1, 1, 1, during any of the ordinary motions of the plate *H* for locking and unlocking the bolt *I* of the lock, and it is only during the aforesaid further motion of the plate *H* for the purpose of undetecting the lock that the extreme ends of the said openings *Z* 5 come to act against the said lateral teeth of the detecting springs. And note, the said detectors are no part of my improvements as applied to any other kind of tumbler locks than such as are constructed according to my improvements with the tumblers arranged in distinct sets, such as *D, E, F, G*, with as many bits *d, e, f, g*, to the key *K* as there are sets of tumblers, and with 10 the stumps *m, n, o, p*, of all those sets of tumblers fastened into a circular plate *H*, which is connected by its pin *q* with the sliding bolt *I* of the lock, so as to move simultaneously therewith, that same plate *H* having also openings *z* in it for acting (as already explained) on all the detector springs at once for withdrawing them all together in order to undetect the lock. And as to the 15 escutcheon lock herein-before mentioned, 6, Figures 1, 2, 5, 6, is the centre pin for the key thereof, 7 is the key, 8 the sliding bolt, made of steel, hardened and tempered at the narrow upper end, which shuts up the key hole for the four-bitted key by shooting across the hole when the bolt 8 is locked, as already mentioned. The bolt 8 is fitted into a fixed groove 10, so as to slide freely 20 therein; it is moved by action of the bit of the key 7, upon what is called a fly talon 9, disposed behind the bolt in order to give a greater extent of end-way motion to the sliding bolt 8 than the key would give thereto, by merely acting on an ordinary talon in the bolt itself; the fly talon 9 being in effect a lever moveable about a fixed centre pin 11, and having a pin or tooth 12 projecting forwards from it into a transverse notch 13 in the bolt 8. The said 25 pin 12 being farther from the centre of motion 11 than the actual talon 14, against which the bit of the key acts, the motion which the key gives to the talon 14 by so acting is transmitted by the pin 12 to the bolt 8, with an increased extent of motion suitably for enabling the end of the bolt 8 to close 30 the keyhole of the four-bitted key, although the key 7 of the escutcheon lock is of a small size, as is shewn by the separate Figure in Sheet II. 15 are the tumblers of the escutcheon lock, six in number; the stump 16, which acts in the notches of those tumblers, being fastened into the bolt 8, and projecting forwards therefrom, through the notches of all the tumblers. 35 17 are the springs of the tumblers; and 18 a fixed guard opposite to the ends of the tumblers 15; both that guard and the springs being fixed to one of the sides 10 of the groove wherein the bolt 8 slides. 19 is a small skeleton cover plate, fastened with screws to the two sides 10; it has a key-

hole through it, and it passes across over the tumblers 15 to keep them in their places, but allows them free liberty of motion about their centre pin 20, which pin, as well as the centre pin 6, for the key, is fixed into the plate which forms the bottom part of the groove 10, and the pins stand forward from that plate through a broad notch at the end of the bolt 8. The said plate, which forms the bottom part of the groove 10, is supported on four pillars from the back plate C of the lock. The large cover plate B of the lock applies close to the skeleton cover plate 19, and there is a keyhole through the cover plate B corresponding to that through the skeleton cover 19. The additional steel plate *b, b*, of the cover plate B extends over the escutcheon lock, and the keyhole therefor is formed through the said steel plate, which prevents that keyhole being enlarged by drilling or cutting. The escutcheon lock has a detector, the hooked spring 21 of which is applied at the outside of the fixed guard 18, to which one end of the detector spring 21 is fastened for support, and the other end, which is the hooked catch, applies at the end of the farthest of the tumblers 15, as shewn in Fig. 15, Sheet II., so as to catch a tooth on that end whenever the tumbler is overlifted, in order to detain it, and thereby detect the escutcheon lock. A pin 22 is fastened to that furthest tumbler, and projects forwards therefrom within notches at the outer edges, and all the other tumblers 15, so that in case of any one of these tumblers being overlifted by picklock or false key it will, by means of that pin 22, cause the overlifting of that furthest tumbler into which the said pin 22 is fastened, and will thereby cause the detecting of the lock, in consequence of the said tooth at the end of that farthest tumbler catching and being detained by the hooked catch of the detector spring 21. The key 7 will not then be able to unlock the bolt, and, in such case, for undetecting the lock, the key 7 is to be turned round in a contrary direction, as if for double locking the bolt, whereby the bit of the key will come to set against another part 23 of the fly talon 9, so as to urge the bolt 8 a little farther endway forwards than its usual locking position, and that additional endway motion will cause the detector spring 21 to be so much bended that its hooked catch will let go the tooth of the farthest tumbler, and thereby the lock becomes undetected. A lateral tooth of the detector spring 21 enters into a long slot 24, Fig. 8, Sheet II., in the bolt 8, and it is by the end of that slot 24 coming into contact with the said tooth, that the spring 21 is bended as aforesaid, when the bolt 8 is moved with the said additional motion. Note, the aforesaid mechanism of the escutcheon lock and its detector is no part of my improvements, being the same kind of mechanism and detector as in the best locks made by my late father (and by me since his decease), under

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the Patent therefor as herein-before mentioned, but the combination of the escutcheon lock with the principal lock is an additional security thereto. And note, the complete lock represented in the Drawings may be made with its rim A, A, and back plate C, and cover plate B, as much shorter in length as the dotted lines X, V, Figure 1, so as only to include the principal lock 5 for the four-bitted key, and the escutcheon lock. The locking and of the sliding bolt I, (instead of passing through the guiding piece J, being fitted through one end of the rim A, and shooting out therefrom in the manner of ordinary locks.

And as to the combination herein-before mentioned of four door bolts for 10 fastening the door to which the lock is applied:—25, Figures 1, 3, 4, and 5, Sheet I., is the circular wheel with four spiral grooves (see also Fig. 6, and Fig. 25, Sheet II. 26, 27, 28, and 29, are the inner ends of the four door bolts, which are all shot out at once when a turning motion is given by means of a handle to the wheel 25 in one direction, and are all four drawn in 15 again at once when the wheel 25 is turned back in a contrary direction. The bolt 26 extends to the top of the door, 27 to the bottom, and the bolts 28 and 29 to the two sides of the door. The ends of those bolts are fitted into suitable openings in the rim A of the lock, and each bolt has a strong pin 30 projecting out backwards from it to pass through one of the spiral 20 grooves in the wheel 25, and the end of the pin 30 enters into a straight guiding groove, formed by pieces 31, fixed to the back plate C, by which means each bolt is free to move in a direction to or from the centre of the wheel 25, when that wheel is turned round, and its spiral grooves act on the pins 30. The centre part of the wheel 25 is a short axis 25 which is fitted into suitable sockets, one on the back plate C, and the other in the cover plate B, see Figures 3, 4, and 5, and there is a square hole through the centre of the axis for the reception of a square at one end of a spindle, which will pass through a round hole in the door from the front side thereof, and may have any convenient kind of handle on 30 that end which is in front at the outside of the door, so that by turning the said outside handle the wheel 25 within is also turned, and shoots out or withdraws all the four bolts at once, as already explained; but such motion of the wheel 25 supposes the sliding bolt I of the lock to be withdrawn or unlocked, for after the wheel 25 has been turned by means of its 35 handle, so as to shoot out all the four bolts, as in Fig. 1, in order to fasten the door by them, then a notch in the exterior rim of the wheel 25 will have come round exactly opposite to the end of the sliding bolt I of the lock, so that the said bolt being then locked by action of its four-bitted key K, will shoot out

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through the guiding piece J into the said notch, and thereby the wheel 25 will become fastened and prevented from turning back, so as to withdraw the four door bolts and unfasten the door, until the bolt I has been first unlocked and withdrawn from the said notch in the rim of the wheel 25. Note, the extreme end of the bolt I is cut away into a hollow curve (see Fig. I., Sheet II., so as to avoid interference with the pin 30 of the bolt 29. That bolt 29 extends across over the centre of the lock (see Fig. 3), and has a large oblong opening cut through it, in order to avoid any interference with that additional thickness of the cover plate B, which (as already mentioned) surrounds the keyhole. For the four-bitted key the said additional thickness extends quite through the opening through the bolt 29, and the sliding bolt 8 of the escutcheon lock (which bolt passes close behind the said additional thickness) is not interfered with by the large bolt 29 passing immediately before it. And note, the four bolts 26, 27, 28, 29 (or two of them), may, if desired, have cross branches upon them near to the borders of the door, with extra belts on those branches, so as to obtain six, or eight, or ten or more bolts for fastening the door; all those bolts, however numerous, being bolted or withdrawn at once by the aforesaid action of the same wheel 25. And note, the said combination of four door bolts to be moved all together by one action of turning a handle at the outside of the door, and a circular turning wheel with four spiral grooves within, is no part of my improvements, but is advantageous to be combined therewith, because the four-bitted key K, although of a small size, and only shoots one bolt I, yet by means of the said combination it effectually secures four or more strong door bolts, whereas if the shooting of the bolt I is to fasten the door in the usual manner of ordinary locks, and that door is of a large size, then the four-bitted key and the interior mechanism of the lock should be of larger dimensions than in the Drawings to obtain strength. And in case of a lock of the kind aforesaid being constructed for a latch, in order that it may fasten of itself (as already mentioned), then the sliding bolt I is to have a spring applied to the tail end or other convenient part of the bolt I, as shewn in Figure 37, Sheet II., at S, and either with or without a lever, such as R, in order to urge the bolt endways forwards, so that it will be a spring or latch bolt, and the notches in all the several tumblers must be plain slots at their inner ends *w, w* (in the manner shewn in Fig. 37, Sheet II.), so as not to interlock with or detain the stamps *m, n, o, p*, when the spring bolt I is withdrawn and unlocked (as in Fig. 37), but only when it is locked. The said spring bolt I being unlocked by action of its four-bitted key K, so as to draw back the spring bolt I in opposition to its spring S, and withdraw the locking end of the spring bolt I from the aforesaid notch in the rim of the

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wheel 25, and that wheel being immediately turned round for unbolting the four door bolts before the action of the four-bitted key ceases, then after that key is withdrawn the end of the spring bolt I will remain pressed in contact with the rim of the wheel 25 by the reacting force of the spring S of the bolt I, and will continue in that state so long as the door remains unfastened, but whenever the wheel 25 is turned round so as to shoot the four door bolts, and thereby fasten the door, then the notch in the rim of the wheel 25 will be brought opposite to the end of the spring bolt I, and that end will suddenly or latch of itself into the said notch without any action of the four-bitted key; and when the spring bolt has so latched; the notches of all the tumblers will interlock the stumps *m, n, o, p*, so as to secure the circular plate H, and the spring bolt I from moving, and thereby that bolt I will fasten the wheel 25 in the same manner as already described to be done in case of a lock, by shooting the bolt, by turning the four-bitted key; and the unlocking and withdrawing of the spring bolt I must be performed with that key in the same manner as already fully described, except as to the unlocking being in opposition to the spring S of the bolt I.

Having now described my said improvement in locks and latches to be used for fastenings, I, the said John Chubb, do hereby declare that the new Invention whereof the exclusive use is granted to me by the Letters Patent herein-before in part recited, consists in the following particulars:—

Firstly, the improvement herein-before described and represented in those parts of the Drawings hereunto annexed, which are marked with capital and small letters of the alphabet for references to the said parts; the nature of the improvement being to combine four, three, or two distinct sets of tumblers (which sets are arranged around the centre of motion for the key) so that the whole number of tumblers in all those sets will all be lifted simultaneously by suitable steps on as many bits of the key as there are sets of tumblers, and a like number of stumps (which are adapted to act in the notches of the several sets of tumblers) being all fastened into one circular plate which is moveable about the same centre of motion as the key, and is connected with the sliding bolt of the lock or latch by a pin projecting from the plate, and entering into a traverse notch in the bolt (or other suitable means of connection), so that the bolt cannot be moved with its endway motion without communicating a small corresponding extent of circular motion to the plate and to the stumps, which are fastened into it, by which means all the tumblers in the different sets will act in concert for preventing any motion of unlocking, unless all the tumblers are duly lifted (each one to its own proper intended position) by action of the several steps on the different bits of the key, and any one

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tumbler in any of the different sets not being sufficiently lifted, or being over lifted, will effectually detain the circular plate, and consequently the bolt, from being moved.

Secondly, the improvement herein-before described of combining with
5 the aforesaid first improvement other ordinary and well-known parts of locks,
as represented in those parts of the Drawings hereunto annexed which are
marked with numeral characters for references to the said parts, and which
parts so marked with numerals are not of themselves part of my Invention,
but the combination thereof with the aforesaid first improvement (the parts
10 of which are represented by letters of the alphabet) is advantageous. Namely,
the detectors I, I, I, I, applied to the several sets of tumblers are each of
them individually the same as an individual detector heretofore applied to
one set of tumblers, and each detector acts in the same manner for detecting
the set of tumblers to which that detector belongs, but as regards undetecting
15 the lock or latch, the manner in which the detectors are combined in the
lock or latch herein-before described with the circular plate H, and the
notches z, z, z, z, therein is a new improvement, which causes all the
several detectors to be bended back simultaneously, so as to undetect the lock
or latch whichever of the different detectors may have detected it. Also in
20 the act of undetecting the lock or latch all the tumblers are lifted by the key
into new positions (different from their positions for unlocking), as already
explained. Also the escutcheon lock, whereof the parts are marked with the
numeral characters from 5 to 24 for reference to those parts, is by itself a
complete lock, similar to the best locks heretofore made, but its combination
25 with the aforesaid first improvement in one lock or latch, in the manner
represented and described, gives additional security against injury to the
interior mechanism of the lock by picklocks or false keys. Also the turning
wheel with four spiral grooves for shooting four door bolts at once to fasten
the door, the parts of which are marked with the numeral characters from 25
30 to 31 for reference to those parts, the said parts so marked are the same as
heretofore made, but the combination thereof in the same lock or latch with
the aforesaid first improvement is advantageous, by giving the greatest strength
of fastening to resist violence, and also the greatest security against picklocks
or false keys, with the use of a small and portable key, as already stated.

35 In witness whereof, I, the said John Chubb, have hereunto set my
hand and seal, this Twelfth day of June, One thousand eight hundred
and forty-seven.

JOHN (L.S.) CHUBB.

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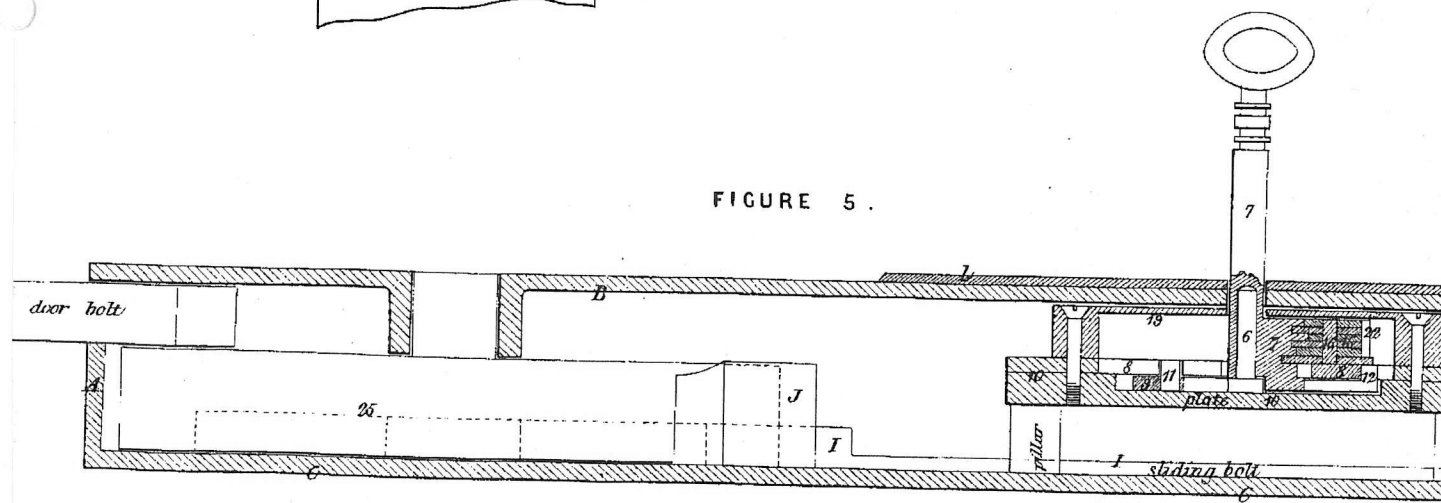
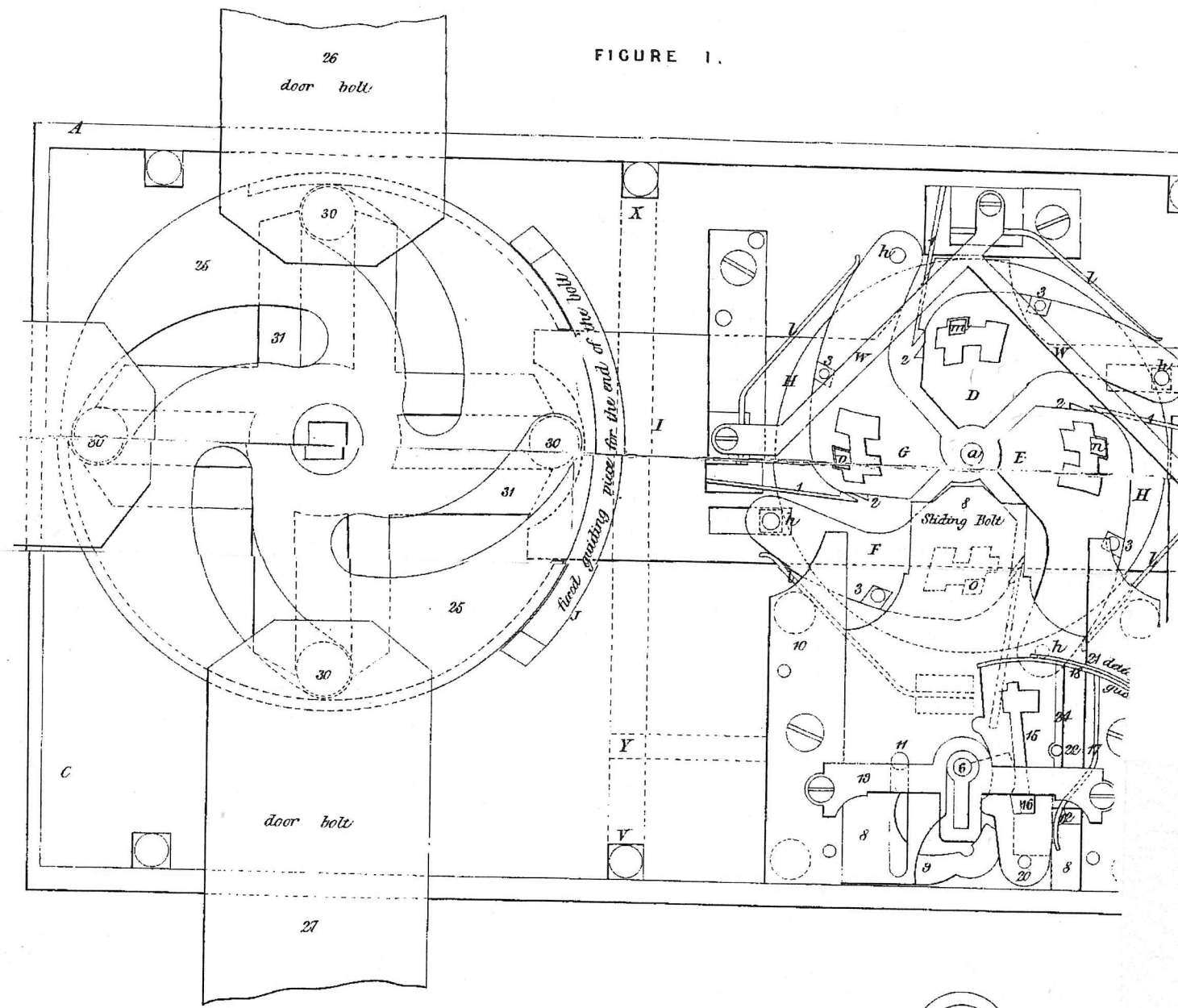
DUCKWORTH.

AND BE IT REMEMBERED, that on the Twelfth day of June, in the tenth year of the reign of Her Majesty Queen Victoria, the said John Chubb came before our said Lady the Queen in Her Chancery, and acknowledged the Instrument aforesaid, and all and every thing therein contained and specified, in form above written. And also the Instrument aforesaid 5 was stamped according to the tenor of the Statute made in the fifty-fifth year of the reign of His late Majesty King George Third.

Inrolled the Twelfth day of June, One thousand eight hundred and forty-seven.

LONDON :

Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1857.



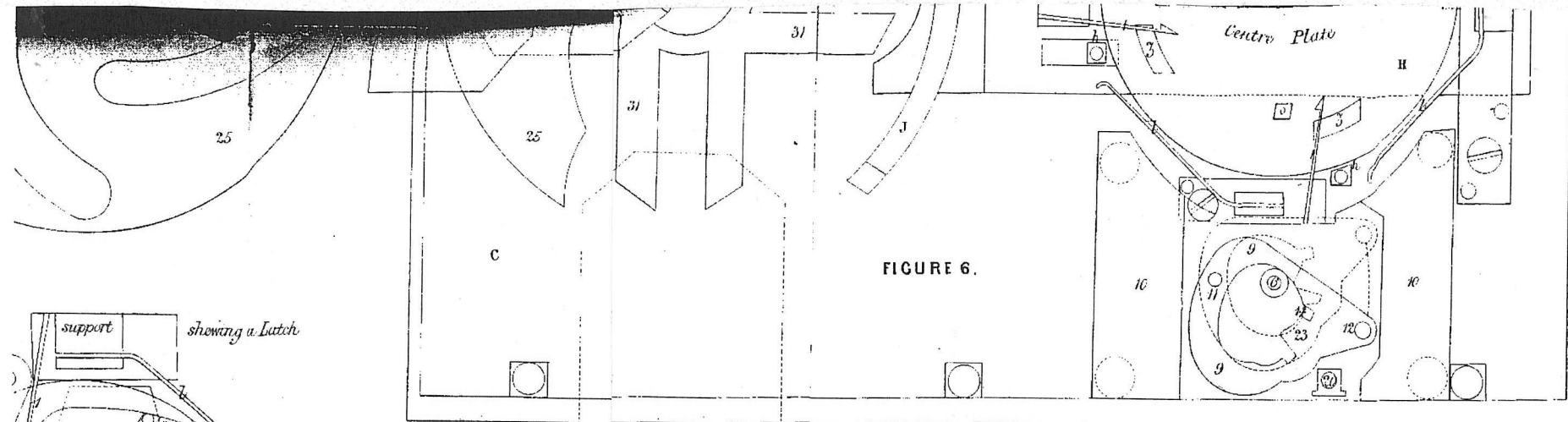


FIGURE 6.

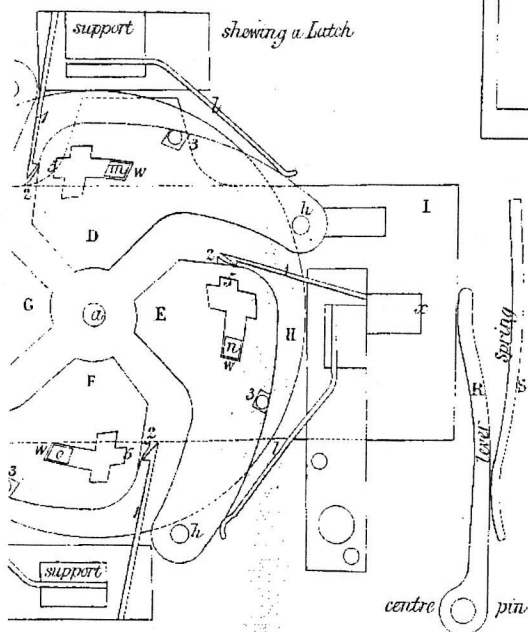
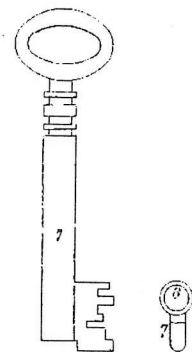


FIGURE 7.

Parts of the Escutcheon Lock.



FIGURE

Fly latch

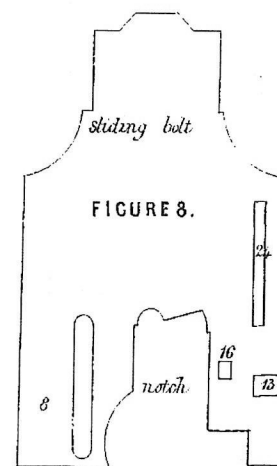
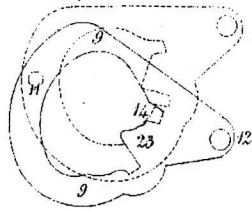


FIGURE 8.

FIGURE 15.

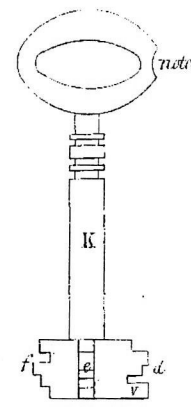
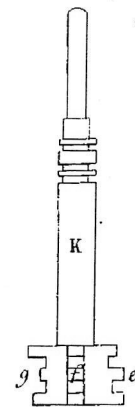
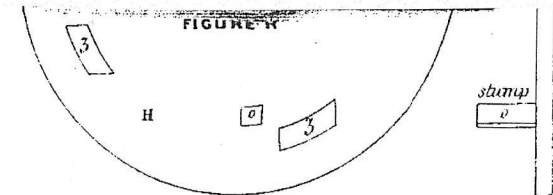
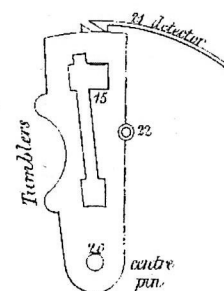
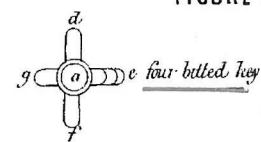


FIGURE K.



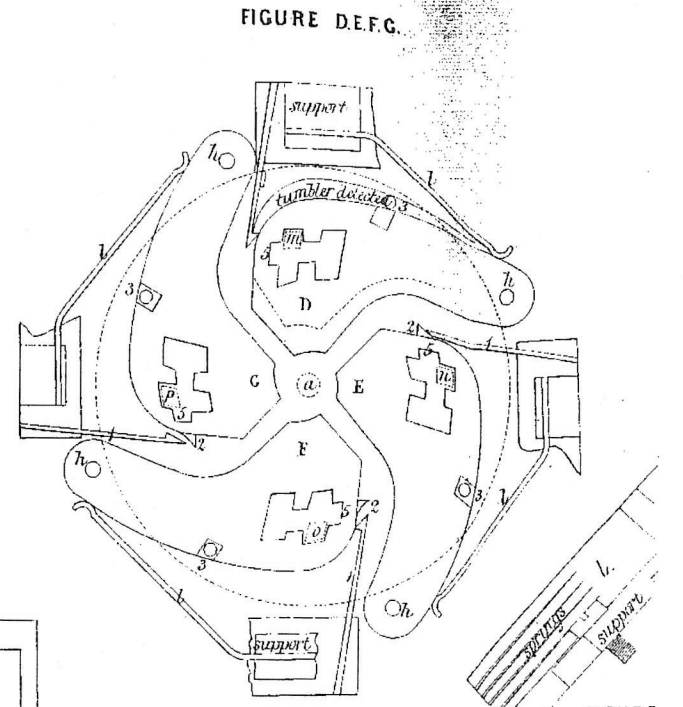
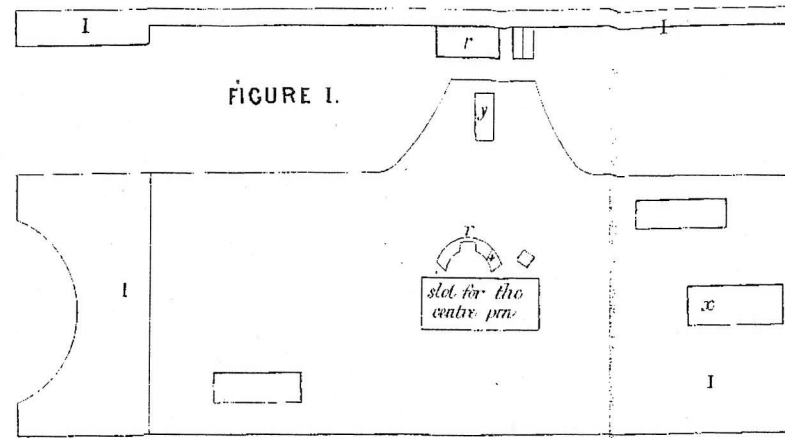
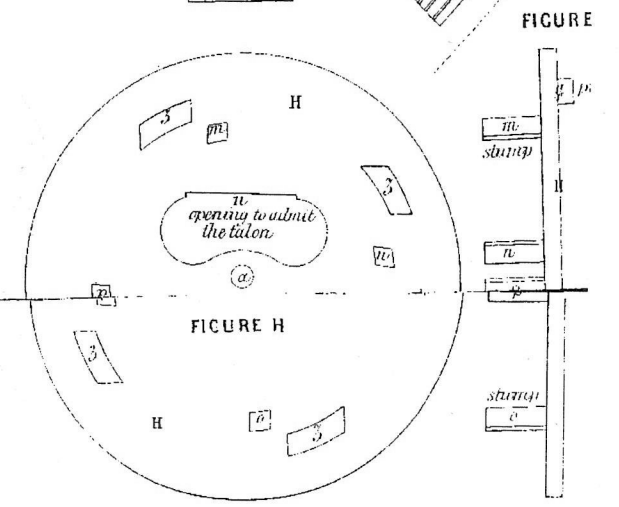
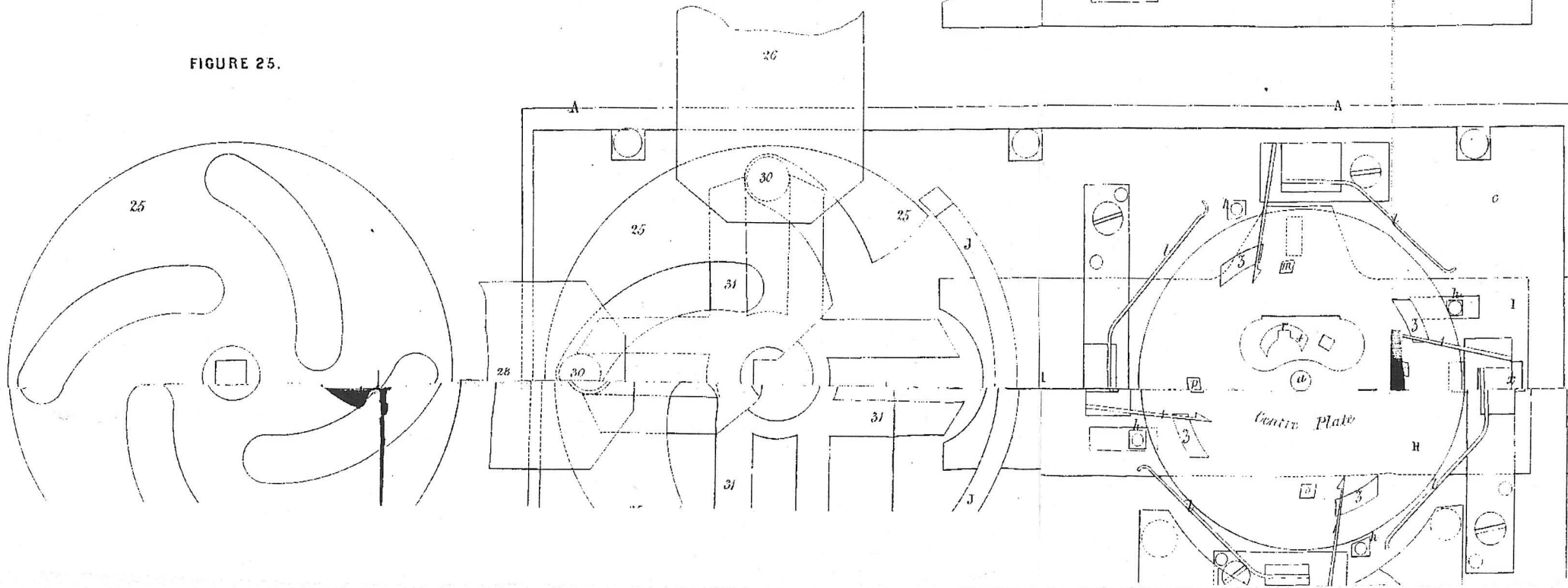


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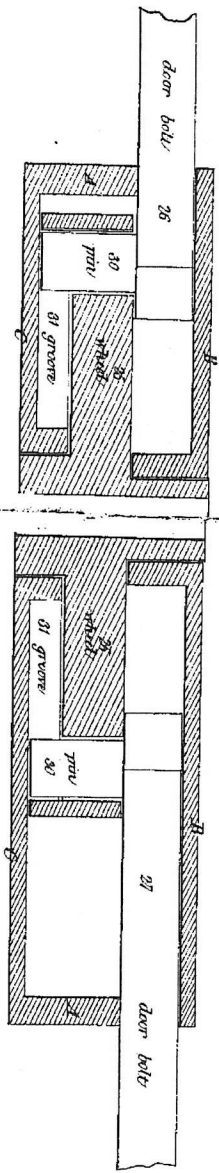


FIGURE 4.

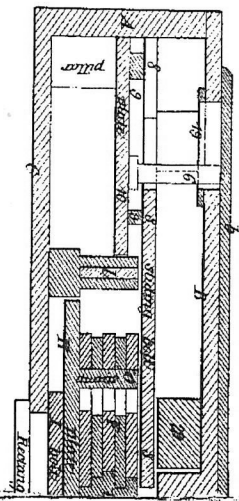


FIGURE 2.

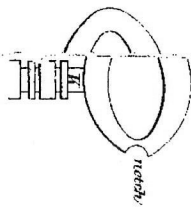
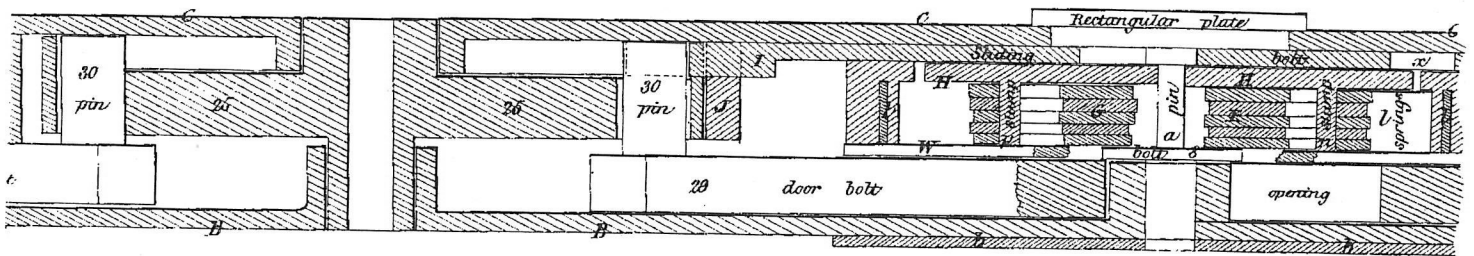


FIGURE 3.



made in wood