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[Second Edition.]



A.D. 1865, 26th AUGUST. N^o 2198.

Locks.

LETTERS PATENT to Edmund Dorman Hodgson, of 5, Paper Buildings, Temple, for the Invention of "**IMPROVEMENTS IN THE MANUFACTURE OF LOCKS.**"

Sealed the 16th February 1866, and dated the 26th August 1865.

PROVISIONAL SPECIFICATION left by the said Edmund Dorman Hodgson at the Office of the Commissioners of Patents, with his Petition, on the 26th August 1865.

I, **EDMUND DORMAN HODGSON**, of 5, Paper Buildings, Temple, do hereby
5 declare the nature of the said Invention for "**IMPROVEMENTS IN THE MANUFACTURE OF LOCKS,**" to be as follows:—

This Invention has for its object improvements in the manufacture of locks. In order to obtain greater security I employ in addition to the ordinary bolt and tumblers another bolt actuated by the same key, and by one movement
10 or rotation thereof immediately the first bolt is shot the second bolt is by the continued rotation of the key locked into or behind the first bolt, so as to block it.

In a similar manner three or a greater number of bolts may be shot in succession by a single movement or rotation of the key, each bolt in succession
15 locking the bolt shot immediately before it. There may be tumblers in

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connection with each bolt, or one or more only of the bolts may be furnished with tumblers. The last bolt of the series also I block by means of a spring blocking piece actuated from the keyhole by the end of the key. The end of the key is notched like that of a Bramah lock, and the instrument against which it comes when introduced into the keyhole carries corresponding projections; the key when put into the keyhole pushes back this instrument, and with it the spring block of the last bolt, and having done this it will have entered sufficiently far to be turned round to act on the bolts in succession. 5

For safe and similar locks where bolts are required to be shot from two or more sides of the lock case the blocking bolts above mentioned may be made to project out of the lock case; otherwise they may be entirely contained within it. The spring blocking working in the manner herein before described may be used in tumbler locks where but one bolt is employed. 10

According to another arrangement a cylinder or barrel is employed, and on this are teeth or projections which when the barrel is turned move first the main bolt and then a secondary bolt, which comes in behind it and blocks it; if desired more than one such secondary bolt may be employed. The cylinder or barrel is rotated by the key, it has a keyhole in its centre, and the first act of the key when turned is to arrange tumblers which before by their gatings retained the cylinder or barrel; as soon as the cylinder or barrel is free the key commences to rotate it and cause it to act on the bolts. In some cases I employ in conjunction with a straight bolt, to which tumblers may be applied if desired, a bolt of a semicircular form (or it may be greater or less than a semicircle); the key in locking first shoots the straight bolt and then rotates the curved bolt so as to cause its end to lock into the tail of the said straight bolt. I also in some cases employ in combination two semicircular bolts (or they may be other portions of a circle), one to act as the main bolt and the other as a secondary bolt to block it. The key after arranging tumblers or otherwise rotates the main bolt, and so causes one of its ends to pass out of the lock case on one side, and after travelling over to enter it again on the other side; in doing this it catches into the door or lid to be secured when the key is withdrawn from the keyhole, the secondary bolt is thrown up by a spring and blocks it. The key is made with notches at the end like a Bramah key, and there are corresponding projections at the bottom of the keyhole on an instrument in connection with the secondary block. When the key is introduced into the keyhole to unlock or withdraw the bolt it first depresses the secondary bolt, and then having entered just sufficiently far it can be turned round to move the main bolt. 15
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Another part of my Invention relates to improvements on an Invention for which a Patent was granted to me dated 14th March 1865 (No. 714), and which consisted in part in securing the doors of safes where the doors were made to slide in place of opening on hinges by introducing blocking pieces into the spaces in which the doors moved. According to my present Invention I actuate such blocking pieces by means of the safe locks. I connect the blocking piece with the bolt by levers turning on centres so that the motion of the blocking piece is transverse of or at an angle to the direction in which the bolts shoot. A similar motion may be given to the blocking piece from the lock bolt by means of inclines. Also in the Specification of my said former Patent I have described a method of securing the doors of safes when they work on hinges by means of blocking bars made to enter behind lugs on the door, but such blocking bars were employed on two sides only of the door; I now employ them on all four sides. By a combination of levers on the door actuated by a handle the blocks are all simultaneously drawn inwards to secure the door, and pushed outwards to free it when unlocked. The levers are not attached to the blocks, but they catch into them when the door is closed, and leave them when the door is opened.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Edmund Dorman Hodgson in the Great Seal Patent Office on the 26th February 1866.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, EDMUND DORMAN HODGSON, of 5, Paper Buildings, Temple, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Twenty-sixth day of August, in the year of our Lord One thousand eight hundred and sixty-five, in the twenty-ninth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Edmund Dorman Hodgson, Her special licence that I, the said Edmund Dorman Hodgson, my executors, administrators, and assigns, or such others as I, the said Edmund Dorman Hodgson, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time, and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for **"IMPROVEMENTS IN THE MANUFACTURE OF LOCKS,"** upon the condition (amongst others) that I, the said Edmund Dorman Hodgson, my executors or adminis-

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trators, by an instrument in writing under my, or their, or one of their hands and seals, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said Edmund Dorman Hodgson, do hereby declare the nature of the said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof, that is to say :—

This Invention has for its object improvements in the manufacture of locks. In order to obtain greater security I employ in addition to the ordinary bolt and tumblers other bolts actuated by the same key, and by one movement or rotation thereof, immediately the first bolt is shot the second bolt is by the continued rotation of the key locked into or behind the first bolt so as to block it, and so with the third bolt. In this manner three or greater number of bolts may be shot in succession by a single movement or rotation of the key (which is an ordinary single bitted key), each bolt in succession locking the bolt shot immediately before it. There may be tumblers in connection with each bolt or one or more only of the bolts may be furnished with tumblers. For safe and similar locks where bolts are required to be shot from two or more sides of the lock case, the blocking bolts above mentioned may be made to project out of the lock case, otherwise they may be entirely contained within it.

Figure 1 is a plan of a lock constructed with a series of bolts blocking each other in succession in the manner above stated; Figure 2 is a similar view with the bolts shot out as when locked; in both views the cover plate of the lock is removed. Figures 3 shew the parts separately. *a* is the first bolt of the lock; it has a stump *a*¹ upon it; *b* is a tumbler working therewith, it turns upon a pin *b*¹, fixed into the lock plate; and this pin also serves as a guide for the bolt *a*; it passes through a slotted hole in the bolt; *c* is the second bolt of the series; it has slots *c*¹, *c*¹, in it, through which pins fixed in the lock plate project; one of these pins serves as a centre for the tumbler *d*, which works with the stump *c*² on the bolt. As soon as the first bolt *a* is shot by the key in the usual way the bolt *c* immediately follows and its tail *c*² enters the notch *a*² in the bolt *a*; *e* is another or extra bolt coupled with the bolt *c* by the lever *f* turning at *f*¹ on a stud on the lock plate; *g* is a third bolt in the series, and *g*¹, *g*¹, are guide slots therein through which studs on the lock plate project; *h* is a tumbler turning on one of these studs and working with the stump *g*² on the bolt. When the key as it is turned

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round comes up to this bolt, it, as with the previous bolts, places the tumbler and then shoots the bolt forward, and the rear end of the bolt enters the recess c^4 in the bolt c , and so blocks it; i is the last bolt of the series; it works in the same way as the other bolts; it has a stump i^1 upon it with which the tumbler j works; this tumbler has a separate spring j^1 fixed in the lock plate. When the bolt i is shot its tail i^2 enters a recess g^3 in the bolt g and blocks it, the point i^3 of the bolt i also enters behind the bolt a and further secures it. It will be seen that this lock can only be picked by operating in succession on each bolt of the series. In locks for large safes each of the bolts a , c , g , and e may be formed as is indicated at k in the Drawing. The last bolt of the series may if desired be blocked by means of a spring blocking piece actuated from the key hole by the end of the key. The end of the key is in this case notched like that of a Bramah lock, and the instrument against which it comes when introduced into the keyhole carries corresponding projections; the key when put into the keyhole pushes back this instrument and with it the spring block of the last bolt, and having done this it will have entered sufficiently far to be turned round to act on the bolts in succession. The spring block working in the manner herein-before described may be used in locks where but one bolt is employed.

Figure 4 is a plan of a lock in which a spring bolt is employed to block the main bolt as soon as it is shot. Figures 5 and 6 are sections of this lock taken at the line 1, 1, Figure 4; in one of these sections the bolt is in the position it occupies when shot, in the other it is shown withdrawn. In the lock shown there is only one bolt besides the blocking bolt, but it is evident that a spring blocking bolt may be employed when a greater number of bolts are employed; a , a , is the main bolt on which the key acts in the usual manner, it may if desired be furnished with tumblers as is usual, and in this case the gating of the tumblers should be such that the tumblers will take any back pressure which may be applied to the bolt a ; b is the spring or blocking bolt fixed on a spring arm b^1 secured to the lock plate by the screw c . There is a hole through the spring arm b^1 surrounding the key pin d , and in this hole a ring e is fitted so as to be able to turn round, and in this ring are small ribs or feathers projecting up to different heights and corresponding with notches cut in the end of the barrel of the key. When the key is put into the lock it presses down the spring arm b^1 , and when the key is stopped by the back plate of the lock it will have moved this arm just sufficiently to bring the blocking bolt b opposite the slot a^1 , cut for it in the tail of the main bolt, and then the key on being turned is able to act and shoot back the bolt. False notches may be made in the tail of the bolt a , to

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catch the blocking bolt *b*, should the bolt *a* be pressed back when the blocking bolt is incorrectly set.

Figure 7 is a plan of a lock (with the cover removed) in which in another manner a bolt is by means of a spring caused to enter behind the main bolt after it has been shot so as to block it. Figures 8 show some of the parts separately. *a* is the main bolt, upon it the tumbler *b* is centred at *b*¹; *c* is the blocking bolt, it is placed behind the main bolt, and arranged to slide vertically, being guided by slots *c*¹ in it, which studs on the lock plate enter; it is pressed downwards by the spring *c*²; *c*³ is the part of this bolt which descends behind the main bolt *a* so as to block it; *c*⁴ is a stump working with the tumbler *b*; *d* is another lever or tumbler fitted with a spring *d*¹ pressing it towards the centre pin of the key. The action is as follows:—The key first places the lever *d* so as to allow the stump *c*⁴ to rise in the slot formed for it in the bolt, the key then raises this stump to a suitable height by acting on the blocking bolt *c*, and at the same time it lifts the part *c*³ of this bolt up from behind the end of the bolt *a*, afterwards the key places the tumbler *b* and shoots back the bolt *a*; *c*⁵ is a stud on the blocking bolt *c* which for additional security catches into the top of the bolt *a* when it is shot.

Figure 9 is a plan with the cover removed of a lock in which the spring blocking bolt is arranged to turn on a centre in a similar manner to a tumbler.

Figure 10 is a similar view to that shewn at Figure 9, but with the parts of the lock in such a position that the bolt may be drawn back or unlocked. Figures 11 show some of the parts separately. *a* is the main bolt sliding on guide pins *a*¹, *a*², on the lock plate; *b* is the blocking bolt turning on the pin *a*¹; it is acted on by a spring *b*¹, which when the bolt *a* is shot brings up its tail *b*² behind the bolt *a* so as to block it. *b*³, *b*³, are stumps on the piece *b*, projecting through it on each side, and on the under side they enter slots or gatings in the bolt *a*. *c* and *d* are tumblers with springs *c*¹ and *d*¹; these tumblers work with the upper ends of the stumps *b*³, thus in unlocking the key has first to arrange the tumblers *c* and *d* so that their gatings may allow the blocking bolt *b* with its stumps to move; the key then acts on this blocking bolt and depresses its end *b*² clear of the back of the bolt *a*, at the same time bringing the stumps *b*³ into the longitudinal part of their slot in the bolt *a*; lastly, the key shoots back the bolt which is then free, the springs bring back the parts *b*, *c*, and *d*. In locking the key arranges these parts before shooting the bolt.

Figure 12 is a plan, with the cover removed, of another lock with a spring blocking bolt turning on a centre or pivot. Figures 13 shew some of the

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parts separately. a is the main bolt sliding on a guide pin a^1 , and having a stump a^2 upon it. b is the blocking bolt fitted with a spring, and turning on the pin a^1 ; its thickened part b^1 at the back comes behind the bolt a . This part b^1 is recessed to receive the tail of the bolt a ; and it also has false
5 notches formed in it, as is shown, corresponding with similar notches in the tail of the bolt a . c is an ordinary tumbler with a spring; it also turns on the pin a^1 ; more than one such tumbler may be employed if desired. In this arrangement, if back pressure is put on the bolt with the object of picking the lock the pressure is taken first by the tumbler or tumblers c , the gating
10 in the bolt b being made wide. Should the arrangement of tumblers be found (as it may be) the bolt a will go back on to the blocking bolt b , and be caught by the false notches therein, and from these it cannot be freed without again letting down the tumblers; d is a lump on the lock case which supports the blocking bolt b . In some cases I employ in conjunction with a
15 straight bolt, to which tumblers may be applied if desired, a bolt of a semicircular form (or it may be greater or less than a semicircle), the key in locking first shoots the straight bolt, and then rotates the curved bolt, so as to cause its end to lock into the tail of the said straight bolt.

Figure 14 is a plan of the lock with the cover plate removed, and with
20 the bolt drawn back as when unlocked. Figure 15 is a similar view, but with the bolt shot. a is the main bolt which the key is able to move from one position to the other in the usual manner, first arranging the tumblers b which turn on the stud b^1 , fixed into the lock plate so that their gatings may allow the stump a^1 of the bolt to pass. c is another or blocking bolt which is
25 moved by the key in a curved course in which it is guided by the slots c^1, c^1 , formed in it, through which studs on the lock plate project; this bolt has a stump c^2 upon it which works with tumblers d turning on a stud d^1 on the lock plate. The bolt c it will be seen when shot descends behind the end of the bolt a and blocks it, so that any back pressure put upon the bolt a , with
30 the object of feeling the gating of its tumblers, is taken by the bolt c , and is transferred to the lump e on the lock plate, so that it does not fall on the tumblers; thus the object is defeated. In using the key in locking it first arranges the tumblers b and shoots the bolt a , and then it arranges the tumblers d and shoots the bolt c behind the bolt a ; in unlocking the order is
35 reversed, the bolt c is first drawn back, and then the bolt a follows. I also in some cases employ in combination two semicircular bolts (or they may be other portions of a circle), one to act as the main bolt, and the other as a secondary bolt to block it. The key after arranging the tumblers or otherwise rotates the main bolt, and so causes one of its ends to pass out of the

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lock case on one side, and after travelling over to enter it again on the other side, in doing this it catches into the door or lid to be secured when the key is withdrawn from the keyhole; the secondary bolt is thrown up by a spring and blocks it.

Figure 16 shows a plan of a lock thus constructed, the cover being removed. 5
 a is the main bolt, which is shown as it appears when shot; b is the blocking bolt; it is held between guides c, c . Under one end of the bolt b is a spring d , tending to throw it upwards, so that when the bolt a is shot it rises up behind it and blocks it; in unlocking or shooting back the bolt a the key first presses 10
 down the blocking bolt b , and then when turned round it catches on the horn a^1 of the bolt a and carries it forward, causing it to enter between the guides c, c , and over the blocking bolt b . When the bolt a is fully withdrawn the key comes round again to the keyhole and is withdrawn. In locking or shooting the bolt forward out of the lock the key when introduced enters 15
 between the horns a^1 and a^2 , and as it is turned it carries the bolt with it, until when fully locked in consequence of the eccentricity of the keyhole to the guides c, c , the key escapes past the shorter horn a^2 , and is free to be withdrawn at the keyhole, at the same time the blocking bolt b is thrown up by its spring behind the bolt a . The key may in this case, as in Figures 4, 5, and 6, be made with notches at the end, like a Bramah key, there being 20
 corresponding projections at the bottom of the keyhole on an instrument in connection with the secondary block. Or in place of locking the curved main bolt by means of a spring blocking bolt, a bolt shot by the key may be employed.

Figure 17 is a plan of such a lock with the cover removed; Figures 18 25
 shew some of the parts separately. a is the curved bolt which the key partly rotates in the manner described in respect to Figure 16. b is a straight blocking bolt which the key acts on after it has shot the main bolt a ; it slides on the guide pins b^1, b^1 ; b^2, b^3 , are notches at the top of the bolt for the stump c ; it is mounted on a lever d which is pressed downwards by the 30
 spring d^1 ; the key as it comes round raises the lever d so as to clear the stump c from the notch b^2 in the bolt; the bolt b is then shot, and the stump redescends into the notch b^3 and secures the bolt. The bolt b when shot blocks the bolt a at both ends, the bolt a having recesses a^1, a^1 , for the ends of the bolt c to enter. In place of the lever d and stump c ordinary tumblers 35
 may be applied.

Another part of my Invention relates to improvements on an Invention for which a Patent was granted to me, dated 14th March 1865 (No. 714), and which consisted in part in securing the doors of safes where the doors were

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made to slide in place of opening on hinges by introducing blocking pieces into the spaces in which the doors moved.

According to my present Invention I actuate such blocking pieces by means of the safe locks. I connect the blocking piece with the bolt by levers
5 turning on centres, so that the motion of the blocking piece is transverse of or at an angle to the direction in which the bolts shoot.

Figure 19 is a front view of a safe with sliding doors having a lock with a blocking piece combined with the bolt in such manner that when the bolt is shot the blocking piece is thrown forward into the space into which the doors
10 slide on opening. Figure 20 is a horizontal section taken at the line A, A, Figure 19; and Figure 21 is a vertical section taken at the line B, B, Figure 19.

These Figures were shown in the Specification of my said former Patent with a view to the explanation of the construction of the safe, and of the
15 general principle of applying blocks. *a, a*, is the frame; *b, b*, the sliding doors on the two sides; *c* is the central door to which the lock is fixed; *d* is the lock, and *e* is a bar fixed to its bolt, so that when the bolt is shot the bar is raised. *f, f*, are rods jointed to the end of the bar *e* and linking it with
20 levers *g, g*, centred at *g¹* to the frame *a*; *h* is a blocking bar or piece fixed at the ends of the levers *g*, and which when the bolt of the lock is raised by the motion communicated to the levers *g* brought down in between the sliding doors *b, b*, so as to block them and prevent them moving. A similar motion may be given to the blocking piece from the lock bolt by means of
25 inclines.

This arrangement is shown in plan at Figures 22, and in front view at
Figure 23. *a, a*, is a lock fixed to the door, or it may be to the frame of the press; *b, b*, are inclines fixed to the lock bolt; *c, c*, are similar inclines on the blocking piece, and these by working with the inclines *b* throw the
30 blocking piece forward when the bolt is shot. In place of these arrangements a screw may be employed to throw the blocking piece forward. This arrangement is particularly applicable when a Bramah lock is employed.

Having thus described the nature of my said Invention, and the manner of performing the same, I would have it understood that what I claim is,—

35 First, the use of three or more bolts acted on by the same key and key bit and by the same rotation thereof, blocking each other in succession as described in respect to Figures 1, 2, and 3.

Second, I claim the blocking a bolt shot by the key by means of a blocking bolt caused by a spring to enter behind the first-mentioned bolt when it is

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shot, as is described in respect to Figures 4, 5, 6, 7, 8, 9, 10, 11, 12, and 13. I also claim the arranging the said spring blocking piece to be withdrawn by means of the endway pressure of the key, as is described in respect to Figures 4, 5, and 6.

Third, I claim the combining with a straight main bolt a blocking bolt 5 entering behind it when it is shot at a convenient curve or angle, as described in respect to Figures 14 and 15.

Fourth, I claim the combining a blocking bolt with a semicircular or curved main bolt as is described in respect to Figures 16, 17, and 18; also the constructing the said blocking bolt of a semicircular or curved form, and 10 acting upon it by means of a spring, as illustrated in Figure 16.

Fifth, I claim (in respect to constructing locks for securing the doors of safes when the doors are arranged to slide) the combination of a blocking piece with the bolt of the lock in such manner that when the bolt is shot the blocking piece is thrown forward into the space the sliding door would 15 enter in opening. I also claim the combining the blocking piece with the bolt of the lock by means of levers, as is described in respect to Figures 19, 20, and 21. I also claim the combining inclines with the bolt of a lock so as to cause it to throw forward a blocking piece, as is described in respect to Figures 22 and 23. 20

In witness whereof, I, the said Edmund Dorman Hodgson, have hereunto set my hand and seal, this Twenty-sixth day of February, in the year of our Lord One thousand eight hundred and sixty-six.

E. DORMAN HODGSON. (L.S.)

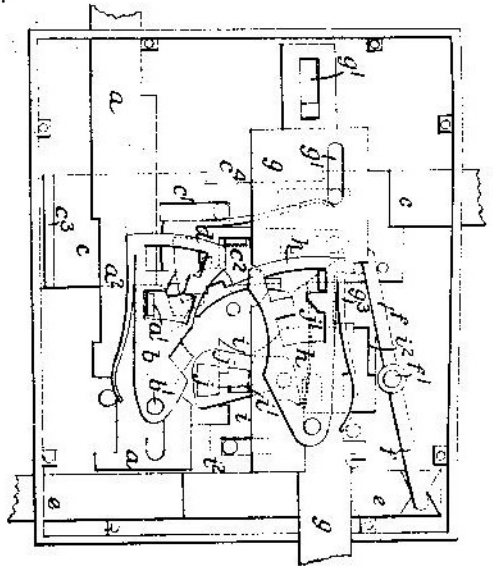


FIG. 1.

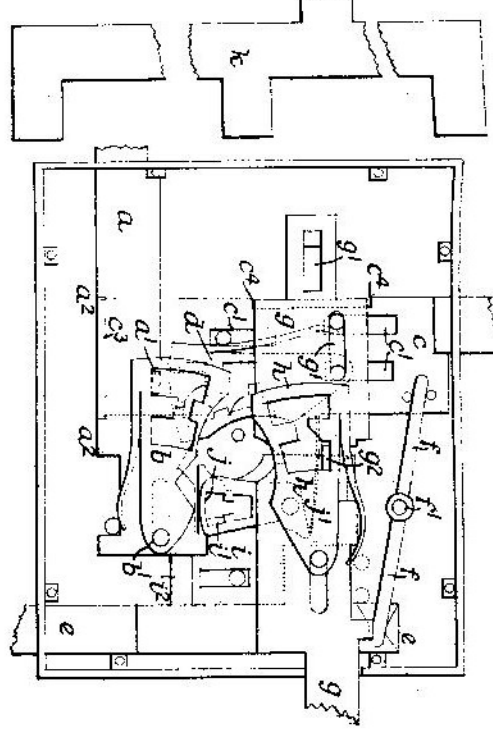


FIG. 2.

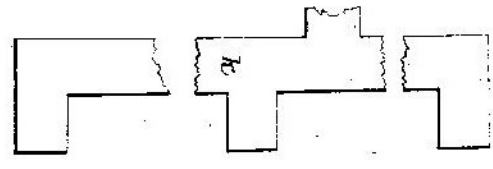


FIG. 9.

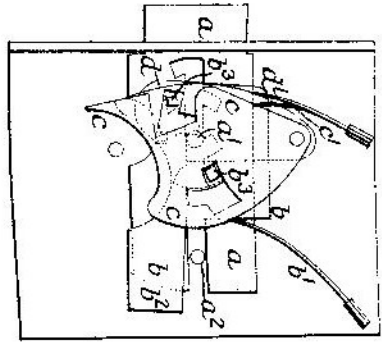
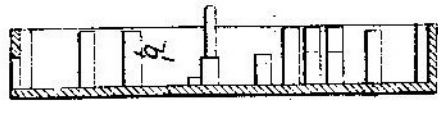
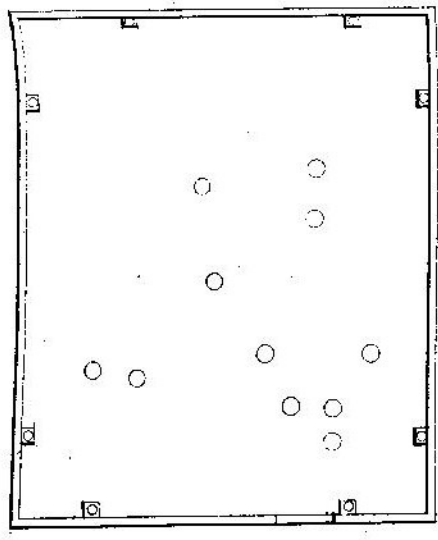
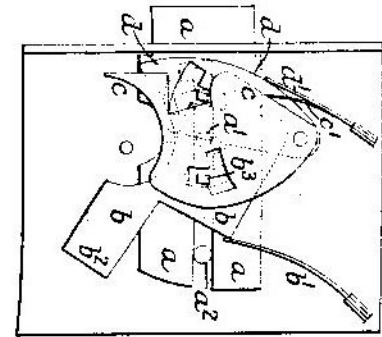


FIG. 10.



The dotted drawing is not-colored.

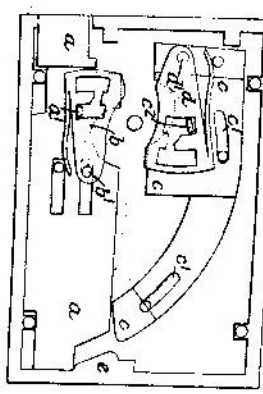


FIG. 16.

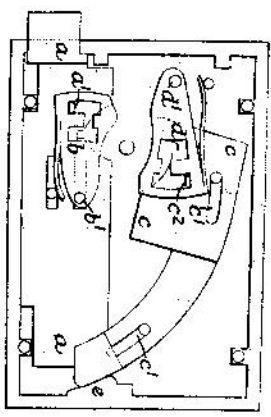


FIG. 18.

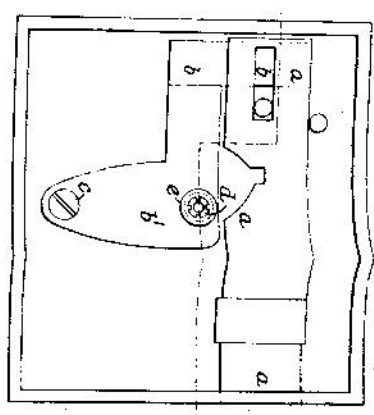


FIG. 1.

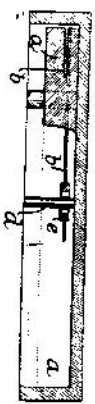


FIG. 8.



FIG. 9.

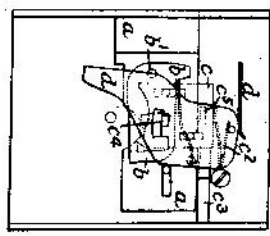


FIG. 7.

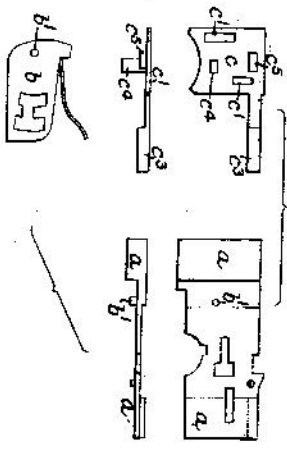


FIG. 6.

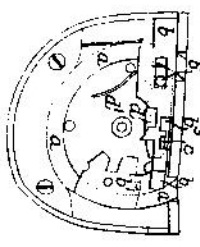


FIG. 17.

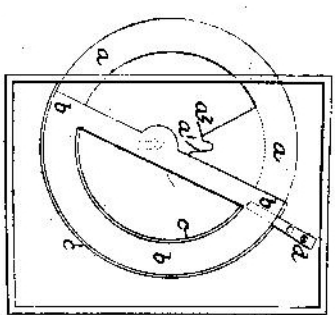


FIG. 15.

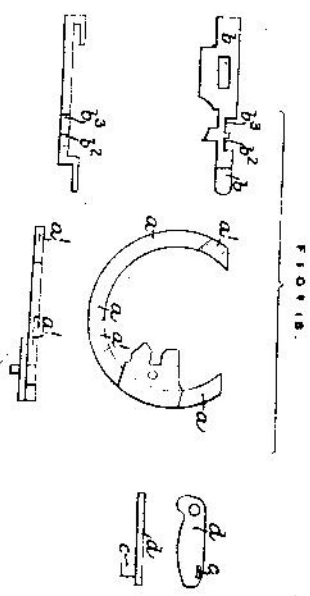


FIG. 13.

The filed drawing is not colored.

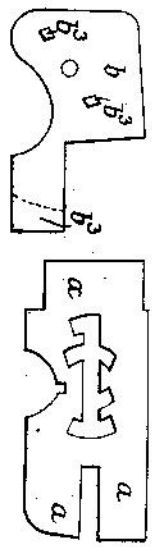


FIG. II.

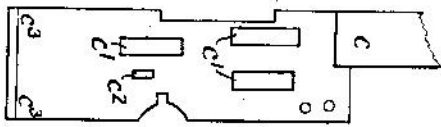
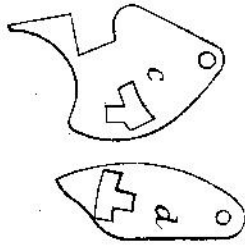
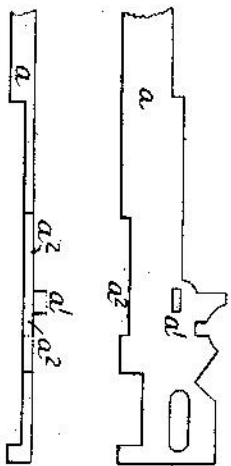
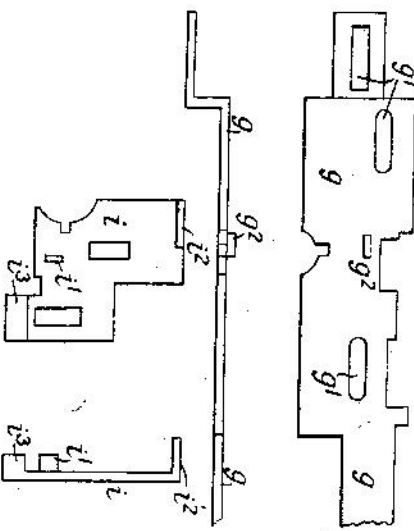
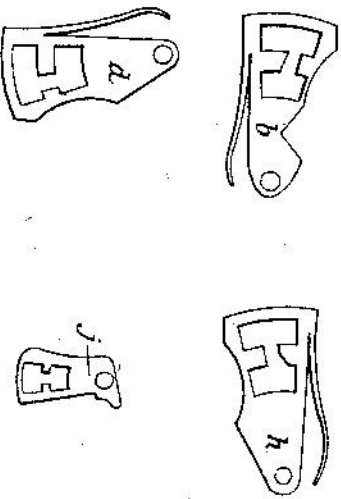
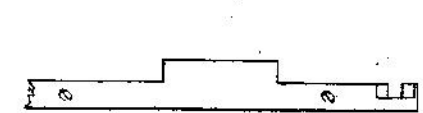
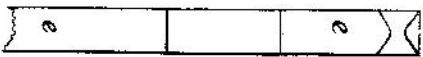
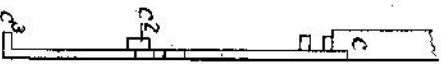


FIG. 3.



The thick drawing is uncoloured.

FIG. 19.

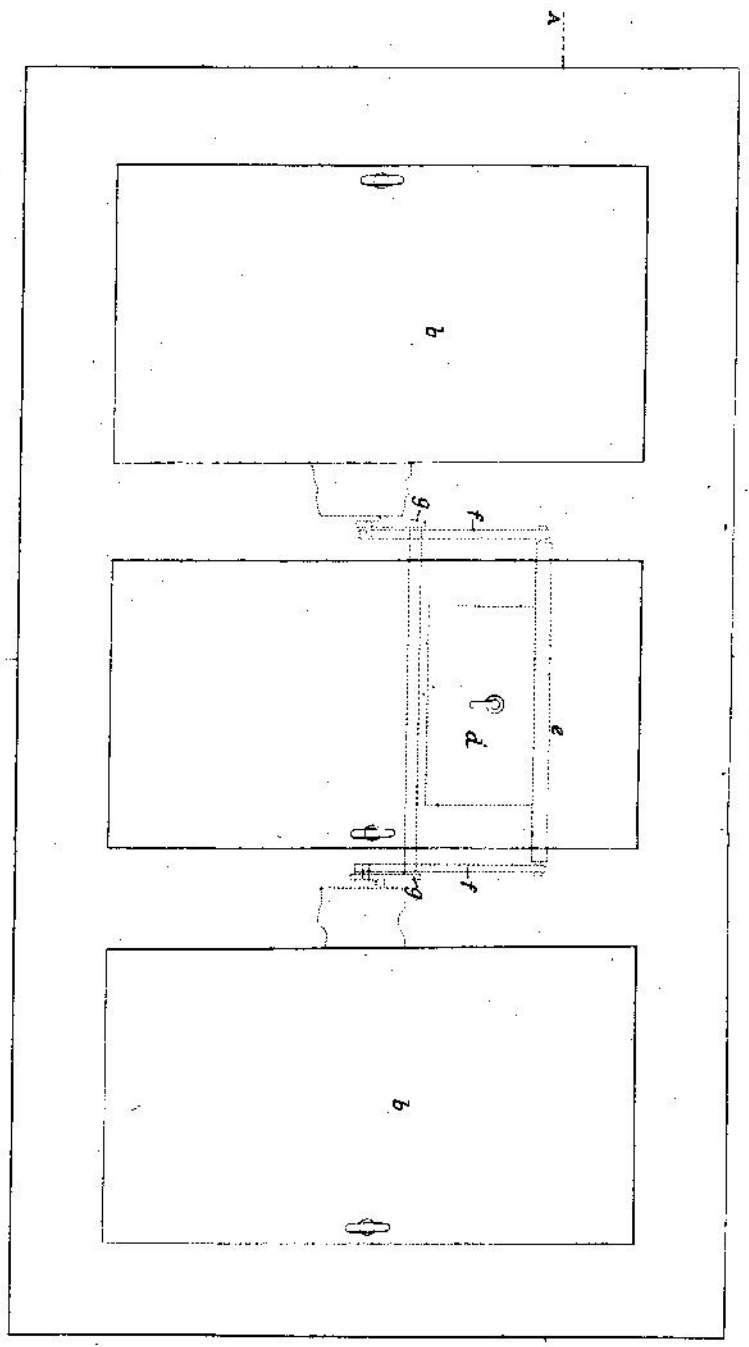


FIG. 21.

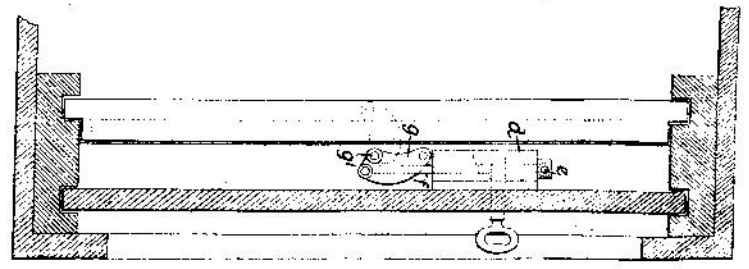
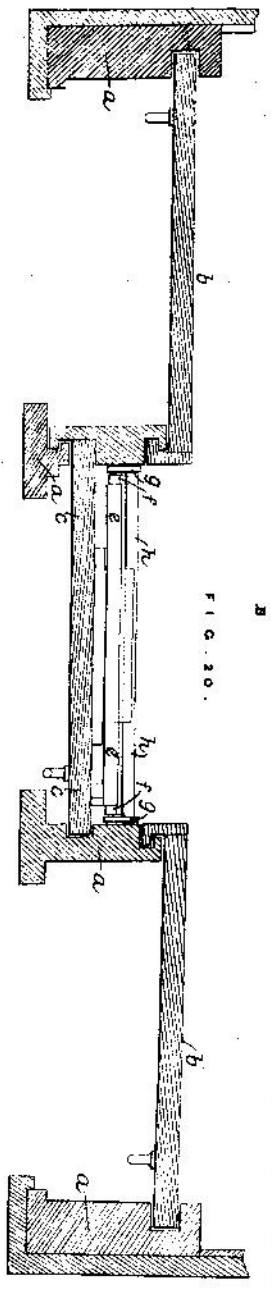


FIG. 20.



The fluid drawing is not colored.

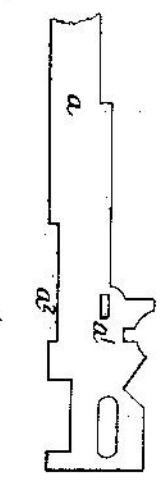
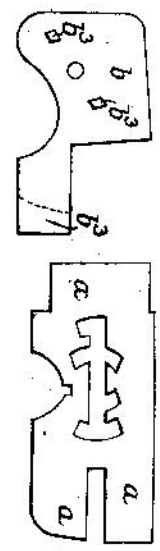


FIG. II.

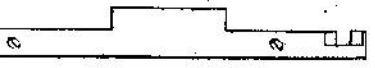
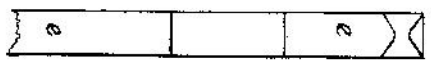
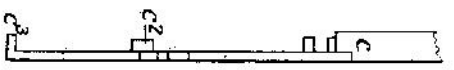
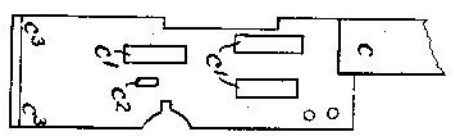
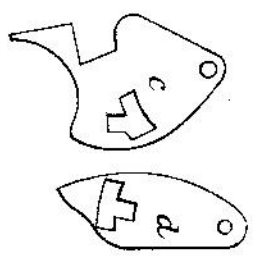
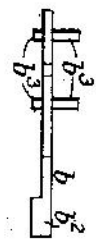
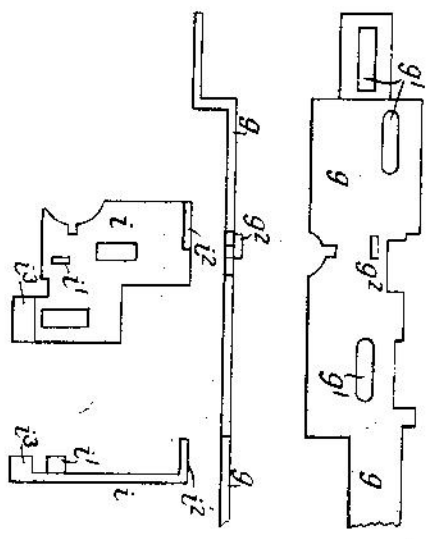
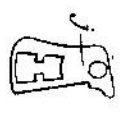
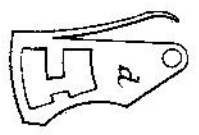
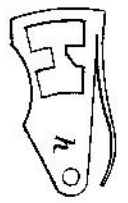
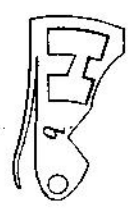


FIG. 3.



The third drawing is not colored.

FIG. 22.

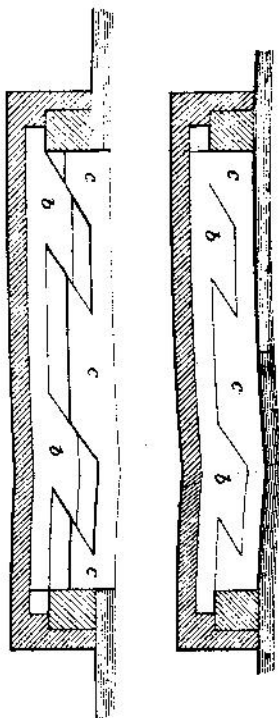


FIG. 23.

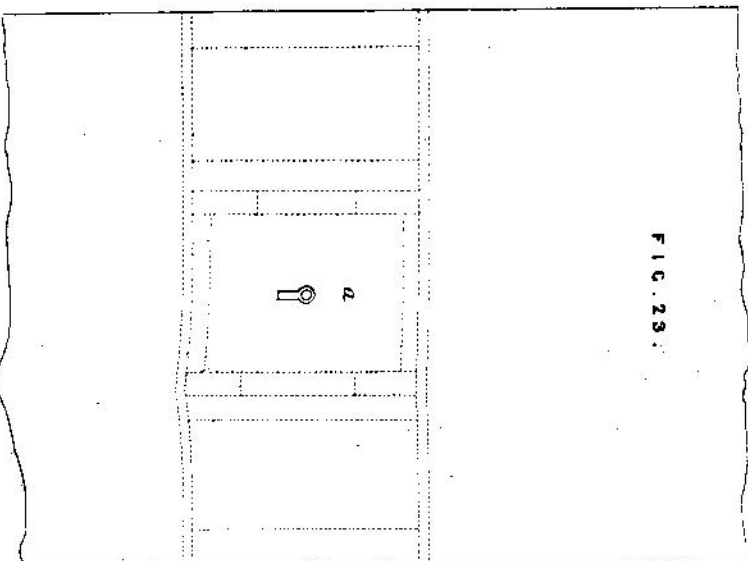


FIG. 12.

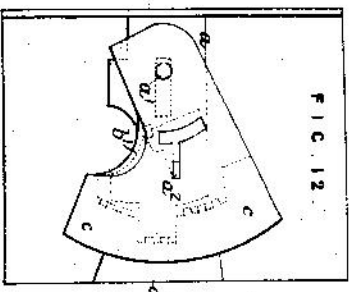
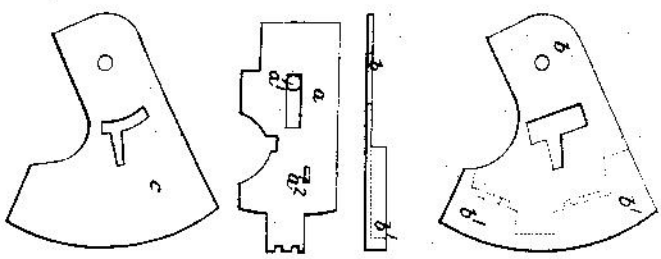


FIG. 13.



The steel drawing is not reduced.