A.D. 1846 . . . . . N° 11,152.

Doors, Windows, and their Fastenings.

COTTERILL'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, EDWIN COTTERILL, of Birmingham, in the County of Warwick, Manufacturer, send greeting.

WHEREAS Her present most Excellent Majesty Queen Victoria, by Her Royal Letters Patent under the Great Seal of Great Britain, bearing date at Westminster, the Twenty-fifth day of March, in the ninth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Edwin Cotterill, Her especial licence, full power, sole privilege and authority that I, the said Edwin Cotterill, my exors, admors, and assigns, or such others as I, the said Edwin Cotterill, my exors, admors, and assigns, should at any time agree with, and no others, from time to time and at all times during the term of years therein expressed, should and lawfully might make, use, exercise, and vend, within England, Wales, and the Town of Berwick-upon-Tweed, the Invention of "CERTAIN IMPROVEMENTS IN ARTICLES APPLIED TO WINDOWS, DOORS, AND SHUTTERS," part of which have been communicated to me by a certain foreigner residing abroad, and part invented by myself; in which said Letters Patent is contained a proviso, that I, the said Edwin Cotterill, shall cause a particular description of the nature of the said Invention, and in what manner the same is to be performed, to be inrolled in Her said Majesty's High Court of Chancery within six calendar months next and immediately after the date of the said in part recited Letters Patent, as in and by the same, reference being thereunto had, will more fully and at large appear.

NOW KNOW YE, that in compliance with the said proviso, I, the said Edwin Cotterill, do hereby declare that the nature of the said Invention, and the manner in which the same is to be performed, are fully described and ascertained in and by the following description thereof, reference being had to the Drawings hereunto annexed, and to the letters and figures marked thereon (that is to say) :—

The Invention consist, firstly, of an improved door lock; secondly, of improved door latches; thirdly, of improved door bolts; fourthly, of an improved axis for doors, or for windows opening in the manner of doors; fifthly, of an improved adjusting spindle for door knobs; sixthly, of improved door springs; seventhly, of an improved sash fastener; eighthly, of an improved rack pulley; ninthly, of an improved night bolt; tenthly, of an improved padlock; eleventhly, of an improved door knocker; twelfthly, of an improved door bell; and lastly, of an improved roller for roller blinds.

Figures 1, 2, 3, 4, 5, 6, and 7 represent one of my improved locks. Figure 1 represents a plan of the case and parts of the lock; Figure 2 represents a plan of the whole of the parts excepting the back plate of the lock, which is removed in order to exhibit the mechanism. Figure 3 represents a plan of the lock bolt; and Figure 4 represents a side view of the same. Figure 5 represents a plan of the latch bolt and its springs; and Figure 6 represents a side view of the latch bolt. Figure 7 represents the key. *a*, *b*, *c*, are spring tumblers, which resemble in their action those of ordinary locks; the projections a^1, b^1, c^1, of the said tumblers, when the several parts of the lock are in the positions represented in Figures 1 and 2, prevent the shooting of the lock bolt by being opposed to the projections *d*, *e*, of the said lock bolt (see Figures 3 and 4). The case of the lock is so formed, that when the lock bolt, Figures 3 and 4, is laid therein the sides of the said case form guides or supports in which the said bolt slides. By reference to Figure 2, in which the lock bolt, Figures 3 and 4, is represented by blue lines in its place in the lock, the manner in which it slides in the case *f* will be evident. *g*, *g*, is a groove formed in the middle and through the whole length of the lock bolt, Figures 3 and 4, in which groove the latch bolt, Figures 5 and 6, slides. The position of this bolt in the lock is represented by red lines in Figure 2. *m*, *m*, Figure 5, are helical springs, which throw out the latch bolt, Figures 5 and 6; *i* is a spring on the latch bolt, which when on the said bolt is withdrawn, slides in the small groove i^1 in the lock bolt, Figures 3 and 4, and when the said latch bolt is thrown out the said spring presses against the interior of the receiving box or box staple, into which both bolts enter. Since both the lock bolt and latch bolt shoot into the same receiving box or box staple, and since

the latch bolt slides within the lock bolt, the said latch bolt would not be in contact when shot out with the said box staple, by the thickness of that part of the lock bolt in which it slides (see the dotted line, Figure 4), it is therefore necessary to introduce the spring *i*, which by its elasticity gives as it were the requisite additional thickness to the latch bolt when shot out to bring it in contact with the said box staple *j*. Figures 1 and 2 is the spindle of the door knob; this spindle carries an arm or plate *k*, on which is fixed the roller l^1. When the latch bolt, Figures 5 and 6, is put in its place, it is supported and guided by the lock case and the lock bolt, (see Figure 2, in which the said latch bolt is represented in red lines.) *l*, *l*, Figures 5 and 6, are two projections on the under side of the latch bolt. When the door knob and spindle *j* are turned, the roller l^1 comes in contact with one of the projections *l*, *l*, and pressing against the said projection withdraws or forces the latch bolt back. When the hand is removed from the door knob the elasticity of the helical springs *m*, *m*, (which had been compressed when the bolt was withdrawn) again forces the said bolt, and roller l^1, and spindle *j* into the position shewn in the Drawing. The two projections *l*, *l*, being exactly alike, and similarly situated on opposite sides of the bolt, the said bolt is withdrawn whichever way the door knob or handle is turned. The helical springs *m*, *m*, bear against two projections on the lock plate or cover. The position of these projections when the lock plate is in its place is indicated at *n*, *n*, in Figure 2. When the key, Figure 7, is introduced into the lock and turned in the direction indicated by the arrow, Figure 1, the tumbler *a* is raised and the tumblers *b*, *c*, depressed, and the projections a^1, b^1, c^1, of the said tumblers, which, in the position represented in the Drawing, prevent the motion of the lock bolt, by being opposed to the sides d^1, e^1, of the projections *d*, *e*, are so far removed from the projections *d*, *e*, to which they were opposed, that they no longer prevent the motion of the bolt, and the key pressing against the projection *o* of the lock bolt shoots it forward. During the shooting forward of the bolt, the projection *d* of the bolt passes under the projection a^1 of the tumbler *a*, and the projection *e* of the bolt passes above the projections b^1, c^1, of the tumblers *b*, *c*. When the bolt has been shot forward the tumbler *a* descends and the tumblers *b*, *c*, ascend, and the projection a^1 of the tumbler *a* is opposed to the end d^{11} of the lock bolt, and the projections b^1, c^1, of the tumblers *b*, *c*, are opposed to the side e^{11} of the projection *e*, and the withdrawing of the bolt from the staple is prevented. When the key is turned in the direction opposite to that indicated by the arrow in Figure 1 the tumbler *a* is again raised and the tumblers *b*, *c*, depressed, and the key pressing against the projection o^1 of the bolt forces it back, or withdraws it from the staple *p*.

Figure 1 is a small bolt, which moves in a vertical direction, that is to say, in a direction at right angles to the direction of the motion of the lock and latch bolts. This bolt is connected with a knob on the outside of the lock case through a slot in the said lock case. When by pressing on the said knob the small bolt p is depressed, the projection p^1 on the said bolt is brought opposite the projection q of the latch bolt, Figures 5 and 6, and the said latch bolt is locked, that is to say, it cannot be withdrawn from its staple by a person external to the room on the door of which the lock is placed. By raising the knob of the bolt p, the latch bolt, Figures 5 and 6, is again unlocked.

Figure 8 represents one of my improved latches. a, a, is the plate of the latch; b, is the latch, which turns upon the axis c, fixed on the latch plate a; d is an axis, on each end of which a knob is affixed. The position of one of these knobs is indicated in the Drawing by a red line. The axis d carries two curved arms or levers e, e. f is a roller on the lever or latch b; g is a helical spring, partly contained in the case h. The said spring presses against the latch b, and tends to keep it in the position represented in the Drawing. When the knob of the axis d is turned in either direction, one of the curved arms or levers e, e, depresses the roller f, and with it the end of the latch to which it is affixed. The depression of that end of the latch occasions the elevation of the other end, and releases the latch from the catch in which it was previously engaged. The raising of the latch compresses the spring g, and when the hand is removed from the knob, the elastic force of the said spring depresses the end of the lever on which it operates, and brings the several parts into the positions represented in the Drawing. This latch may be locked or fastened, so that it cannot be raised by a person outside of the room to the door of which it is affixed, by the bolt represented at h. This bolt when moved horizontally to the left, by pressure of the finger upon the projection h^1, is brought under the end b^1 of the latch, and prevents the motion of the said latch.

Figure 9 represents, partly in horizontal section, one of my improved bolts, and Figure 10 represents, in plan, a portion of the same. It consists of a case a, in which the bolt b slides. c, c^1, are two slots in the case a. Through the slot c the knob d is connected with the bolt b. The use of the slot c^1 is hereinafter explained. e is a wedge attached to the end of a rod f. This rod slides in the tube g (passing through the knob h;) its motion is in a line at right angles to that of the bolt's motion. The end of the wedge e is introduced into a slot b^1 in the bolt b which slot is represented in the Drawing by dotted lines. The wedge e also passes through the slot c^1 in the case a. That end of the

slot b^1 against which the inclined surface of the wedge bears has the same inclination as the said inclined side of the wedge. By pressing on the knob h^1 the wedge e is pressed into the slot b^1 of the bolt b, and the inclined side of the wedge working against the inclined edge of the said slot b^1 causes the bolt b to move in a direction from left to right, and consequently to be withdrawn from the staple in which it was engaged. On ceasing to press the knob h^1 the elastic force of the spring i brings the several parts into the positions represented in the Drawing. This bolt may be locked or fastened so that it cannot be opened by a person outside of the room, to the door of which it is attached. The action of this part of my improved bolt will be best understood by reference to the plan. Figure 10, b represents the end of the bolt, and a the case of the said bolt; m represents a small bolt, which is connected with the stud j on the outside of the case through the slot k. The small bolt has motion in a direction at right angles to the direction of the motion of the large bolt b; l is a recess in the large bolt b, into which, when the said bolt is withdrawn from its staple in the manner herein-before explained, the projecting part m^1 of the small bolt m enters, and the said end of the small bolt offers no obstruction to the motion of the large one. When the stud j is pressed so as to bring the projecting end m^1 of the small bolt m opposite that part of the large bolt b marked b^1, the said large bolt b can no longer be moved.

Figure 11 represents one of my improved lift latches, which is suitable for doors opening either on the right or on the left. a, a, represents a continuous metallic plate, to which the latch b is jointed, and to which the guide c of the latch is also attached. The middle part of the plate a, which connects the ends of the said plate together, is so narrow (as seen by the dotted lines representing its breadth) that it does not interfere with the action of the thumb lifter (such as is represented in Figure 16), which is used to lift the latch b, the said latch being broader than the middle part of the plate a. c is a screw on which the latch b rests, and b^1 is a hole in which the screw c is put when it is intended to use the latch b on a door which opens on the right. The latch in Figure 11 is represented in the position which it occupies on a door opening on the left, in which position the screw c is required to arrest the latch when it has so far descended as to have acquired a horizontal position. When the latch, Figure 11, is turned round, so as to assume the position it would have on a door opening on the right, the latch would be altogether inverted, and the screw c in the inverted position of the latch would prevent the latch b from raising above a horizontal position. The screw c is therefore, in the case supposed, removed from the hole in which it is screwed,

as represented in the Drawing, and introduced into the hole b^1, which is now below the latch, and the said screw again forms a support for the latch. The figure of the latch being the same both on its upper and lower edges, the moving of the screw is the only change necessary to adjust the latch either to a right or left handed door. A small bolt *d*, by being pushed into the recess d^1 in the guide *c*, bolts the latch.

Figure 12 represents another of my improved lift latches, the back of the case being removed in order to shew the interior of the same. *a* is a latch of the form shewn in the Drawing; this latch turns upon the axis *b*. *c* is the axis to which the knob used in lifting the latch is attached; *d* is a plate affixed to the said axis *c*; *e* is a stud or pin on the plate *d*, which stud or pin, when the latch is in the position shewn in the Drawing, is opposed to a projection *f* on the under side of the latch *a*; *g* is a small lever turning on an axis affixed to the lock case; one end of this lever bears against a pin or stud *h* on the under surface of the latch *a*, and the other end, when the several parts of the latch are in the position shewn in the Drawing, bears against the stud or pin *e* on the plate *d*. When the knob of the axis *c* is turned in the direction indicated by the arrow, the stud *e* presses against the projection *f* on the latch *a* and raises the said latch; and if the said knob is turned in the direction opposite to that indicated by the arrow in the Drawing, the stud *e* raises that end of the small lever *g*, against which it presses and depresses the other end of the said lever; the depressed end of the said lever bearing against the stud *h* of the latch depresses the same and thereby raises the latch, that is to say, whichever way the knob of the latch is turned the said latch is raised. When the hand is removed from the knob, the spring *i* brings the latch back into the position shown in the Drawing. *j* is a stop to limit the motion of the latch; *k* is a small bolt, which may be moved horizontally by a stud on the outside of the case. When pushed to the left, the said bolt enters a recess in the latch, and thereby prevents the motion of the latch; when by moving the bolt to the right the said bolt is withdrawn from the recess in question, it no longer interferes with the motion of the said latch. This method of locking or preventing the motion of the said latch so nearly resembles the methods herein-before described with reference to the lock, Figures 1 and 2, and the latches, Figures 8, 9, 10, and 11, that I deem a more particular description unnecessary.

Figure 13 represents a view of the end of the latches *a*, *a*, Figures 12 and 14, and of the staple in which the said latches engage.

Figure 14 represents a modification of the latch last described. *a* is the latch connected with the circular plate *b*; the said latch and plate are repre-

sented in the Drawing in red lines. *c* is a projection on the under side of the plate *b*; and *d* is a pin or stud, also on the under side of the said plate *b*; *e* is the axis to which the door knob is attached; this axis carries two arms or levers *f*, f^1. *g* is a lever turning on an axis affixed to the latch case; one end of this lever bears against the projection *c* of the plate *b*; the other end of the said lever is immediately under the arm or lever *f* of the axis of the door knob, The arm or lever f^1 of the said axis bears against the projection *d* of the plate *b*. When the door knob and axis *e* are turned in the direction indicated by the arrow in the Drawing, the arm f^1 of the said axis *e* depresses the pin or stud *d*, and thereby produces the partial rotation of the plate *b* and raises the latch *a*. When the hand is removed from the door knob the spring *h* brings the several parts into the position in which they are represented in the Drawing. If the door knob and axis *e* are turned in a direction opposite to that indicated by the arrow in the Drawing, the arm or lever *f* depresses that end of the lever *g* with which it is in contact, and consequently raises the other end of the said lever; the raised end of the said lever *g* bearing against the projection *c*, produces a partial rotation of the plate *b*, and thereby raises the latch *a*; the latch *a* may be bolted by a small bolt at a^1. As the action of this bolt exactly resembles that of several bolts herein-before particularly described I do not deem a description of it necessary.

Figure 15 represents another of my improved door latches. *a*, *a*, is the case of the latch, the form of which is such that it constitutes a guide or support in which the bolt *b* slides; *c* is the axis to which the door knob is attached; *d* is a plate attached to the axis *c*; this plate carries an axis *e*, on which the roller *f* works. *g*, g^1, are projections on the under side of the bolt *b*; if the door knob is turned in the direction indicated by the arrow in the Drawing, the roller *f* presses against the projection *g* and forces back the bolt *b*; if the door knob is turned in the direction contrary to that indicated by the arrow in the Drawing, the roller *f* presses against the projection g^1 and forces back the bolt *b*, that is to say, whichever way the door knob is turned the bolt *b* is forced back or withdrawn from its staple. When the hand is removed from the door knob the helical spring *h* (shown in dotted lines) brings the several parts into the positions shown in the Drawing. The spring *h* bears against a projection on the top plate of the case; the position of this projection is indicated in dotted lines at *i*. The end b^1 of the bolt *b* is inclined, as seen in the Drawing.

Figure 16 represents my improved thumb latch, to be used either in connection with the ordinary latch, or with the latch represented in Figure 11. This thumb latch differs from the ordinary thumb latch only in respect of the position of the thumb plate *a*, which in the ordinary thumb latch is situated in

the same line as the arm or lever *b*, or very nearly so. In my improved thumb latch the thumb plate *a* is situated in a line at right angles to that of the arm or lever *b*, as represented in the Drawing.

Figure 17 represents an instrument or apparatus to be attached to doors or to windows opening in the manner of doors, that is to say, turning on a vertical axis. *a* is a case to be let into the floor of the room or the bottom of the window frame; *b* is a bolt, sliding in the case *a*, and carrying at one end the roller *c*; this bolt is urged forward by the helical spring *d*. *e* is the axis of the door or window, on the lower end of which axis the indented wheel *f* is fixed. When the axis is turned, by the opening of the door or window, the roller *c* is pressed into the indentations on the wheel *f*, and if the said window or door be left open at any angle at which the roller *c* is situated in one of the said indentations, the said window or door will be retained in that position with a force dependant on the strength of the spring *d*.

Figure 18 represents my improved adjusting spindle for door locks and latches, that is to say, a spindle which can be lengthened or shortened, so as to suit doors of different thicknesses. *a* represents the square spindle, which has a cylindrical opening through the whole or part of its length. This cylindrical opening is furnished with a concave thread, which corresponds to the convex thread on the screw *b*. The square spindle *a* passes through a square opening in the neck of the knob *c* into the interior of the said knob; by turning the screw *b*, it may be made to enter a greater or less distance into the spindle *a*, and carrying with it the knob *c*, that part of the said spindle *a* which is external to the said knob is lengthened or shortened.

Figure 19 represents one of my improved arm springs for doors. In the arm spring, as commonly made, the spring, by the elasticity of which the arm is made to close the door, is connected at one end with an axis attached to the door frame, and at the other directly with the said arm. In my improved arm spring the coiled spring is connected at one end with an axis (shewn in the Drawing in dotted lines), and the said axis is affixed to arms on the plate *a*, which said plate is attached to the door frame. The other end of the said spring is connected with a spring box *b*, and the arm *c* is attached to the said spring box.

Figure 19, A, represents a side view of the incline *d*, Figure 19, on which incline the roller *e*, Figure 19, rolls. When the door is closed the roller *e* rests in the depression on the top of the inclined plane. Instead of affixing a roller at the end of the arm in my improved arm spring, and causing the said roller to roll on a plane inclined or otherwise, as herein-before described, I sometimes connect the end of the said arm directly to the door, as represented in Figure 20, in which Figure *a* represents the arm; *b*, the joint

which connects the said arm *a* with the plate *c*, which said plate is fixed on the door. When the end of the arm is thus fixed to the door it is necessary to construct the said arm in such a manner that it may lengthen or shorten. The construction by which this may be effected is represented at *d*, *e*. *d* is a tube into which the arm *a* enters, and by sliding in which the said arm is virtually lengthened or shortened; *e* is a helical spring, which is placed on the tube *d*, and which presses against the bottom of the said tube and the end of the arm *a*.

Figure 21 represents my improved door bolt. This door bolt fastens the door, to which it is attached in two places, that is to say, there are two bolts moving in lines at right angles to one another, and both bolts are shot out at the same time. *a* and *b* are the bolts, sliding in grooves or guides formed by the case *c*; *d* is an axis, to which the knob or handle for bolting the door is attached; e, e^1, are two cranks affixed to the said axis *d*; f, f^1, are links connecting the bolts *a*, *b*, with the cranks e, e^1. When the knob or handle affixed to the axis *d* is turned in the direction indicated by the arrow in the Figure the motion of the cranks e, e^1, and connecting links f, f^1, withdraws the bolts *a*, *b*, from their staples. On turning the knob or handle in the direction contrary to that indicated by the arrow in the Figure the bolts *a* and *b* will be again shot out into the position represented in the Drawing. The bolt *a* shoots into a staple in the door case, and the bolt *b* shoots into a staple in the floor; the bolt *b* may, however, be placed on the upper side of the case and may be made to shoot upwards, in which case it will shoot into a staple in the top of the door case.

Figure 22 represents a plan, and Figure 23 an elevation, of an improved door spring. *a* is an arm or lever, attached by a joint *b* to the case *c*; the said case is let into the floor of the room, to the door of which the spring is attached. The end of the lever *a* has a semicircular form, as shewn in Figure 22, and each end of the arms or branches a^1, a^{11}, forming the semicircle, is inclined, as represented in Figure 23. *d* is the axis of the door; *e* is an arm or lever, attached to the lower end of the said axis; *f* is a roller working on the semicircular end of the arm or lever *a*; *g* is a helical spring, which presses the arm or lever *a* upwards. The inclined and curved arms a^1, a^{11}, on which the roller *f* works being pressed upwards against the said roller, the several parts can only be in equilibrium when the roller *f* is at the bottom of the said inclines a^1, a^{11}, that is to say, when it is upon that part of the arm or lever *a* marked *h*.

When the door is opened in either direction the roller *f* in rolling on the inclined surfaces of a^1, a^{11}, and by depressing the same, compresses the spring *g*, the reaction of the said spring pressing the incline a^1 or a^{11} against the said

roller tends to bring it again to the part marked *h*, and consequently to close the door working on the axis *d*.

Figure 24 represents my improved sash fastener. *a* is an arm or lever, turning upon a joint or axis *b*, this axis is supported on one of the window sashes *c* by the support *d*. *e* is a roller supported by a frame *f* on the other window sash *g*. The several parts of the window fastener are represented in the Drawing in the positions which they occupy when the window is fastened. When the window is unfastened the lever *a* is in a vertical position, the curved end a^1 being held by the curved spring *h*. When the lever *a* is in a vertical position the sash *c* may ascend or the sash *g* may descend. When the sashes are in the position shewn in the Drawing, that is to say, when the window is closed, the lever *a* may be brought from its vertical position into the position shewn in the Drawing, in which position the hooked or carved end a^1, by bearing against the roller *e*, prevents the opening of the window. The lever *a* is held in its position by the arm *i*, the end of which, when the lever is in a horizontal position, falls into a notch in the said lever and prevents its motion. In order to raise the lever *a* into a vertical position and thereby unfasten the window, it is necessary to raise the arm *i* out of the notch in the lever *a*. This may be done by raising the rod *j* attached to the arm *i*. The said arm *i* may be raised and the lever *a* lifted into a vertical position by grasping at the same time between the forefinger and thumb the end of the lever *a* and the end of the rod *j*.

Figure 25 represents my improved rack pully for window blinds. *a* is a metal plate to be attached to the window frame; *b* is a rack attached to the back of the plate *a*; *c* is the pully over which the blind cord passes. This pully is attached to a metal plate *d*, the edges of which are bent so as to clip the edges of the plate *a*, the plate *d* thereby slides on the plate *a*. *e* is a spring attached to the back of the plate *d*, and which passes through a slot made in the whole length of the rack *b*. The broad end of the spring *e* engages in the teeth of the rack *b*. *f* is a knob which is connected with the spring *e*; by pressing this knob the spring *e* can be disengaged from the rack *b*. In order to tighten the blind cord it is only necessary to depress the knob c^1, which will cause the pully *c* and plate *d* to descend; the spring *e* prevents the return of the plate *d*. In order to raise the said plate *d* it is only necessary to press the knob *f*, when the spring *e* will be disengaged from the rack *b*, and the pully *c* and plate *d* may be raised.

Figure 26 represents an improved door spring to be used in place of the common arm spring. *a* is a hollow cylinder which slides on the plate *b*; the said plate *b* is attached to the door. A helical spring is contained partly in the

cylinder *a* and partly in the hollow piston *c*. *d* is a connecting link, serving to connect the piston *c* with the knuckle *e* attached to that side of the door hinge *f* which is fixed to the door case. The force of the spring in the cylinder *a* and piston *c* is determined by causing the cylinder *a* to slide to a greater or less distance from the door hinge *f*, and thereby compressing the said spring to a greater or less degree. The screw *g* serves to adjust the position of the cylinder *a*. *h* is a guide in which the cylinder *a* slides. When the door is opened the piston *c* is forced in the cylinder *a*, and the spring contained therein is compressed, and by its reaction tends to close the door.

Figure 27 represents another of my improved door springs to be used in place of the common arm spring. *a* is a cylinder which is let into the door frame in a horizontal position; this cylinder contains a spring, and is furnished with a hollow piston a^1, as in the door spring last described. *b* is a lever jointed at *c* to the cylinder *a*; *d*, d^1, are rollers on the ends of the lever *b*; the roller *d* bears against the door, and the roller d^1 bears against the hollow piston a^1. When the door is opened the long arm of the lever *b* moves in the direction indicated by the arrow in the Drawing, and the short arm of the said lever presses the hollow piston a^1 into the cylinder *a* and compresses the spring contained therein. The spring by its reaction tendes to bring the lever *b* into the position shewn in the Drawing, that is to say, to close the door.

Figure 28 represents my improved night bolt. *a* is a spring bolt fixed on the door on the inside of the room; this bolt, instead of shooting into an ordinary staple, shoots on the closing of the door behind the vertical bolt *b*, the inclined end of the bolt *a* sliding over the inclined side of the bolt *b*. The position of the bolts represented in the Drawing is that which they occupy when the door is closed. It will be seen by reference to the Drawing that the bolt *a* cannot shoot so far forward as to bring its end in contact with the side of the case *c*, (the end of the bolt is represented in dotted lines) so long as the bolt *b* is in the position represented in the Drawing. The cord *d* passes to the bedside or to some distant part of the room, and when by pulling the said cord the bolt *b* is raised, the bolt *a* shoots forward until its end (shown in dotted lines) comes in contact with the side of the case *c*. The door may now be opened, for there is nothing opposed to the passage of the bolt *a* out of the case *c*. After the bolt *b* has been raised and the bolt *a* shot into the position last described, it is no longer necessary to hold the cord *d*, for the projecting part a^1 of the bolt *a* has passed under the lower end of the bolt *b*, and prevents its descent. When the door is opened the bolt *a* in passing out of the case *c* allows the bolt *b* to descend, and when the door is closed again the inclined edge of the bolt *a* passes over the inclined side of the

bolt *b*, and shooting behind the said bolt *b*, the several parts again assume the position shewn in the Drawing.

Figure 29 represents, in plan, a door spring which may be easily connected with or detached from the door at pleasure. It consists of a spring coiled in a spring box, which spring and spring box are let into the upper part of the door frame, a cord or tape wound round; the said spring box is connected with the top of the door, and when the door is opened the said tape by uncoiling itself from the spring box winds up the spring in the interior thereof, and when the door is let at liberty the reaction of the said spring again coils up the tape on the spring box and closes the door. *a* represents a fixed axis, to which one end of the coiled spring is attached; the other end of the said spring is connected with the spring box *b*, the interior upper edge of which is furnished with the teeth *c*, *c*. *d* is a pinion fixed on the support *e*; *f* indicates in dotted lines the outer case on which the tape is coiled; the toothed wheel *g* is fixed on the under side of the top of the said case *f*; the pinion *d* engages both with the wheel *g* and the teeth *c*, *c*. By the opening of the door and the uncoiling of the tape from the outer case *f*, the said case is made to rotate, and its motion is communicated through the pinion *d* to the spring box *b*; the spring in the said spring box becomes thereby coiled up, and by its reaction tends to close the door. A metal loop *h* at the end of the tape or cord may be attached to the door or detached from it at pleasure by being placed on the pin *i* on the top of the door or removed therefrom.

Figures 30, 31, 32, 33, 34, 35, and 36 represent my improved padlock. Figure 30 represents a plan, and Figure 31 a vertical section of the principal parts of the same. *a*, Figure 30, represents a circular bed, having a circular groove *b* formed thereon; the said circular groove, it will be observed in the Drawing, is not continuous, being interrupted by the small radial bars *c*, *c*, *c*; it will further be observed that the said bars *c*, *c*, *c*, are each furnished with a transverse groove or slit, and that if each of the said bars were pushed to a particular distance from the centre of the bed *a*, the grooves or slits in the said bars may be made to correspond with the circular groove *b* in the bed *a*, and that in that case the said circular groove would be continuous. *d*, Figure 31, is a circular plate which turns on the axis *e*. This plate has a projection or rim *f*, which exactly corresponds with, and when the said plate *d* is pushed down on the axis *e* enters into the groove in the bed *a*. The circular projection or rim *f* is, however, not continuous, but is cut away or interrupted, as shewn in the plan, Figure 32. Were it not for the interruptions in the said projection or rim *f* it could only enter the groove in the bed *a* when the bars *c*, *c*, were pushed out, so as to make the said groove continuous, but being

cut away in places which correspond to the bars *c*, *c*, the plate *d* can be pushed down the axis *e*, and the projection or rim *f* enter the groove *b* when the bars are in the position shown in Figure 30, but the said plate *d* cannot turn round until the bars *c*, *c*, are pushed out, in the manner herein-before described. When the key, Figure 36, is placed upon the axis *e* and pushed down thereon, the inclined edges c^1 of the bars *c* enter the depressions *x* in the said key, and the said depressions are of such different depths, that when the key is pushed as far as it can be on the axis *e*, the bars *c*, *c*, are severally pushed out to the distance necessary to bring their grooves in connection with the groove on the bed *a*, and make the said groove continuous; on turning round the key, Figure 36, the whole of the parts shown in Figures 30 and 31 excepting the plate *d*, Figure 31, may be turned round, when the key is withdrawn from the axis *e*, the bed *a* and plate *d* are so situated with regard to each other, that the interruptions in the rim or projection *f* are directly over the bars *c*, *c*, and the said bars are immediately forced inwards into the positions represented in Figure 30 by the helical springs *g*, *g*; the groove *b* being no longer continuous, the bed *a* and plate *d* are locked together, that is to say, one cannot rotate without the other. The whole of the mechanism, Figures 30 and 31, is introduced into a case, of which the front is represented in Figure 33. The back of the said case is a flat plate screwed thereon; the three pins *h*, *h*, *h*, of the plate *d* (see also Figure 32) pass into the three holes *i*, *i*, *i*, in the case, Figure 33, and hold the said plate while the bed *a* with the bars *c*, *c*, *c*, and springs *g* can turn, when the key is introduced on the axis *e*, through the keyhole *j*. *k*, Figures 31 and 35 is a rim on the bottom of the bed *a*; this rim is not continuous, but is cut away at the part marked *l*. *m*, Figure 35, is the shackle of the lock (shewn also separately in Figure 34), which slides in the neck of the case.

Figure 33, *n* is a projection on the said shackle, which when the lock is locked is within the rim *k* of the bed *a*, but which when the key is introduced and the bed *a* turned so as to bring the opening *l* opposite the said projection may pass out of the said rim, and the shackle will consequently slide in the neck of the case, Figures 33 and 35. The staple or other fastening which has been introduced into the hollow n^1 of the shackle *m* may now be withdrawn. The shackle *m* is prevented from being withdrawn altogether from the lock by two studs *o*, *o*, which being fixed on the shackle at a distance from each other greater than the width of the opening *l* of the rim *k*, cannot pass out of that opening.

Figure 37 represents my improved door knocker, by which a person on the outside of a building or apartment may work a knocker situated in the inside of the same. *a* is an axis passing through the door *b*; *c* is a wheel placed on the axis *a* on the outside of the door; *d* is a knob or handle by which the

wheel *c* and axis *a* may be turned; *e* is a wheel on that end of the axis *a* which is situated in the interior of the hall or apartment to which the door belongs; this wheel has two teeth or inclines, as shewn in the Drawing. *f* is the knocker, jointed to the door at f^1, a projection *g* on the under side of the same rests against the inclines or teeth of the wheel *e*. When the wheel *c* is turned by a person outside of the building or apartment, the inclines or teeth of the wheel *e* are brought under the projection *g* of the knocker *f*, and raise the said knocker into the position shewn in the Drawing; as the said teeth or projections pass from under the projection *g*, the knocker *f* is pressed forcibly against the knob *h* by the spring *i*, and a loud noise is produced. It is evident that the knocker *f* will strike the knob *h* twice during each revolution of the wheel *c*.

Figure 38 represents my improved door bell, by which a person situated on the outside of a building or apartment may ring a bell in the interior of the same. The parts situated on the outside of the door exactly resemble those of my improved door knocker as seen in the Drawing. A pinion *b* on that end of the axis *a* situated on the interior side of the door engages in a wheel *c*. *d*, *d*, are a series of inclined teeth on the wheel *c*; *e* is a lever turning on an axis e^1; one end of this lever carries the hammer *f*; as the teeth *d*, *d*, pass under the short arm of the lever *e*, they bring the said lever into a nearly vertical position, and thereby remove the hammer *f* to a distance from the bell *g*. As the inclines *d* pass from under the end of the lever *e*, a spring in the box e^{11} brings the lever *e* into the position shewn in the Drawing, in taking which position the hammer *f* strikes the bell *g*. The said hammer strikes the said bell three times during each revolution of the wheel outside the door.

Figure 39 represents my improved roller for roller blinds. *a* is a rod which slides in the tube *b* so as to shorten or lengthen the blind roller, of which the said rod and tube form a part. The position of the rod *a* in the tube *b* may be fixed by the screw nut *c*; *d*, d^1, d^2, are three cylindrical blocks to which the blind is attached; *e*, *f*, are brackets which support the blind roller; *g* is a cone in the interior of the block *d*, which cone is pressed into the conical cavity in the said block by the spring e^1; the square end of the cone *g* is inserted in a square hole in the bracket *e*; the cone *g* consequently cannot turn, and the friction between it and the conical cavity in the block *d* causes the said block and the other parts of the roller to turn stiffly, and thereby prevent the running down of the blind by its own weight. That end of the roller which is supported in the bracket *f* is cylindrical, and consequently turns in the said bracket. The roller is turned for the purpose of raising and lowering the blind in the following manner:—One end of a blind cord is coiled around the receiving

box *h*, and the other end of the same cord is coiled in the opposite direction around the receiving box *i*, the middle portion of the said cord hanging down in a loop of a depth convenient to be taken hold of. By pulling one side of the said loop the blind may be wound up, and by pulling the other side of the said loop the blind may be pulled down.

Having now described the nature of my said Invention, and the manner in which the same is to be performed, I wish it to be understood that I do not limit myself to the precise methods of carrying out my Invention herein-before described, as the same may be varied without departing from the nature of my said Invention; but I claim,—

Firstly, the general arrangement of the parts of a lock in which the latch bolt of the said lock slides within the lock bolt of the same, herein-before described, and illustrated in Figures 1, 2, 3, 4, 5, 6, and 7, of the accompanying Drawings.

Secondly, the arrangement of those parts of a lock by which the withdrawing of the latch bolt is effected, herein-before described, and represented in Figures 1, 2, 5, and 6 of the accompanying Drawings; also the application of the same to a chamber latch or lock, as herein-before described, and represented in Figure 15 of the accompanying Drawings.

Thirdly, the construction of a plate latch in which curved arms or levers attached to the axis of the door knobs raise the said latch by the turning of the said knobs; also the use of a helical or coiled spring in the construction of plate latches, as herein-before described, and represented in Figure 8 of the accompanying Drawings.

Fourthly, the construction of bolts withdrawn from their staples by the action of a wedge moving in a line at right angles to the motion of the said bolts, as herein-before described and represented in Figures 9 and 10 of the accompanying Drawings.

Fifthly, the construction of a lift latch and the method of adapting the same to doors, opening either on the right or left, as herein-before described, and represented in Figure 11 of the accompanying Drawings.

Sixthly, the construction of a thumb lifter to be used with lift latches, in which the thumb plate of the said lifter is situated at right angles to the lever of the same, as herein-before described, and represented in Figure 16 of the accompanying Drawings.

Seventhly, the construction of lift latches, in which the motion of the door knob and axis, when the said knob and axis are turned in one direction, is communicated directly to the said latch, and when the said knob and axis are turned in an opposite direction the said motion is communicated to the said

latch through a small lever, so as to reverse the direction of the same, that is to say, to produce the lifting of the latch in whichever way the said knob and axis are turned; also the form of the end of the latch and receiving box for the same, herein-before described, and represented in Figures 12, 13, and 14 of the accompanying Drawings.

Eighthly, the construction of an axis for doors, or for windows opening in the manner of doors, in which a bolt pressed by a spring into indentations on the periphery of a wheel on the said axis holds the said doors or windows open at any desired angle, as herein-before described, and represented in Figure 17 of the accompanying Drawings.

Ninthly, the construction of an adjusting door spindle, by introducing a screw into the said hollow and square spindle, the said screw as it advances or recedes in the said spindle carrying with it the said knob, and thereby vertually lengthening or shortening the said spindle, as herein-before described, and represented in Figure 18 of the accompanying Drawings.

Tenthly, the construction of arm springs for closing doors, by attaching the arm of the same to a spring box instead of directly to the spring, the said spring box being connected with the said spring; also the inclined plane and indentation on the door on which the roller of the said arm rolls and rests; also the attaching of the arm directly to the door and the introduction of a telescope slide with a spring therein into the said arm, as herein-before described, and represented in Figures 19, 19 A, and 20 of the accompanying Drawings.

Eleventhly, the particular arrangement of the parts of a double-acting door spring, herein-before described, and represented in Figures 22 and 23 of the accompanying Drawings.

Twelfthly, the methods of constructing door springs, herein-before described, and represented in Figures 26 and 27 of the accompanying Drawings.

Thirteenthly, the method of constructing sash fasteners, herein-before described, and represented in Figure 24 of the accompanying Drawings.

Fourteenthly, the construction of rack pullies for window blinds, in which the rack is situated on the back of the frame of the said rack pulley, and the method of releasing the spring from the same, herein-before described, and represented in Figure 25 of the accompanying Drawings.

Fifteenthly, the general arrangement of the parts of a door bolt, by which two bolts are simultaneously shot out in directions at right angles to each other, herein-before described, and represented in Figure 21 of the accompanying Drawings.

Sixteenthly, the method of constructing and applying a door spring to a

door, herein-before described, and represented in Figure 29 of the accompanying Drawings.

Seventeenthly, the construction of a padlock, in which the mechanism for locking the same consists of a rim or circle in one part thereof, turning in a groove in another part thereof, the said rim or circle being interrupted or cut away in certain places, and the said groove, in which the said rim or circle turns, being also interrupted by a series of bars moving radially, notches or indentations being cut in the said bars, which, when the key is introduced, are made to coincide with and make continuous the said groove, and thereby allow of the rotation of the said rim or circle, as herein-before described, and represented in Figs. 30, 31, 32, 33, 34, 35, and 36, of the accompanying Drawings, and the application of the same principle of construction to every kind of lock.

Eighteenthly, the attaching of knockers and bells to the inside of doors, the said knockers being knocked, and the said bells being rung by parts or mechanism on the outside of the said doors, as herein-before described, and represented in Figures 37 and 38 of the accompanying Drawings.

Nineteenthly, the construction of a roller for roller blinds, which may be lengthened or shortened by one part of the same sliding in the other; also the use of a double receiving box for winding and unwinding the cord by which the blind is raised and lowered, as herein-before described, and represented in Figure 39 of the accompanying Drawing.

In witness whereof, I, the said Edwin Cotterill, have hereunto set my hand and seal, this Twenty-third day of September, in the year of our Lord One thousand eight hundred and forty-six.

EDWIN (L.S.) COTTERILL.

AND BE IT REMEMBERED, that on the Twenty-third day of September, in the year of our Lord 1846, the aforesaid Edwin Cotterill came before our said Lady the Queen in Her Chancery, and acknowledged the Specification aforesaid, and all and every thing therein contained and specified, in form above written. And also the Specification aforesaid was stamped according to the tenor of the Statute made for that purpose.

Enrolled the Twenty-fifth day of September, in the year of our Lord One thousand eight hundred and forty-six.

MORGAN, Extrn.

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Printers to the Queen's most Excellent Majesty. 1857.

A.D. 1846. March. 25. Nº 11,152.
COTTERILL'S SPECIFICATION.

FIG. 1.

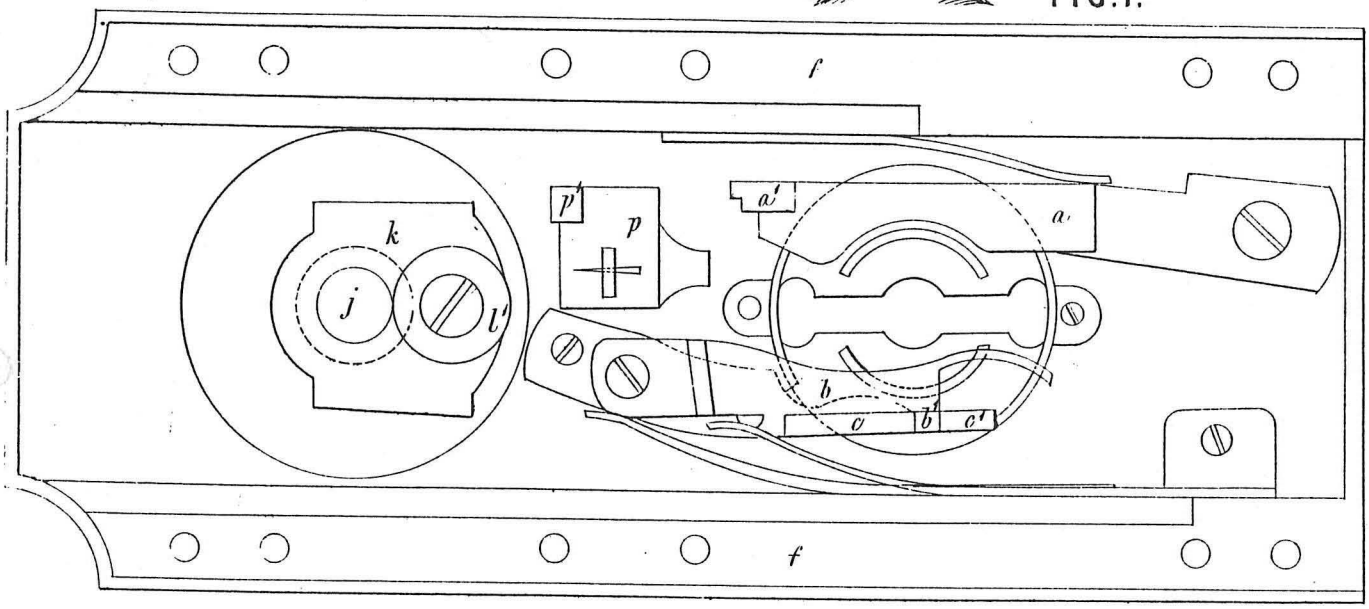


FIG. 2.

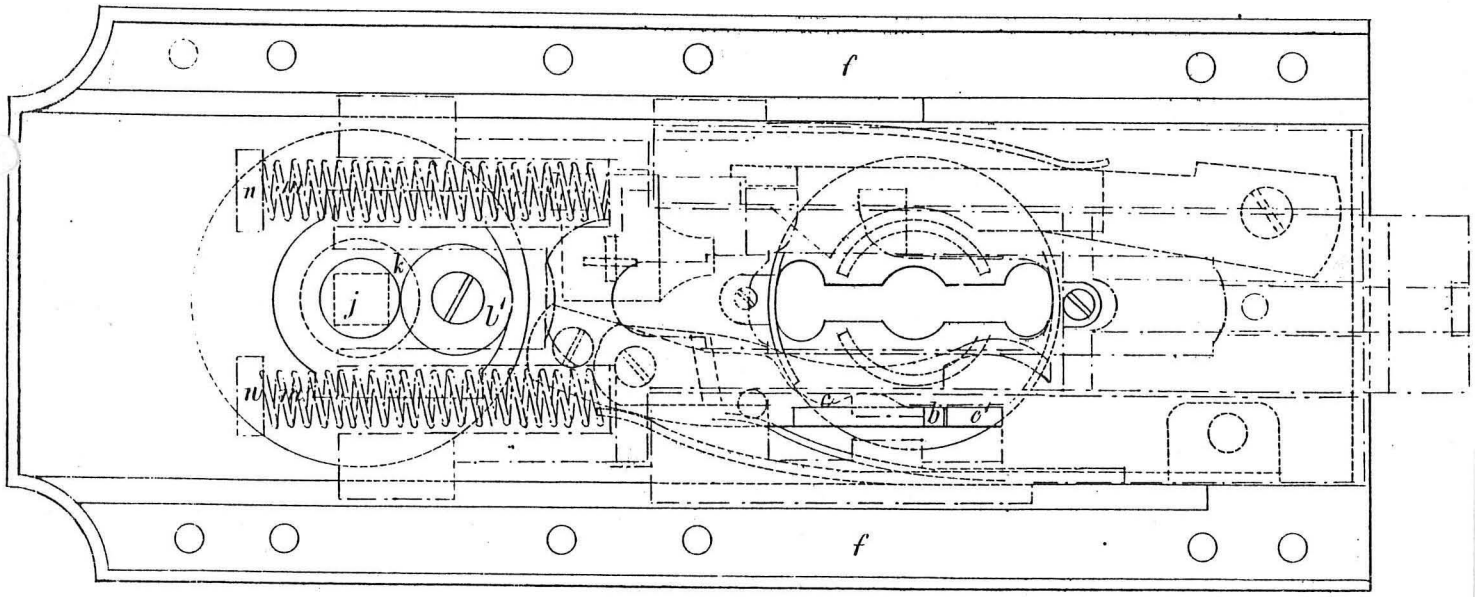


FIG. 3.

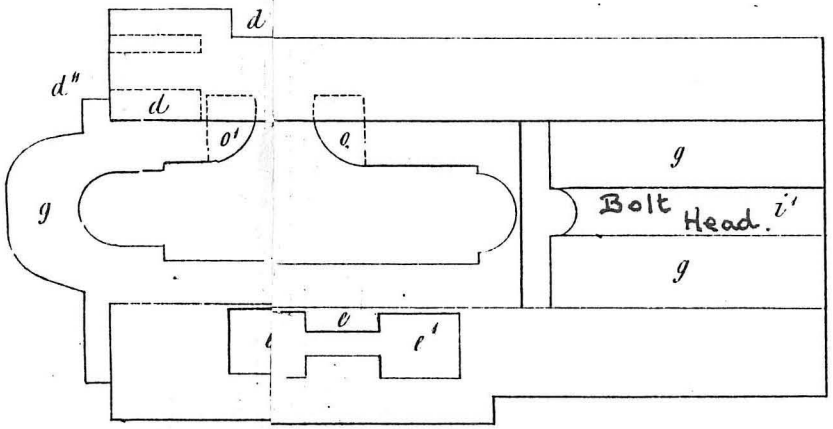


FIG. 4.

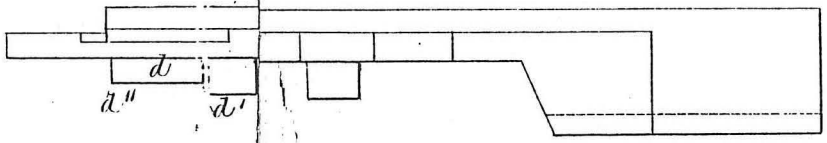


FIG. 5.

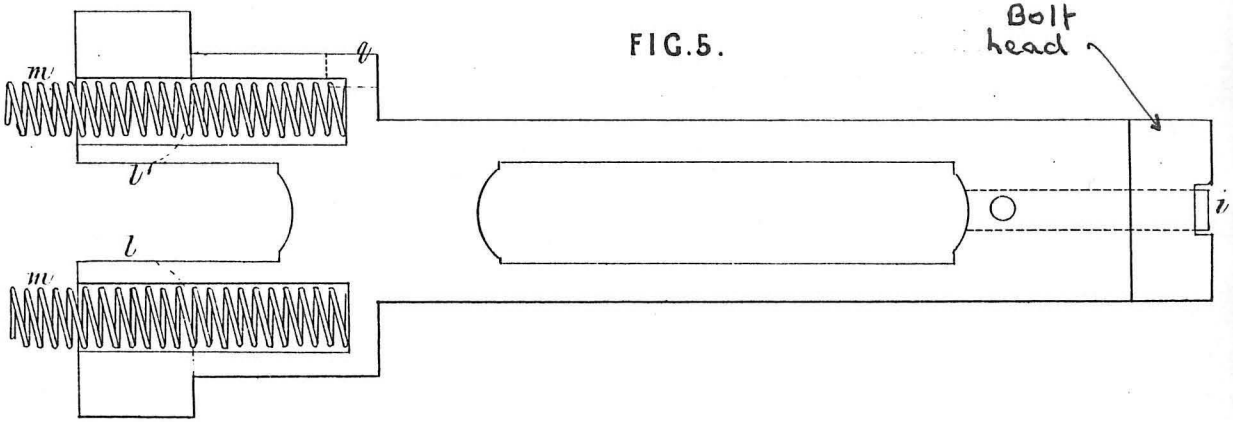


FIG. 6.

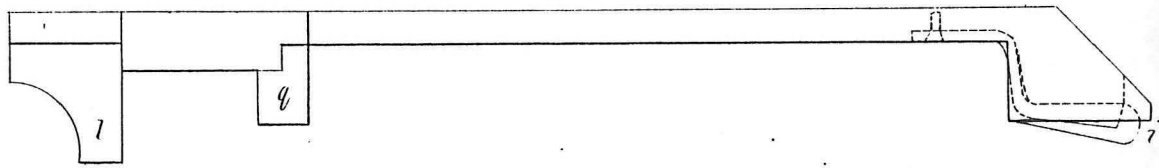
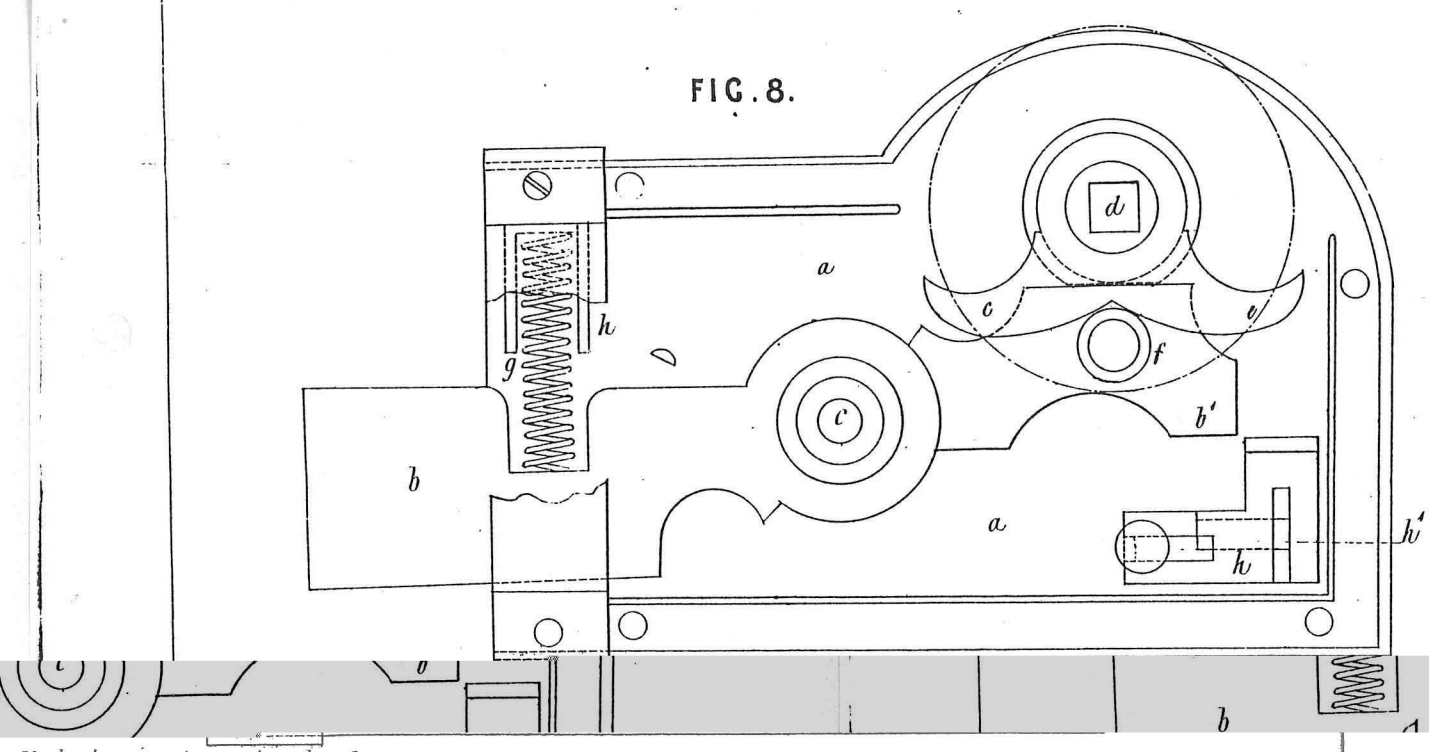


FIG. 8.



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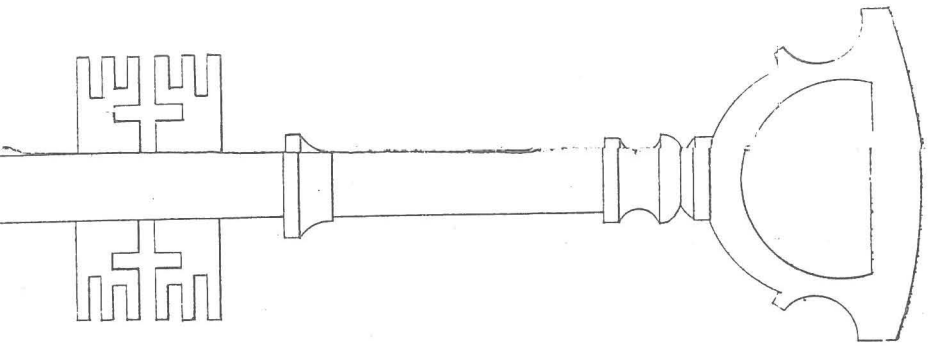

FIG. 7

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Printers to the Queen's most Excellent Majesty. 1857.

FIG. 9.

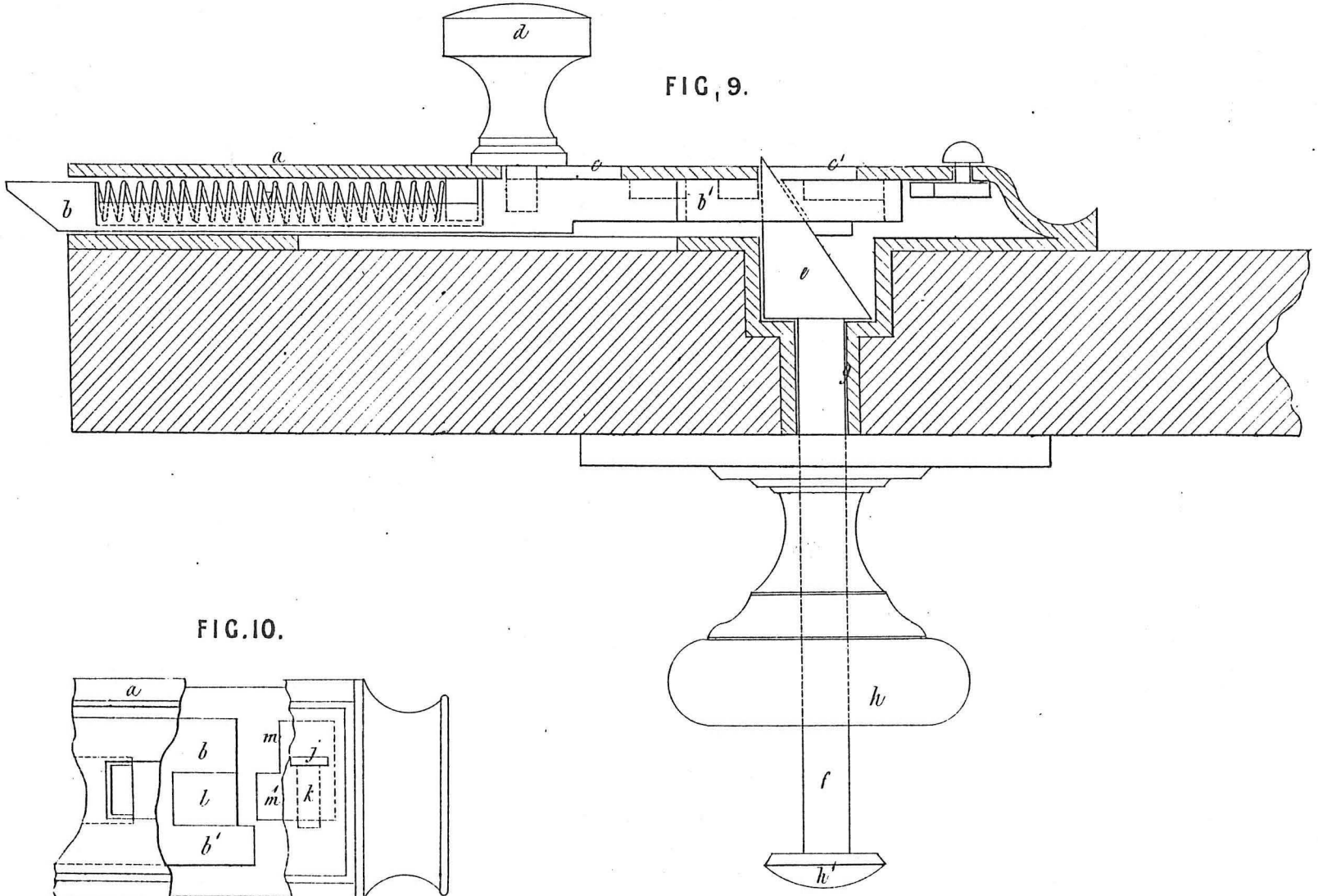

FIG. 10.

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FIG. 13.

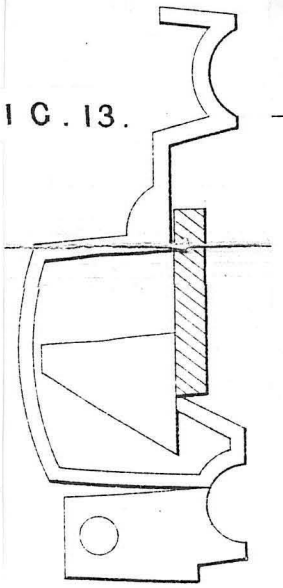


FIG. 11.

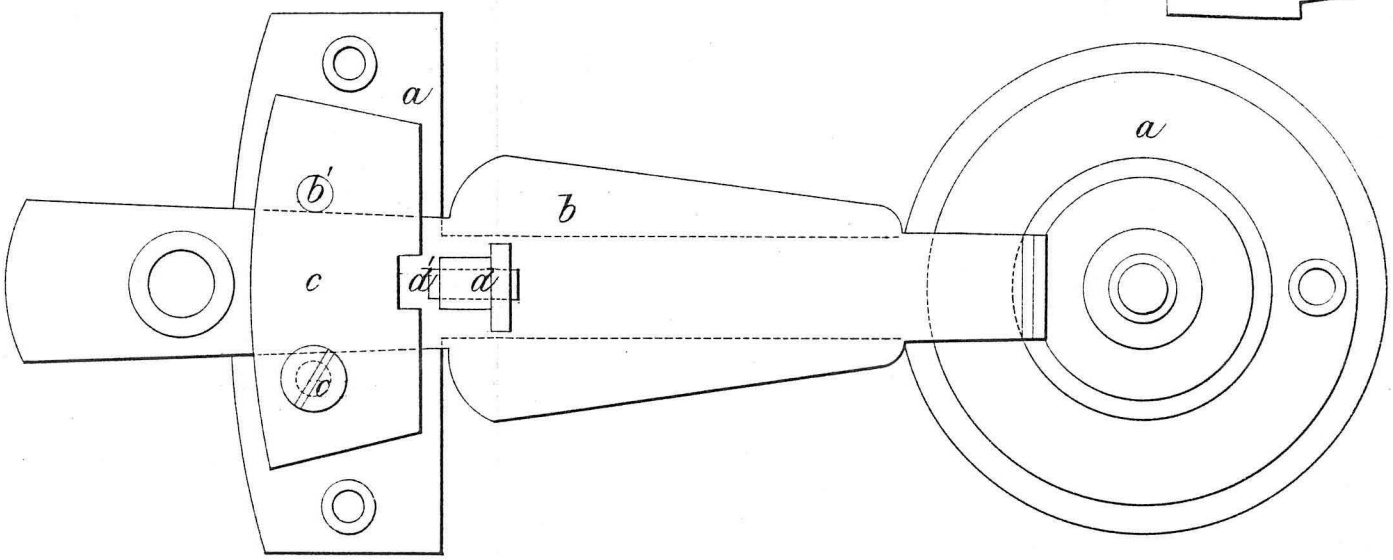


FIG. 15.

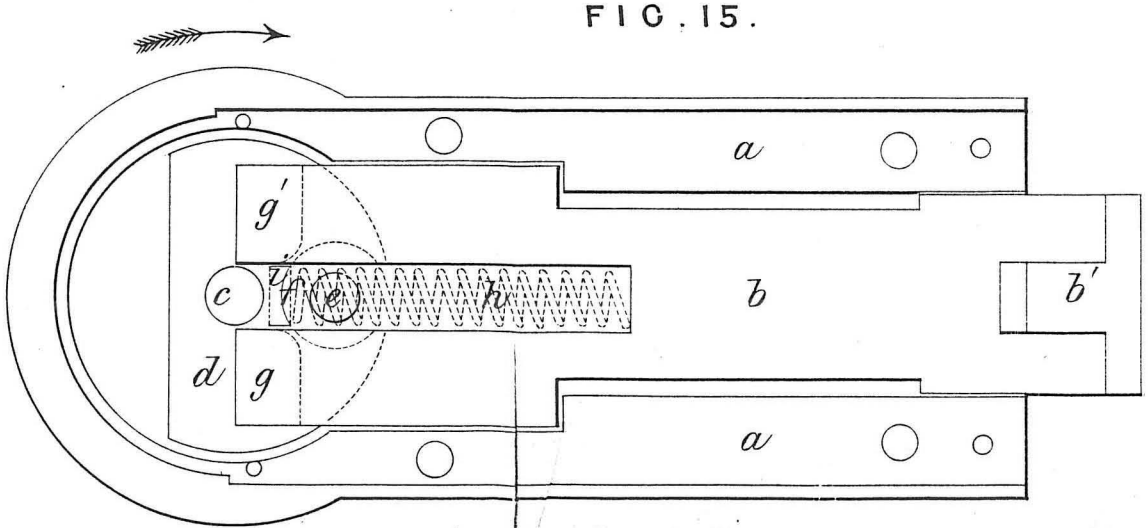


FIG. 12.

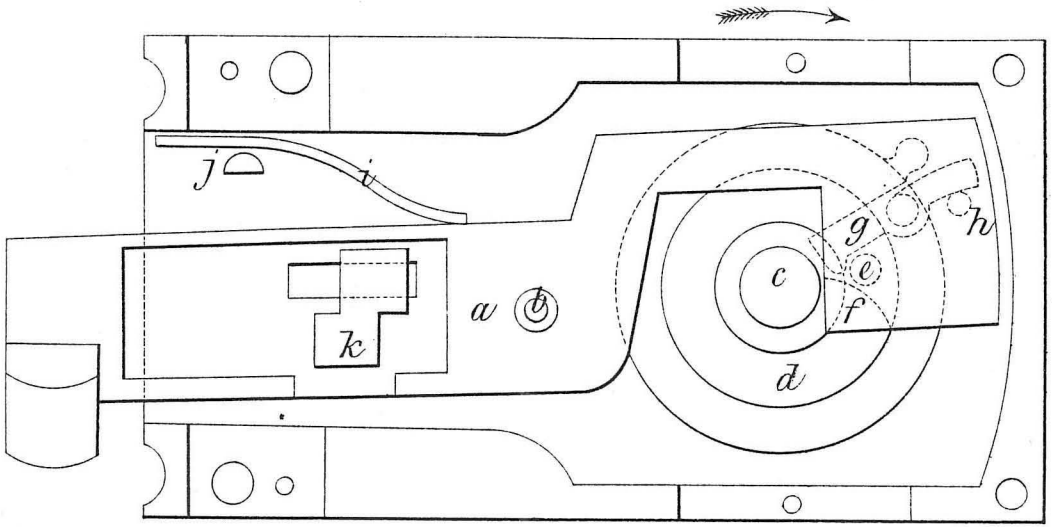


FIG. 14.

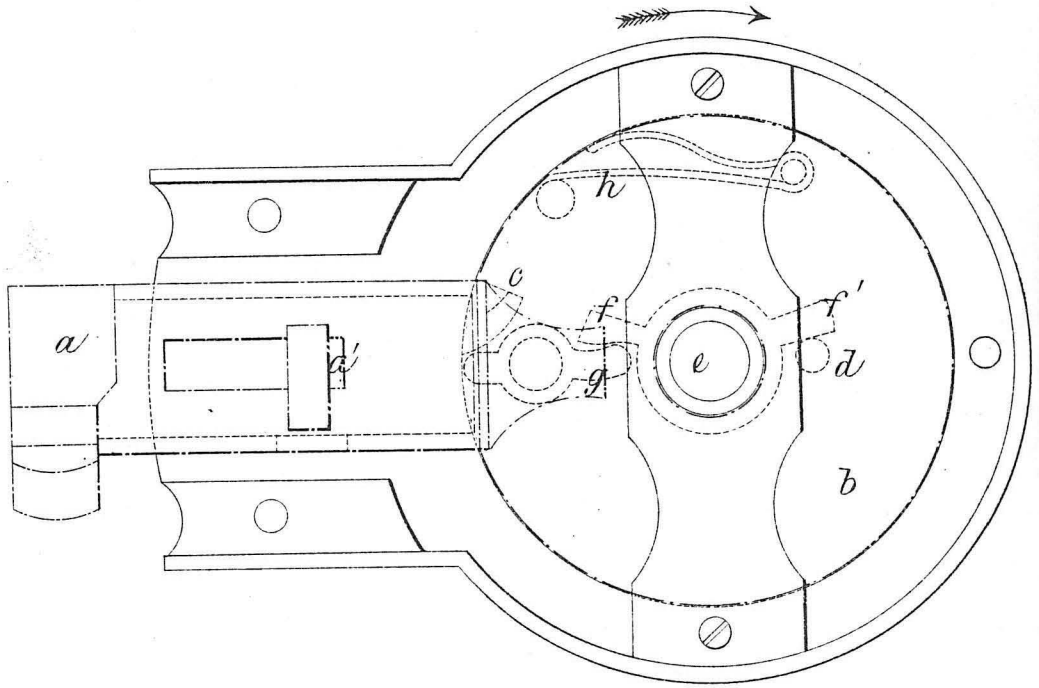


FIG. 16.

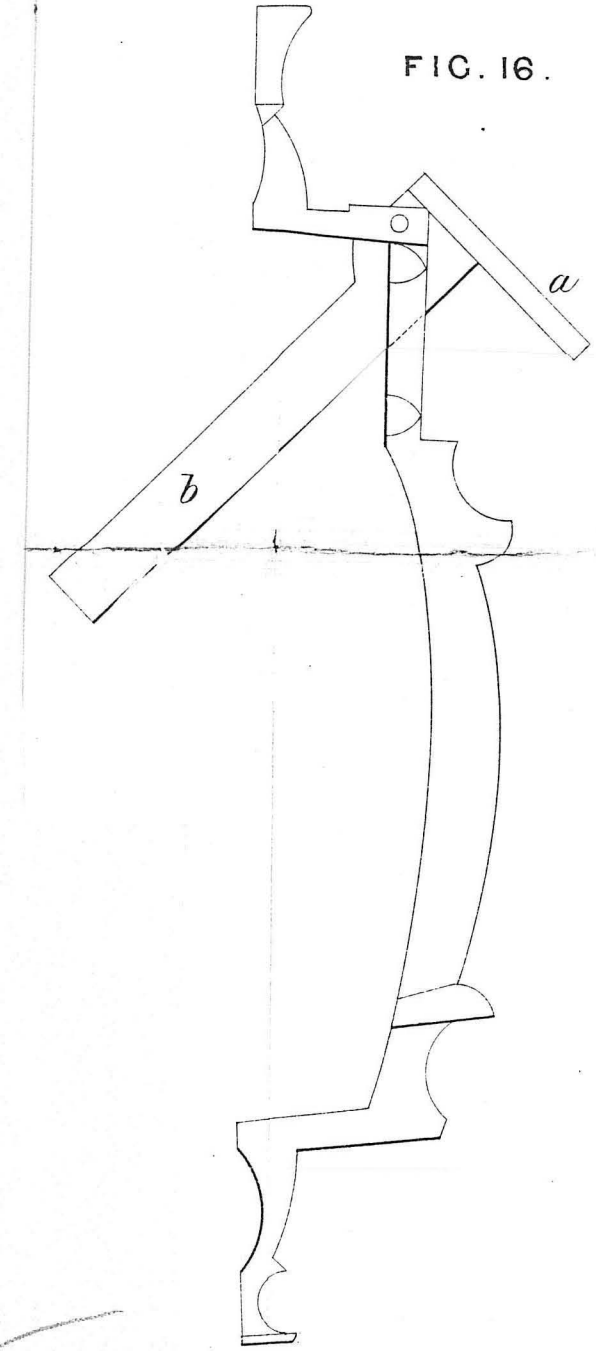


FIG. 17.

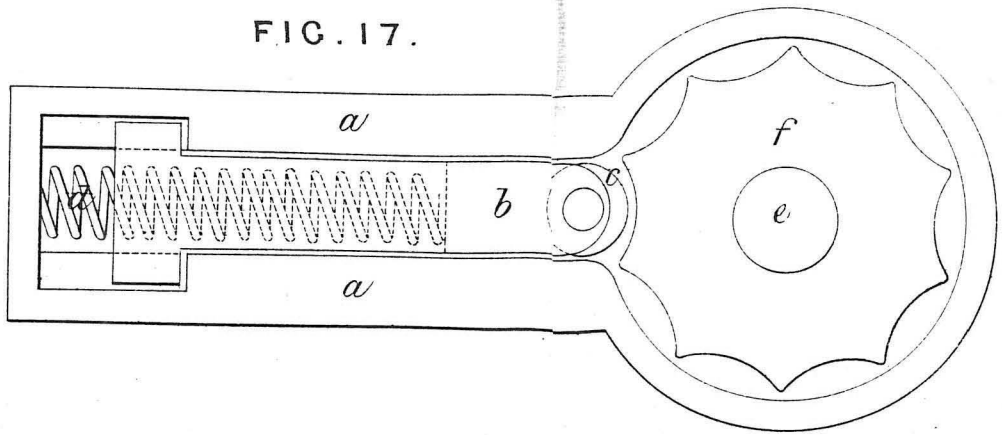


FIG. 18.

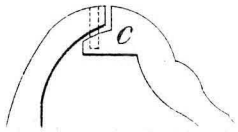


FIG. 18.

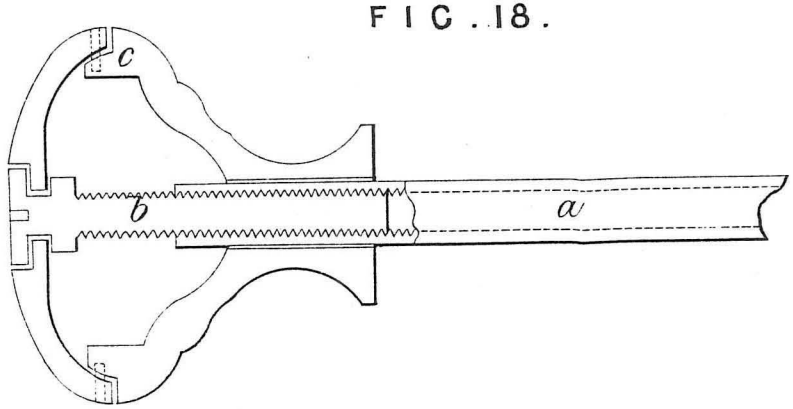
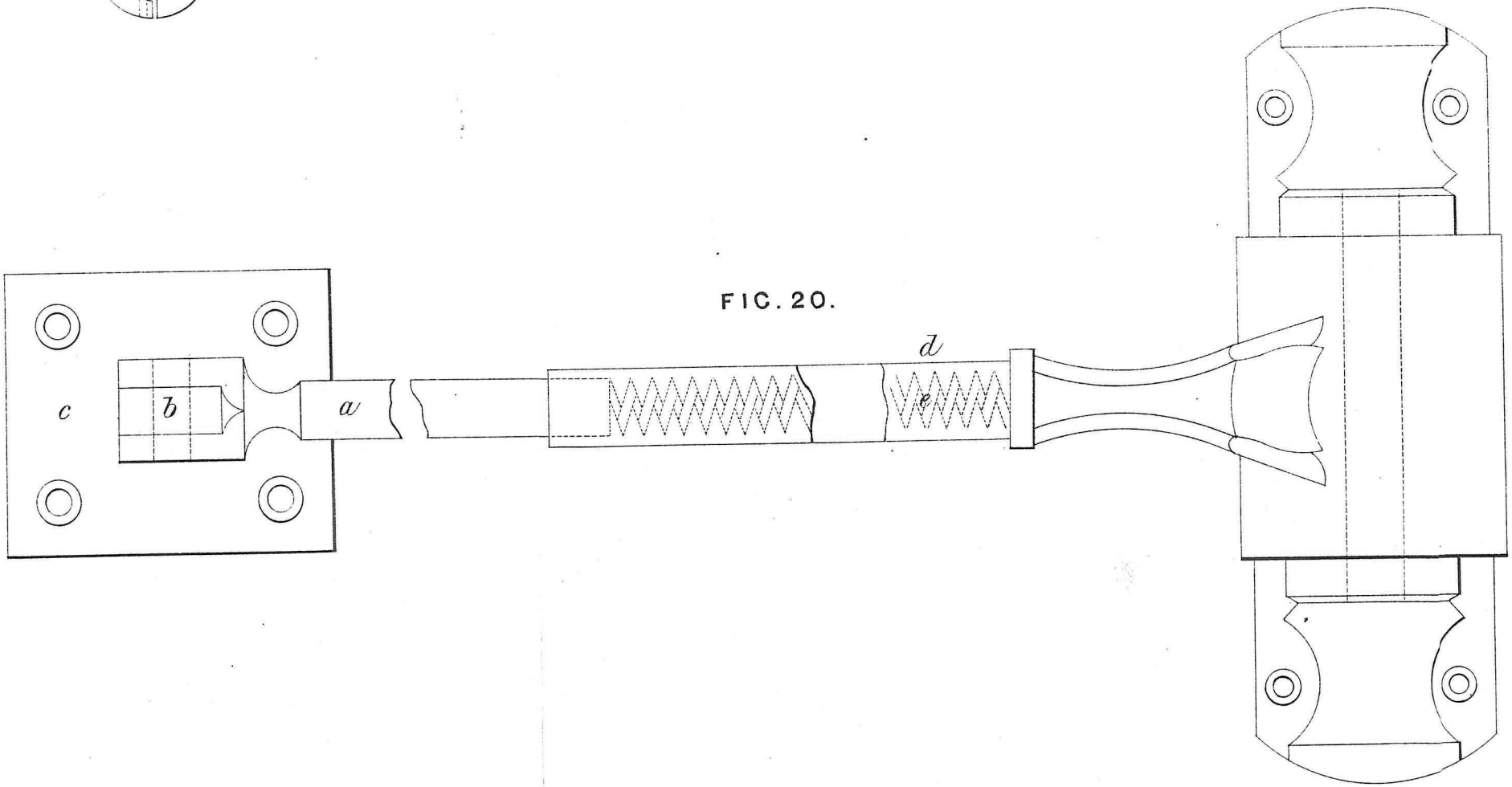


FIG. 20.



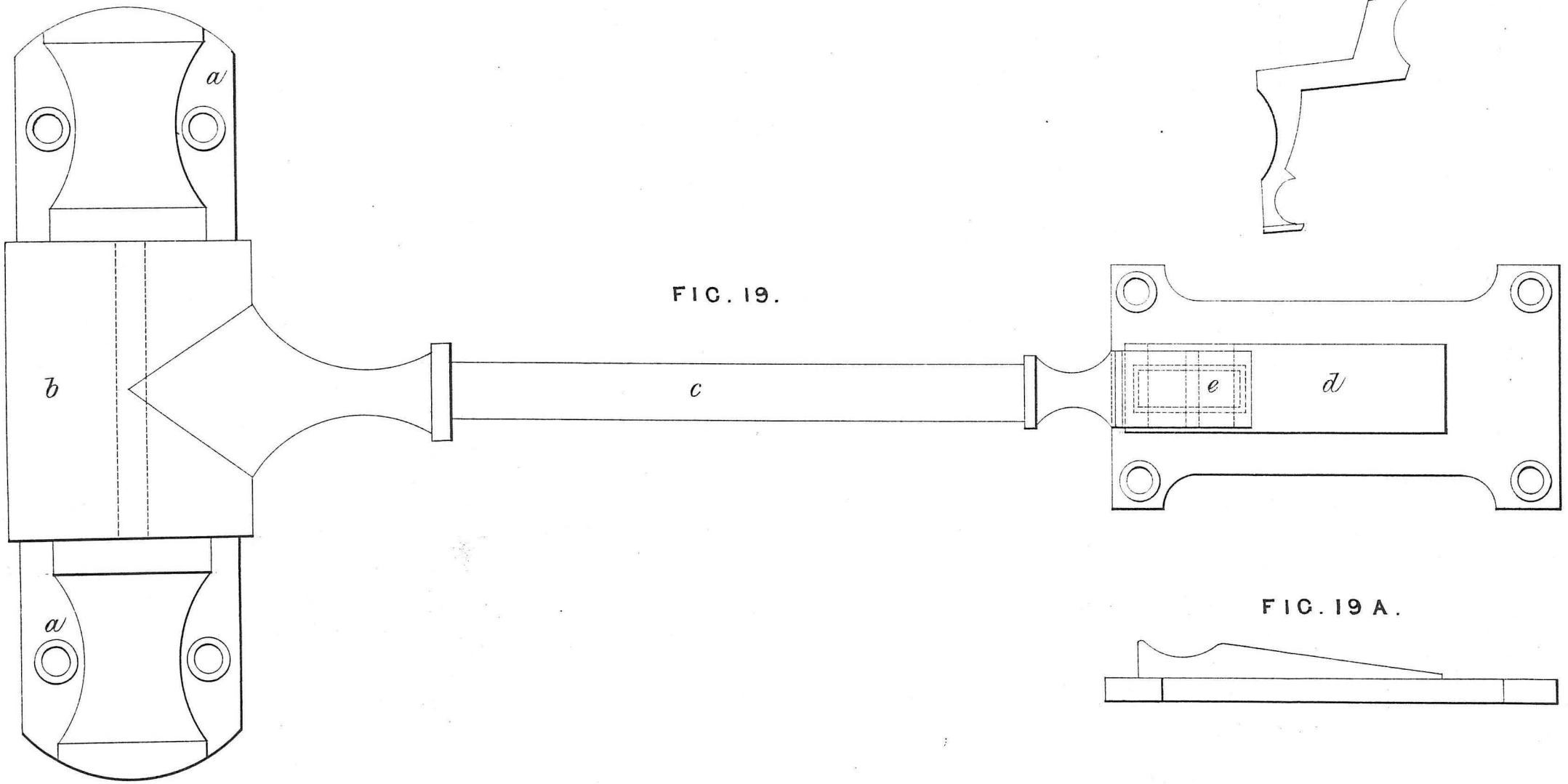


FIG. 19.

FIG. 19 A.

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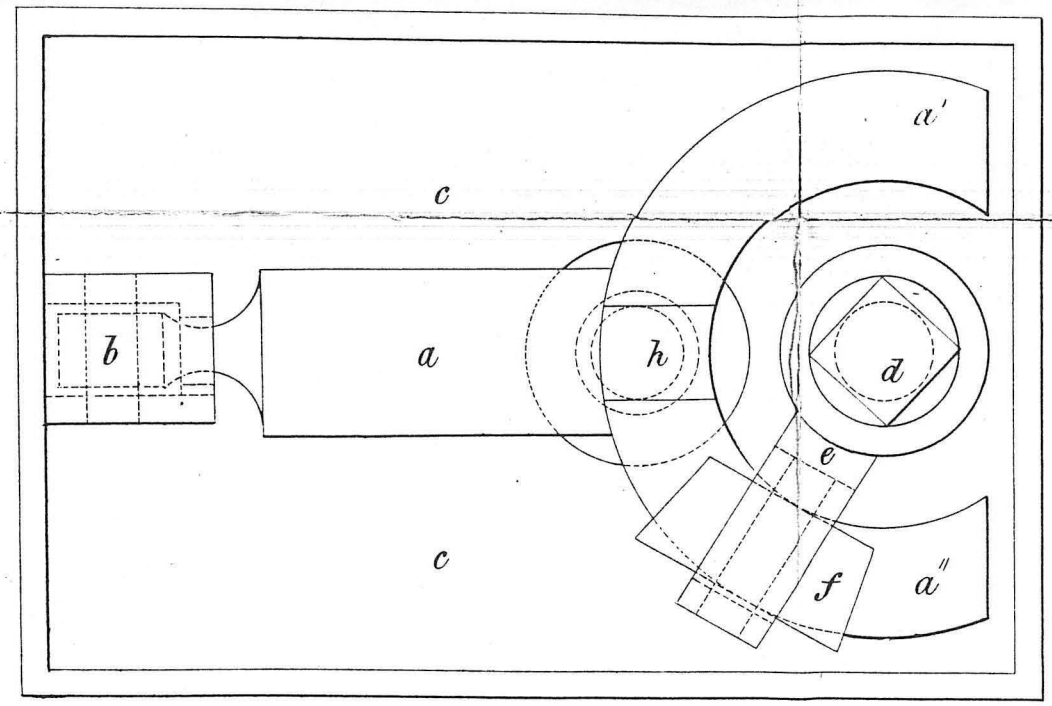

Fig. 22

FIG. 23.

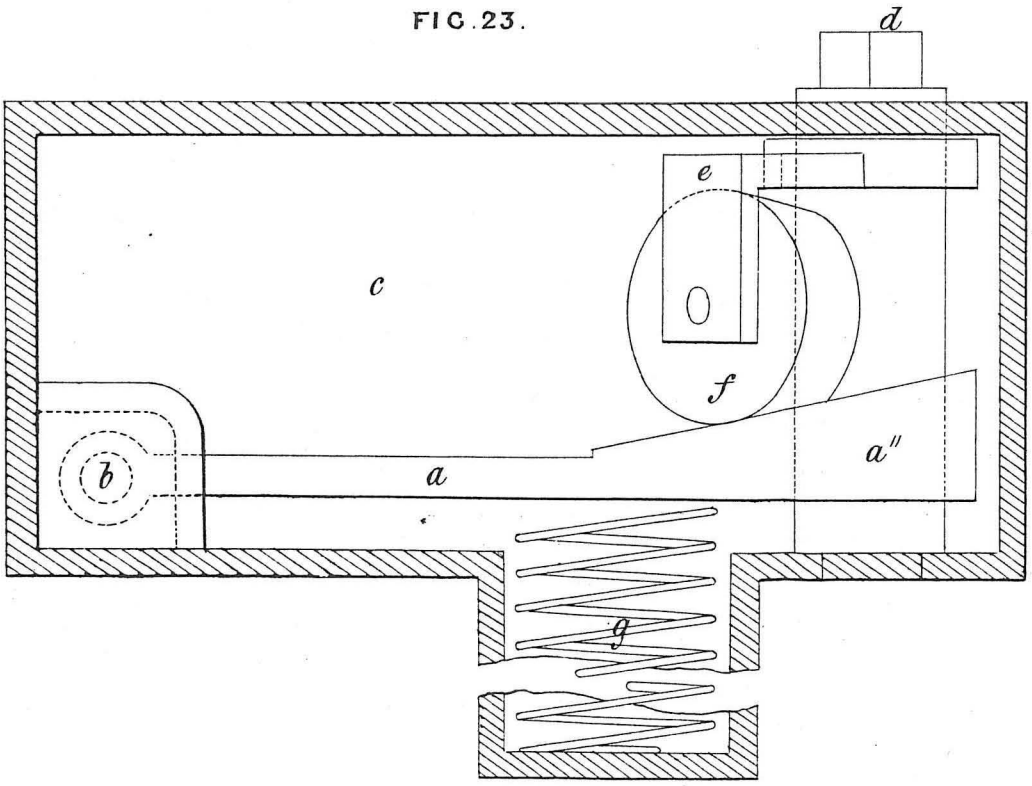

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FIG.26.

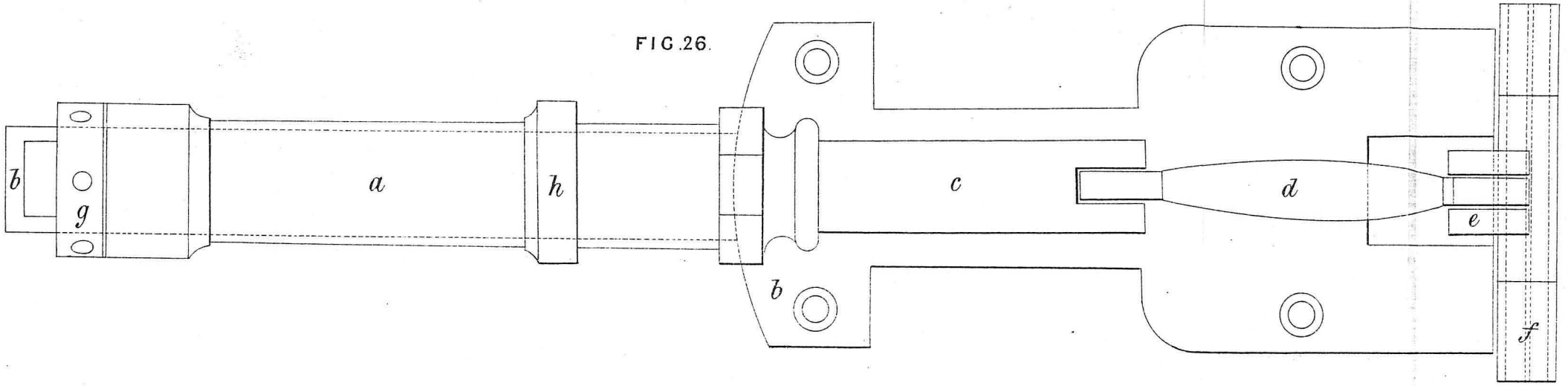


FIG.21.

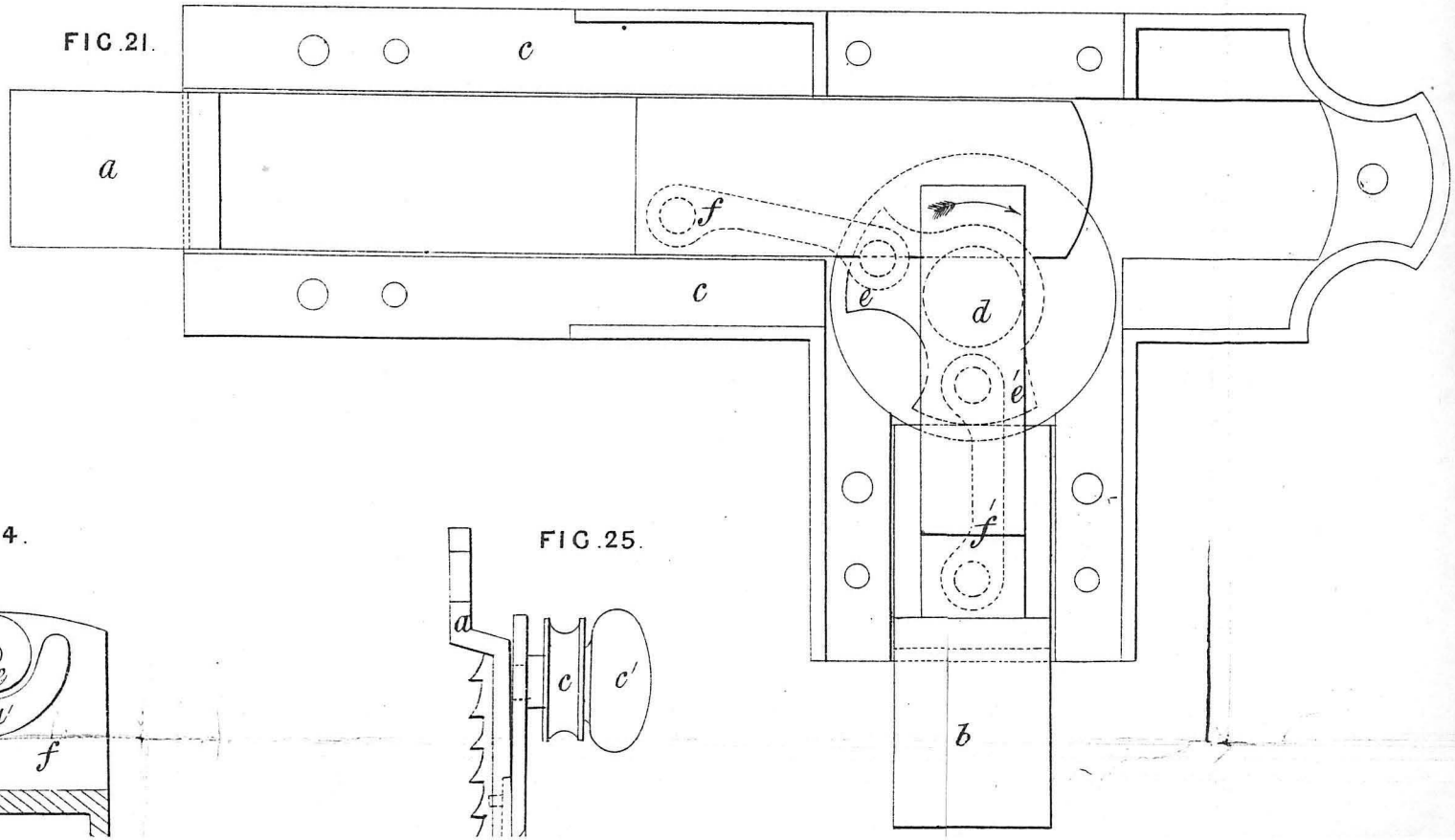


FIG.24.

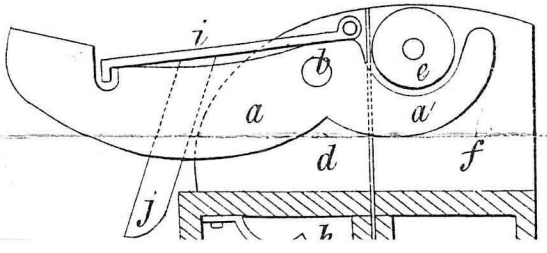


FIG.25.

FIG.24.

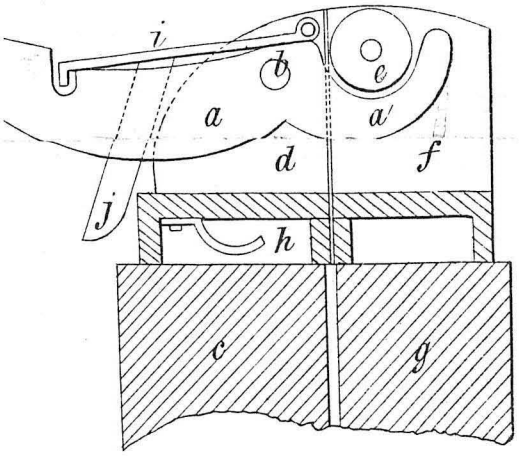
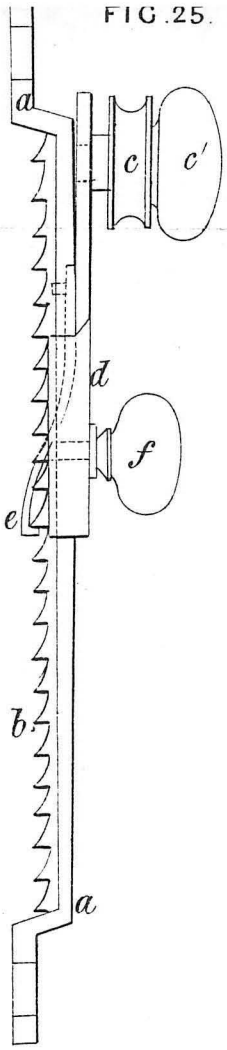


FIG.25.



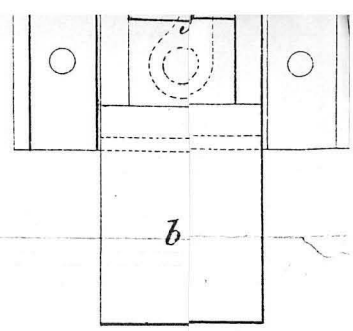
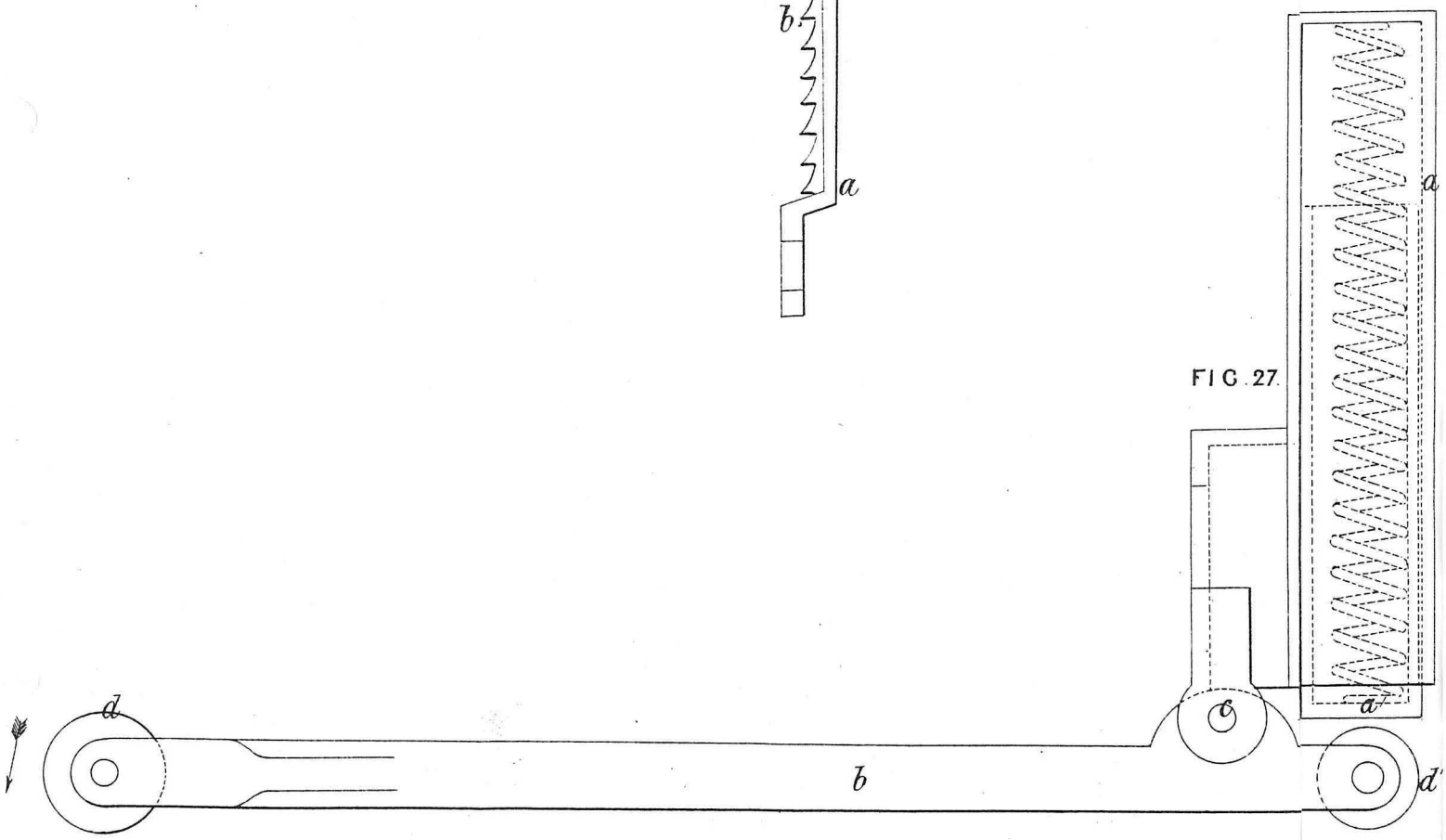


FIG.27.



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A.D. 1846. MAR 25. N°11,152.

COTTERILL'S SPECIFICATION.

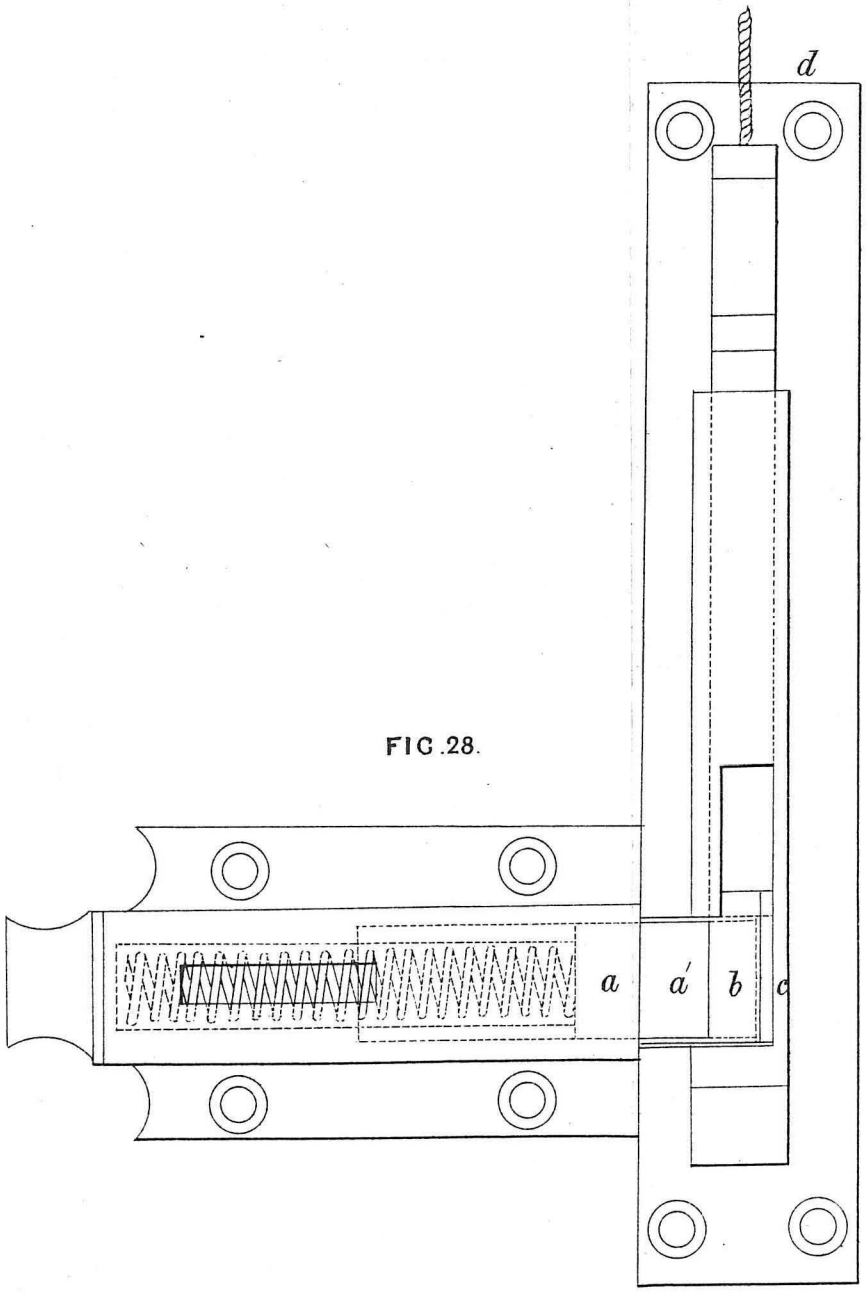


FIG. 28.

FIG. 22.

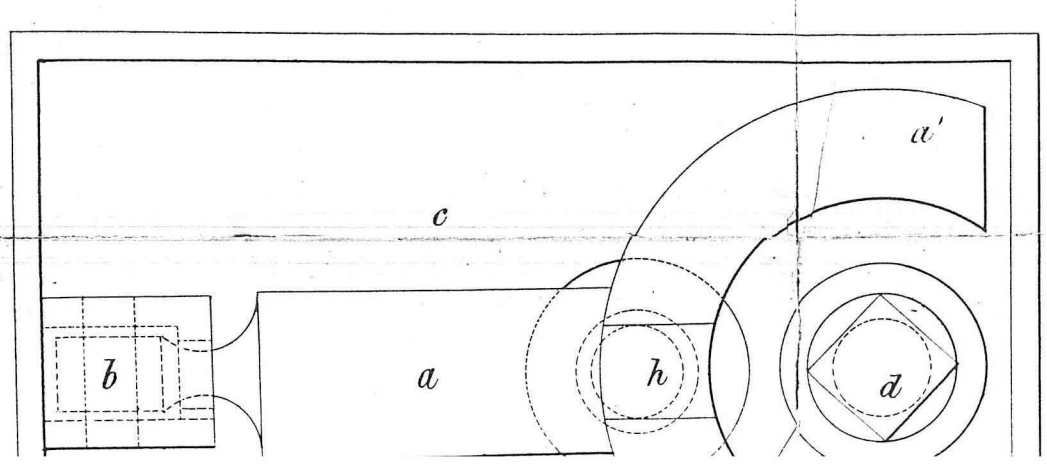
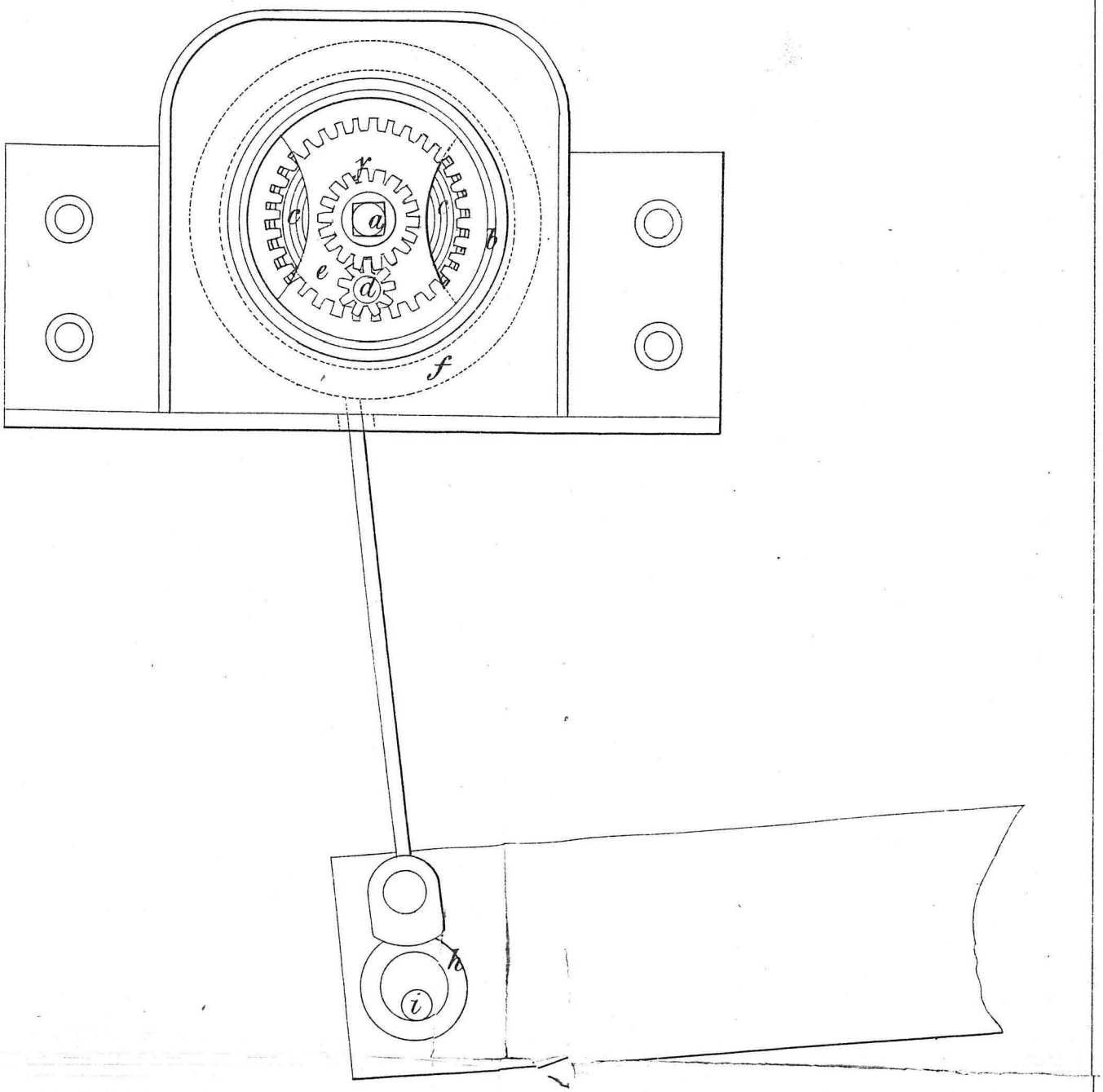


FIG. 29.



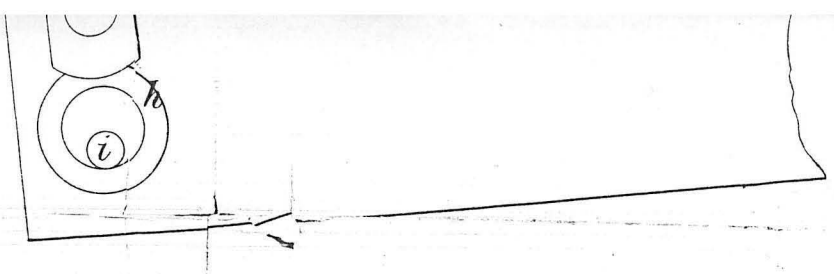


FIG. 30.

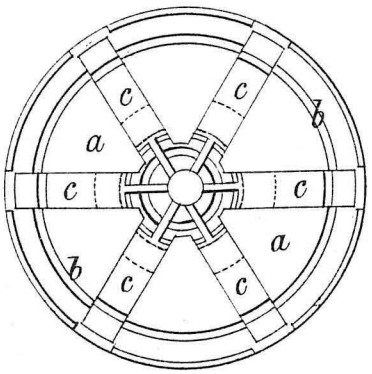


FIG. 32.

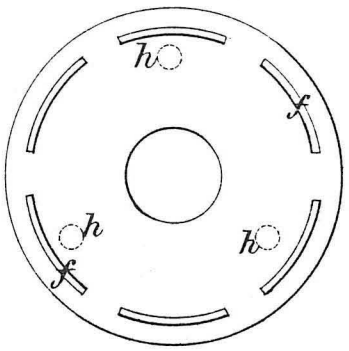


FIG. 31.

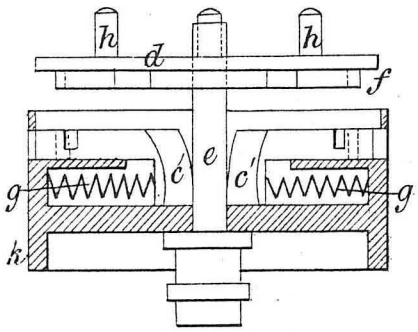


FIG. 33.

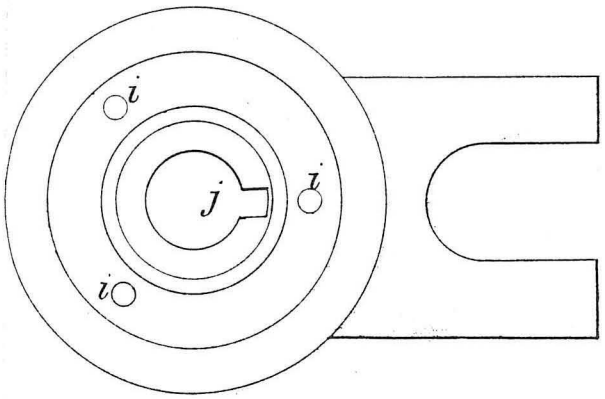


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FIG. 34.

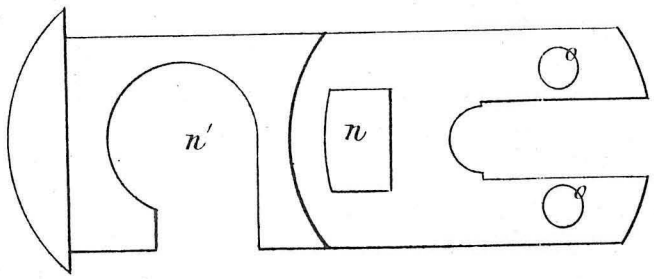

FIG. 35.

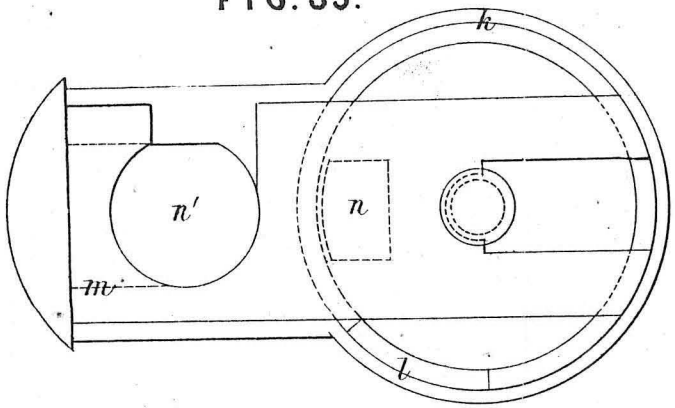

FIG 36.

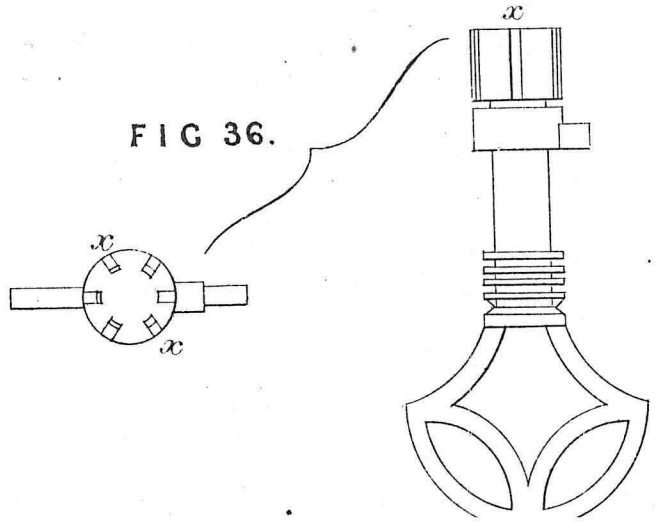

FIG. 37.

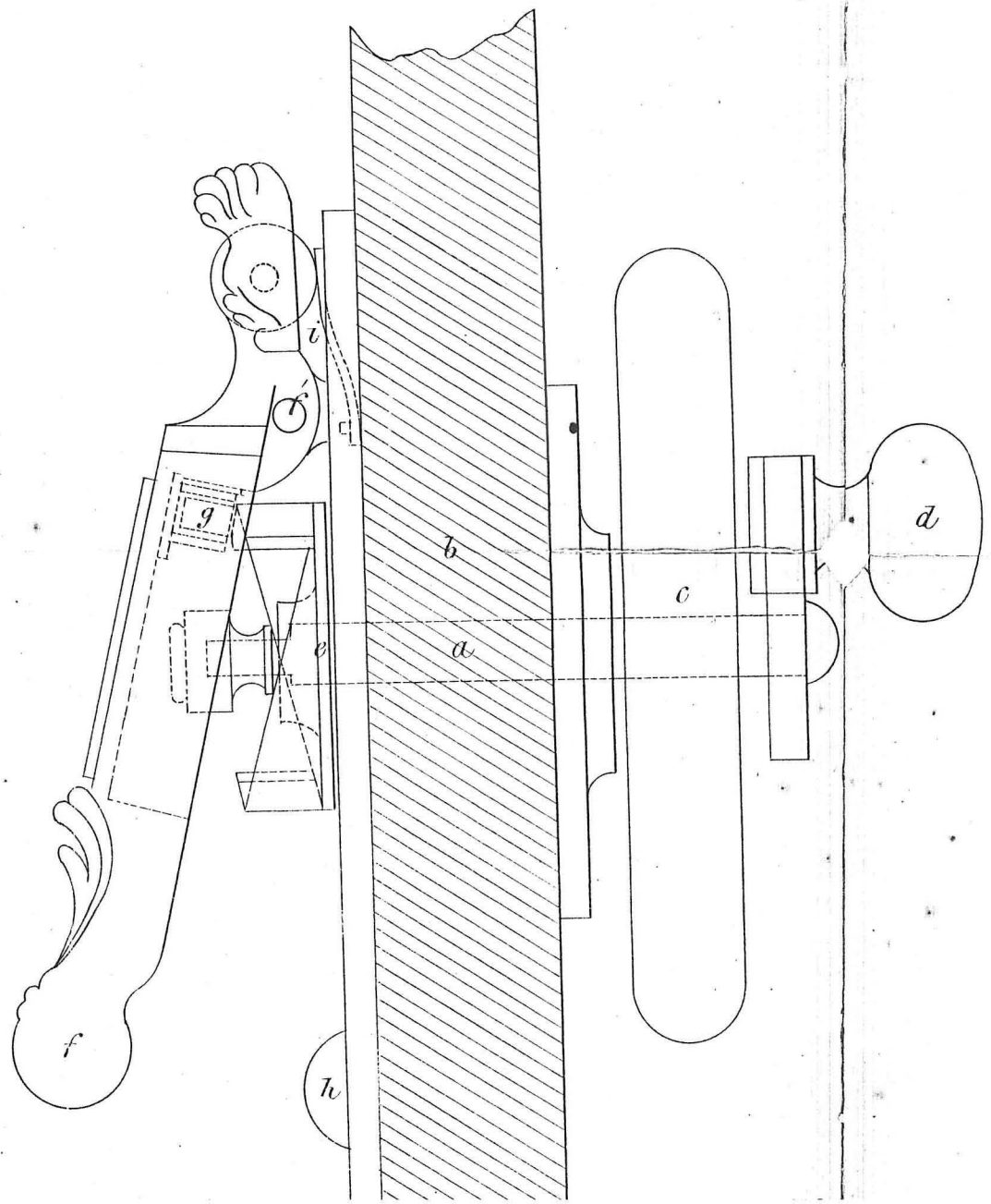

FIG. 38.