

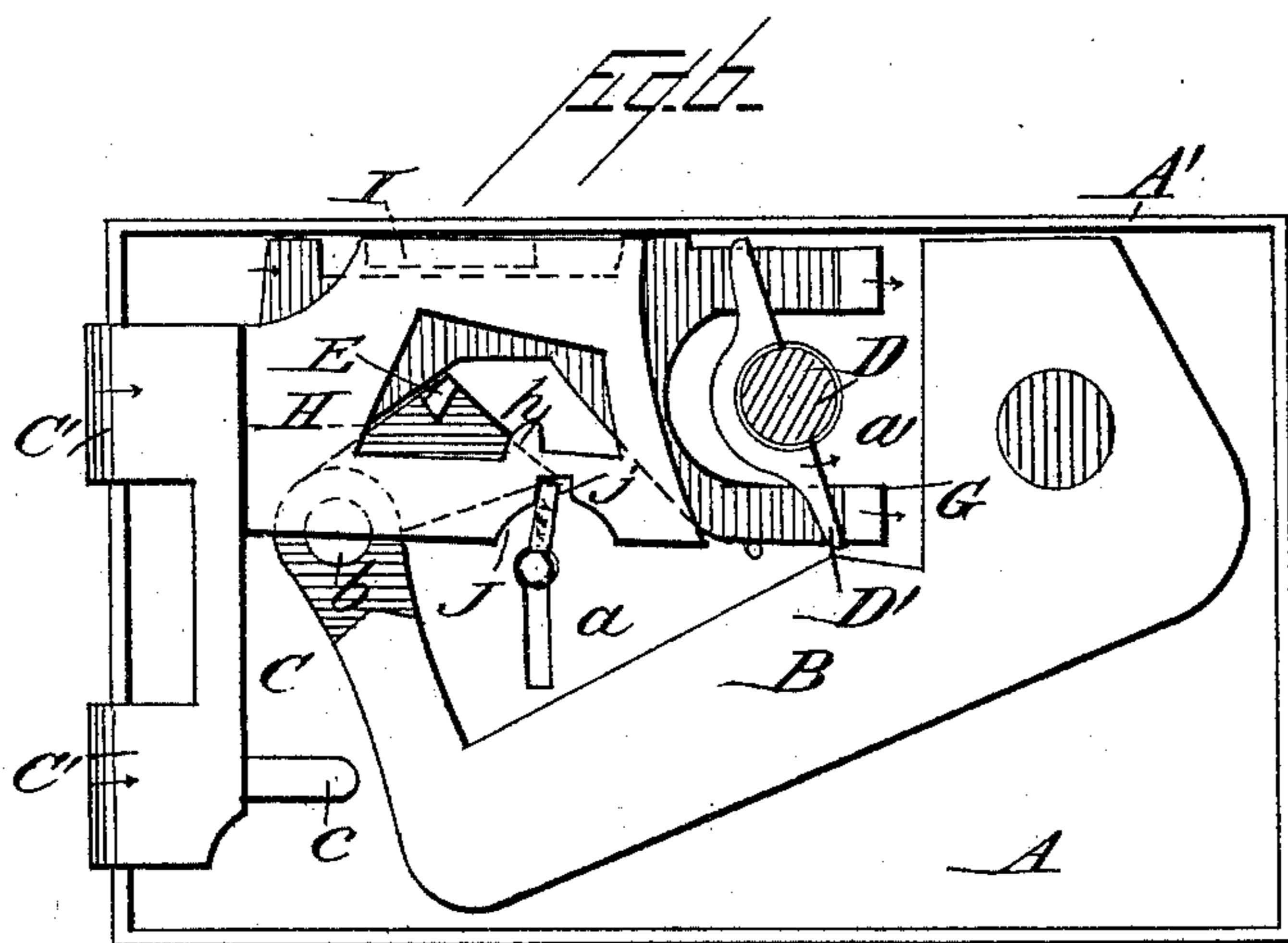
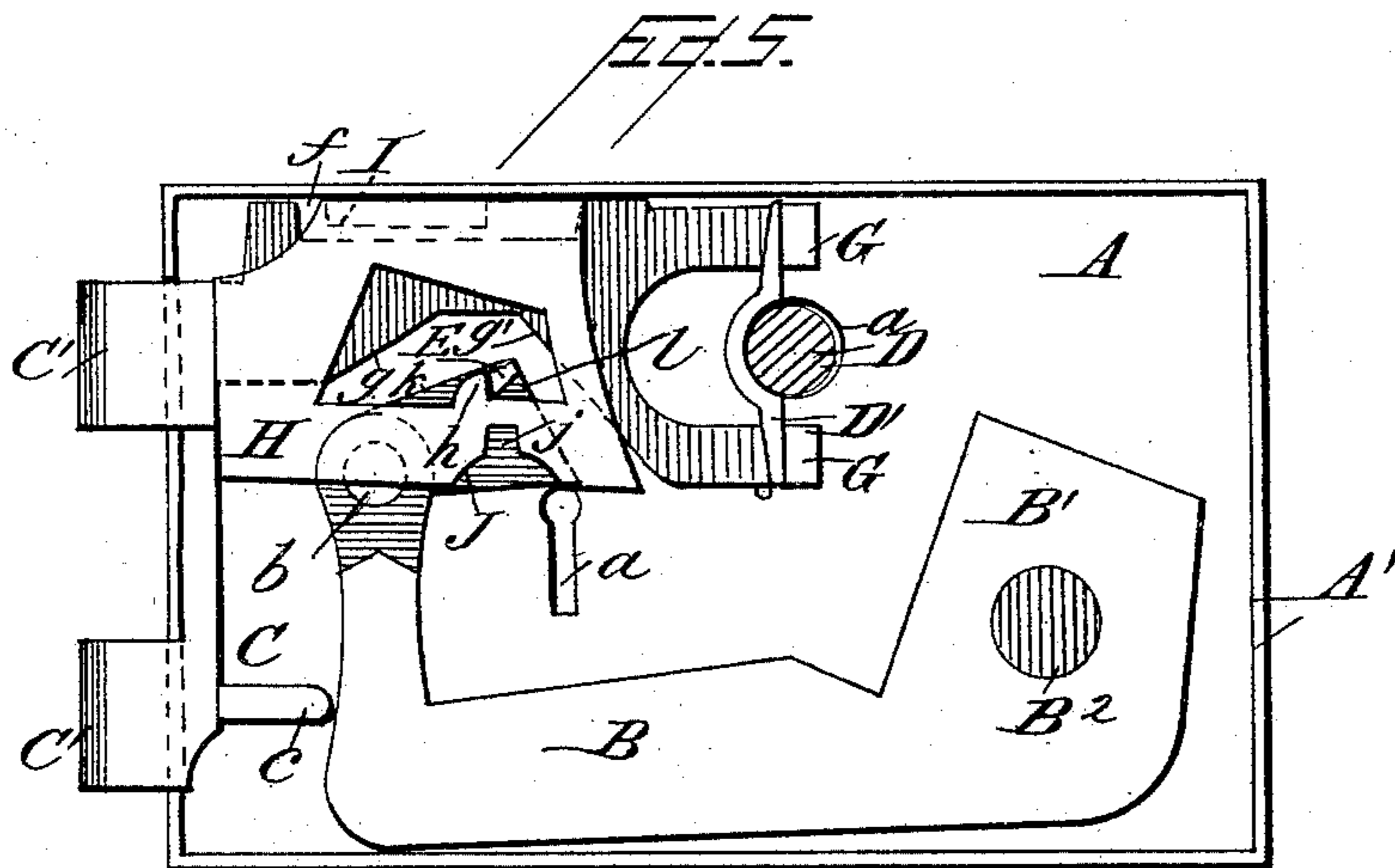
(No Model.)

3 Sheets—Sheet 2.

J. R. PALMER.
GRAVITY LATCH.

No. 474,263.

Patented May 3, 1892.



Attest:

H. H. Schott
Wm. L. Boyden

Inventor
Joel R. Palmer
per Fred E. Vasker,
his Atty.

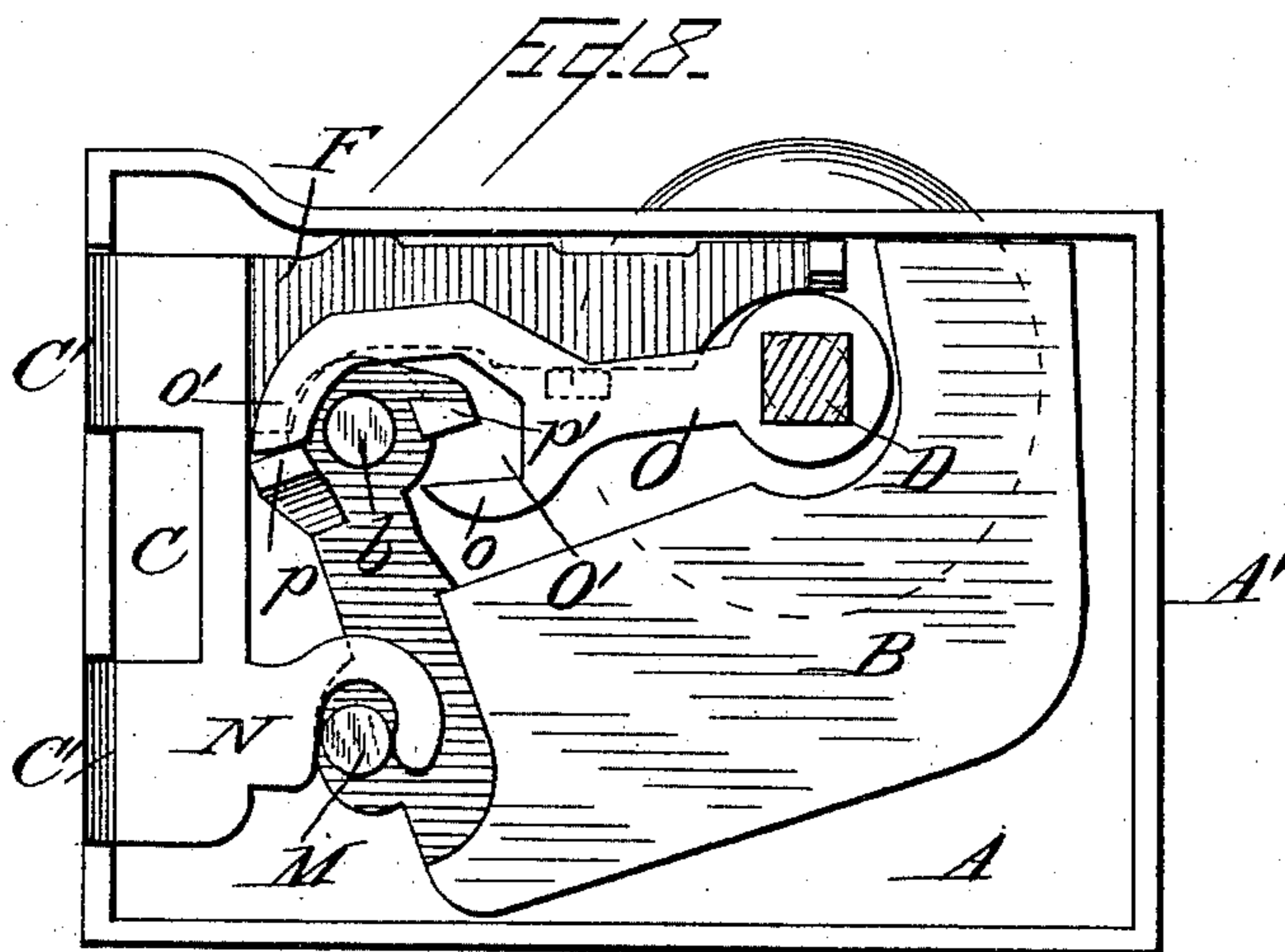
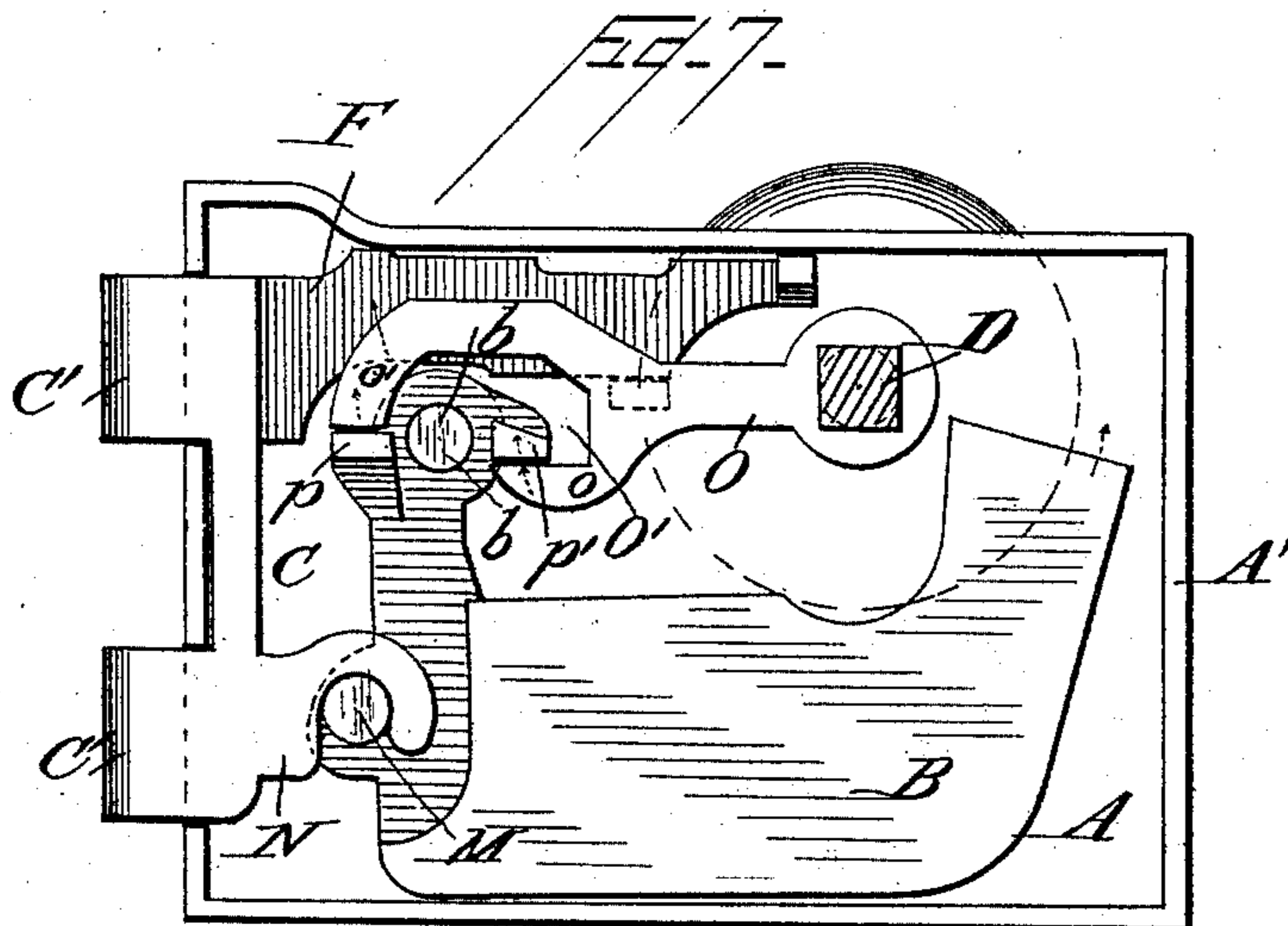
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3 Sheets—Sheet 3.

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Attest:

J. H. Schott
Am. & P. O. Law.

Inventor:

Joel R. Palmer
per Fred C. Parker,
his Atty.

UNITED STATES PATENT OFFICE.

JOEL RUSSELL PALMER, OF SALISBURY, MISSOURI, ASSIGNOR OF ONE-HALF
TO OSCAR PALMER, OF SAME PLACE.

GRAVITY-LATCH.

SPECIFICATION forming part of Letters Patent No. 474,263, dated May 3, 1892.

Application filed August 10, 1891. Serial No. 402,195. (No model.)

To all whom it may concern:

Be it known that I, JOEL RUSSELL PALMER, a citizen of the United States, residing at Salisbury, in the county of Chariton and State of Missouri, have invented certain new and useful Improvements in Gravity-Locks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to an improvement in locks and latches, the primary object thereof being to design a perfect and complete "gravity-operating lock," as I term it—that is to say, one having a gravity-operating hammer or lever within the same, which strikes the latch and protrudes it from the casing and also operates in conjunction with the locking devices to securely hold said latch, when desired, in its projected position; and the invention therefore consists in the construction, arrangement, and combination of parts, substantially as will be hereinafter described and claimed.

In the annexed drawings, illustrating my invention, Figure 1 is a plan view of my improved lock with its casing open and showing the several parts in the position that they occupy when they are in the unlocked condition and when the latch device is in the latched position. Fig. 2 is a similar plan view showing the parts in the position that they occupy when they are in the unlocked and unlatched condition. Fig. 3 is a detail plan view of the locking-plate. Fig. 4 is a vertical edge view of the same, showing the rib or flange thereon. Fig. 5 is a plan view of my improved lock, representing the parts in a locked position. Fig. 6 is a similar plan view representing the parts in the position that they occupy while in the act of locking or unlocking. Fig. 7 is a plan view similar to Fig. 1, the casing being open to expose the inner arrangement of the various parts and showing a modification in the mechanism whereby the knob operates the weighted lever and latch, the parts being represented with the latched device in the latched position and the other parts correspondingly arranged. Fig. 8 is a similar plan view representing the same modification, but showing the parts oc-

cupying a different position—to wit, that which they assume when the latch device is in the unlatched position and the weighted lever has been lifted under the action of a modified form of leverage which is attached to the knob-spindle.

Similar letters of reference designate corresponding parts throughout all the different figures of the drawings.

A represents the bottom plate of the casing of my improved lock, and A' the sides of said casing, its cover being removed, so that all the inner mechanism may be clearly exposed to view. Said casing may of course be of any suitable shape, size, and form, and I do not intend to restrict myself to any particular kind or design of casing, but reserve the liberty of employing any kind that may seem best fitted for the reception of the mechanical parts of the lock.

The plate A of the casing is provided with a key-hole *a* and the perforation *a'*, through which passes the door-knob spindle D.

C designates the latch, which may be of the form shown in the drawings, being a double latch having the two latching parts C' C', which work through suitable slots in the lock-casing, as shown in the several figures of the drawings. The form and shape of this latch may vary within wide limits, and I am restricted to no particular pattern or kind thereof.

The latch C is provided with the inwardly-projecting lug or pin *c*, located near the bottom end thereof; also, the latch C is provided with the integral extension F, which extends alongside one of the longer side walls of the lock-casing. This extension F is provided on its edge adjoining the casing-wall with a recess or slot *f*, which receives a rib or flange on the locking-plate H, to be hereinafter described. The extension F also is provided at its end with a recess G', preferably curved, which partially surrounds the spindle-opening *a'*, and consequently the spindle D. The two end parts of the extension F on each side of the said recess G' are provided with right-angled lugs G G'. The edge of the extension F opposite the recess *f* is provided with another recess which has oppositely-inclined edges *g* and *g'*, into contact with which certain edges on the arm of the gravity-hammer

are designed to come in the manner to be hereinafter set forth.

The knob-spindle D is provided with a couple of oppositely-projecting lugs D' D', preferably cast integral therewith or else rigidly secured thereto, which lugs are adapted to come in contact with the lugs G G on the latch-extension F. These lugs D' D' may be provided by affixing short strips to the side of the knob-spindle; but I prefer to cast them integral with said spindle, so as to make the construction simpler and cheaper. It will be obvious that when the knob is rotated the said projections D' will act upon the lugs G to shift the latch and retract it within the casing. (See Fig. 2.)

B designates a bent lever, its bend being, preferably, approximately on a right angle at B⁴, the shorter arm of this right-angled lever being pivoted at *b* by means of a suitable pivot pin or stud *b'*, fixed in the lock-casing. The long arm of this right-angled lever B is enlarged at the outer end at B', so as to be weighted or heavy. Said enlarged end B' may, if desired, be provided with an inserted piece of some very heavy metal, which is located within a slot or opening at B². This additional weight B² supplements the weight of the end of the lever and causes the said lever to act more forcibly under the action of gravity. The pin *c* on the latch C comes in contact with the right-angled lever B near the bend B⁴, so that this bent part of the lever acts as a hammer to drive against the pin *c*, and thus force outward the latch. Thus, supposing the bent lever to be in the position shown in Fig. 2, it will fall by the action of gravity in the direction of the arrow and by acting against the pin *c* will impel the latch forward and protrude its latch part through the slots in the lock-casing. The bent lever B is furthermore provided at a point beyond its pivot *b* with an extension or arm B³, having an inclined edge *k*, which is adapted to come in contact at certain times with the inclined edge *g* on the latch-extension F, and having also its end formed with inclined edge *l*, which is adapted to lie contiguous to the inclined edge *g'* at certain times, as shown in Figs. 1 and 5. The extension or arm B³ is furthermore provided on one of its sides with a lug E, projecting therefrom.

H designates the locking-plate. It is shown in detail plan view in Fig. 3 and in edge view in Fig. 4. It lies in contact with the latch-extension F and slides thereover. It is provided with a rib or flange I, which enters the recess *f* and works therein. This flange I therefore guides and limits the movement endwise of the plate H. This plate H is provided with a central opening H' of suitable size and shape, so that the plate is in reality a skeleton plate. The plate has a lug *h* projecting inwardly into the opening H'. It also has on its lower edge a curved recess J, and in this curved recess is an auxiliary right-angled recess *j*. The curved recess J and the

auxiliary recess *j* lie contiguous to the key-hole *a*, and said recesses are designed to receive the key, so that by this engagement of the key with the locking-plate the said plate may be shifted in one direction or the other. (See Fig. 6.) The lug *h* is designed to operate in conjunction with the lug E. When the parts are in the position shown in Fig. 1, the lug E is located with the lug *h* on the right-hand side of it. When the parts are in the position shown in Fig. 5, the lug E is located with the lug *h* on the left-hand side. In Fig. 1 the parts are unlocked and in Fig. 5 they are locked. It is therefore by shifting the locking-plate so that the lug *h* may be on the left-hand side of the lug E that the parts are locked. In unlocking the plate H is shifted back, so that the lug *h* lies on the right-hand side of the lug E. Thus the weighted lever has a certain engagement or disengagement at different times with the locking-plate, dependent upon the locked or unlocked condition of the parts.

I will now proceed to describe the operation of my improved lock and latch. As we have already seen, when the knob is turned so as to rotate the knob-spindle D the latch C will be shifted, so as to withdraw the latch parts C' within the case. In other words, the door may be unlatched in the ordinary way. During this operation of unlatching the pin *c* will strike against the bent weighted lever B and will oscillate said lever on its pivot, lifting the weighted end thereof. Consequently by rotating the spindle D the parts will be changed from the position shown in Fig. 1 into the position shown in Fig. 2, where they are unlatched and where the weighted end of the lever is lifted. If now the only desire of the person manipulating the knob is to open the door, it is evident that as soon as he releases his hold upon the knob the weighted lever will fall back into its normal position and thrust out the latch again into its projected position in the usual manner. Suppose, however, that he desires to lock the door. He will first manipulate the knob, thus withdrawing the latch and lifting the weighted lever. Then when the parts are in the position shown in Fig. 2 or Fig. 6 he will insert the key and turn it, as shown in Fig. 6, so that it will engage with the slot J and the auxiliary recess *j* in the locking-plate H, and by turning said key around he will shift said locking-plate, so as to throw the end of said locking-plate against the adjoining shoulder on the latch C, and also place the lug *h* in such position that when the weighted lever falls, which it will of course do as soon as the operator releases his hold upon the door-knob, the lug E will fall to the right of the lug *h* instead of dropping down to the left thereof, as it would have done had not the locking-plate H been shifted and as it actually does do in Figs. 1 and 2. In other words, the locking-plate H having been shifted by the key into the position shown in Fig. 5 the lug E will,

when the weighted lever falls back, be thrown into the position shown in said figure, where it is on the right hand of the lug *h*. It will now be seen that the parts of the lock are locked, and as the latch is protruded it also is in engagement and the door is latched and locked securely. The locking-plate *H* forms, as it were, a brace between the latch *C* and the lug *E*, and inasmuch as said lug is stationary and immovable so long as the weighted lever remains down the door will be securely locked and cannot be opened except by the intervention of a key.

In order to unlock the door, the key will be inserted in the key-hole and turned in the reverse position, and the result of so turning it will be to lift the lever-arm *B*³, thus lifting the lug *E* away from the position to the right of the lug *h*, and then by continuing the rotation of the key it will be caused to engage the recesses *J* and *j*, and thus the plate *H* will be moved sufficiently far to carry the lug *h* to the right of the lug *E*, and the unlocking will consequently be effected, after which the operator by grasping the knob of the door can unlatch it in the usual way.

In Figs. 7 and 8 I have represented a modified form of the mechanism whereby the knob-spindle is permitted to actuate the weighted lever, and thus impart motion to the latch device for the purpose of retracting or projecting the latter. The latch *C*, instead of having the projecting pin *c*, is provided with a curved finger *N*, which engages a pin or stud *M* on the weighted lever *B*. *O* designates a lever, which is provided at one end with a square opening to permit the passage therethrough of the square knob-spindle *D*, whereby a firm and rigid connection is made between the spindle and the lever, so that the lever will be oscillated whenever the spindle is rotated. The lever *O* is provided at its other end with a recess *O'*, which provides two fingers or projections *o o'*, that are designed, respectively, to operate against projections or lugs *P'* and *P*, formed on the weighted lever *B* at points on opposite sides of the pivot *b*, on which the lever *B* turns. Thus it will be

seen that as the lever *O* is oscillated in one direction the finger or arm *o'* will bear upon the lug *P*, and thus the weighted lever *B* will be shifted, and also when the lever *O* is oscillated in the opposite direction the finger *o* will bear upon the lug *P'* and the lever *B* will turn upon its pivot and be shifted in the opposite direction. By this modified form of mechanism therefore I provide a very simple and efficient knob-tumbler which can be used to great advantage in many instances.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a lock, the combination of the latch *C*, having the extension *F*, provided with lugs *G*, the weighted lever *B*, having the arm *B*³, provided with lug *E*, and the sliding locking-plate *H*, having central opening *H'* and lug *h* and the key-recesses *J j*, substantially as described.

2. The combination of the latch *C*, having the extension *F*, provided with recesses *f* and *G'* and lugs *G*, the gravity-lever *B*, pivoted at *b* and provided with the arm *B*³, having lug *E*, and the sliding locking-plate *H*, having rib *I*, entering recess *f* and having the central opening *H'*, wherein is lug *h*, said plate having also the key-slot, substantially as described.

3. The combination of the latch *C*, having the extension *F*, provided with the recess *f* on one edge and the recess *G'* at one end, on each side of which are lugs *G*, the bent lever *B*, pivoted at *b* and having the arm *B*³, provided with lug *E*, the sliding plate *H*, having rib *I*, that enters recess *f*, and having likewise central opening *H'*, wherein is lug *h*, and having also slots *J j* to receive the key, and the knob-spindle *D*, having lugs or projections *D'* thereon, all arranged substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOEL RUSSELL PALMER.

Witnesses:

J. D. BRUMMALL,
G. W. WELKER.