

No. 632,620.

Patented Sept. 5, 1899.

C. BACKER.
AUTOMATIC DEAD LATCH LOCK.

(Application filed Mar. 16, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

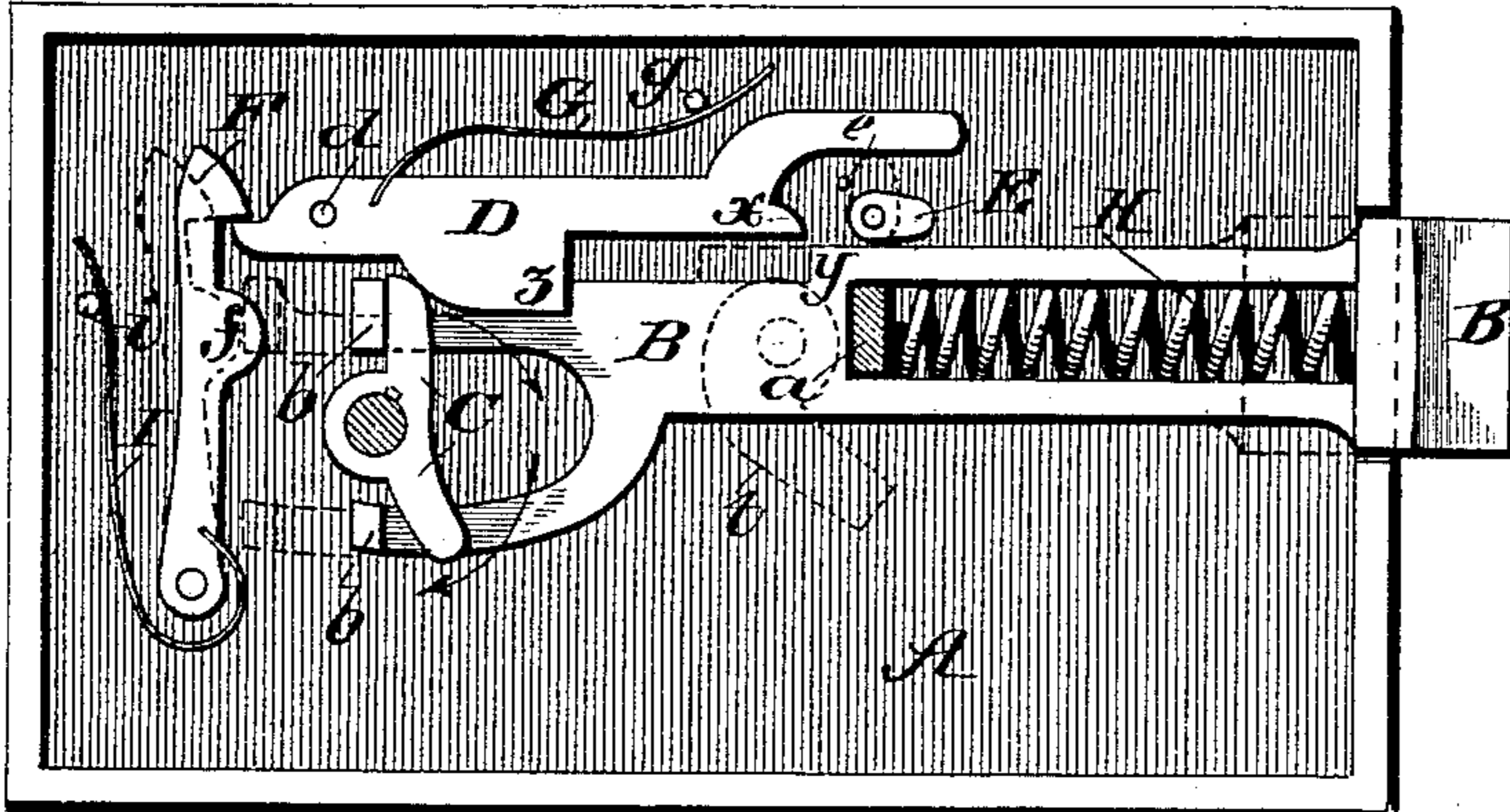
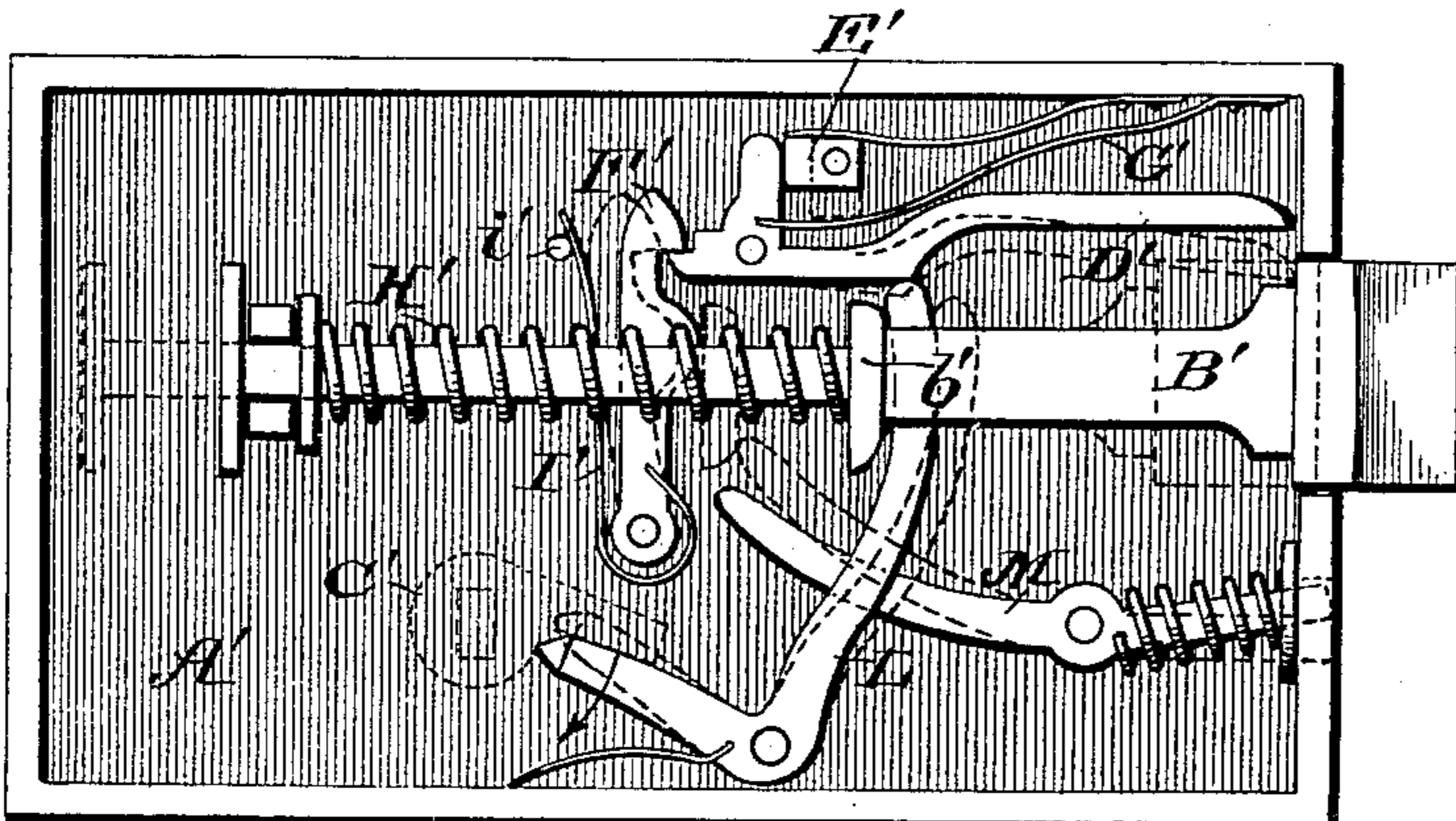


Fig. 2.



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Fig. 3.

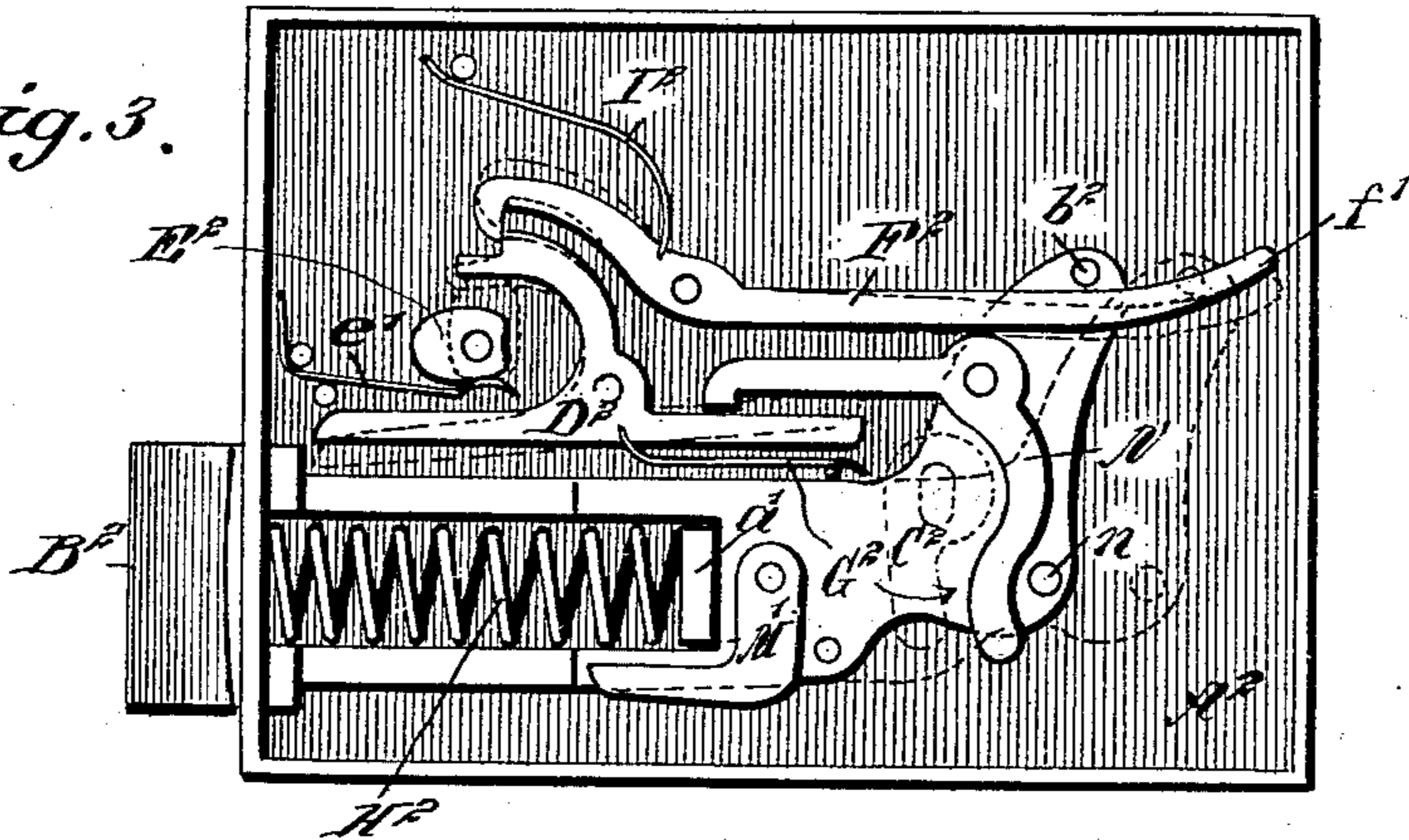


Fig. 4.

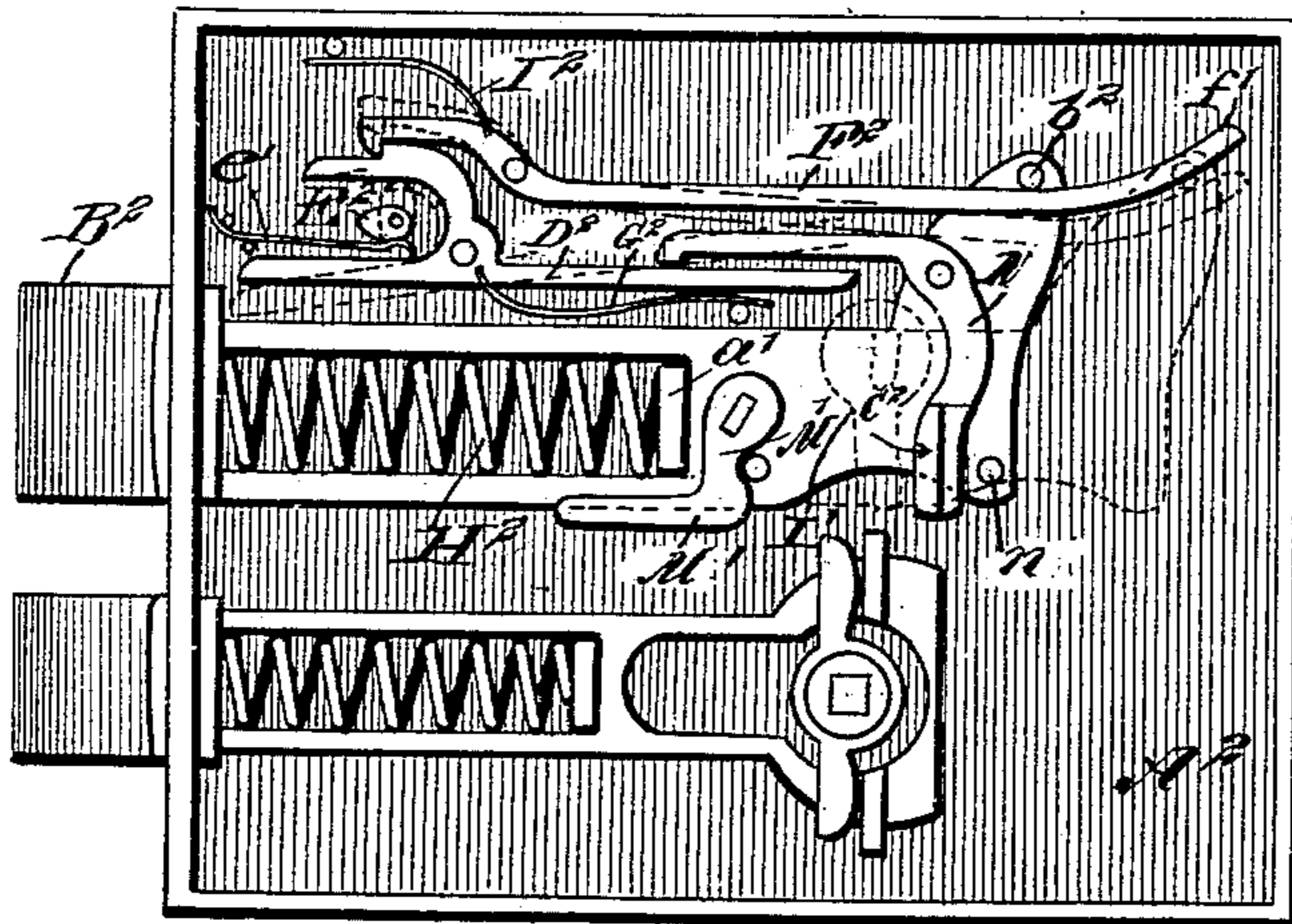
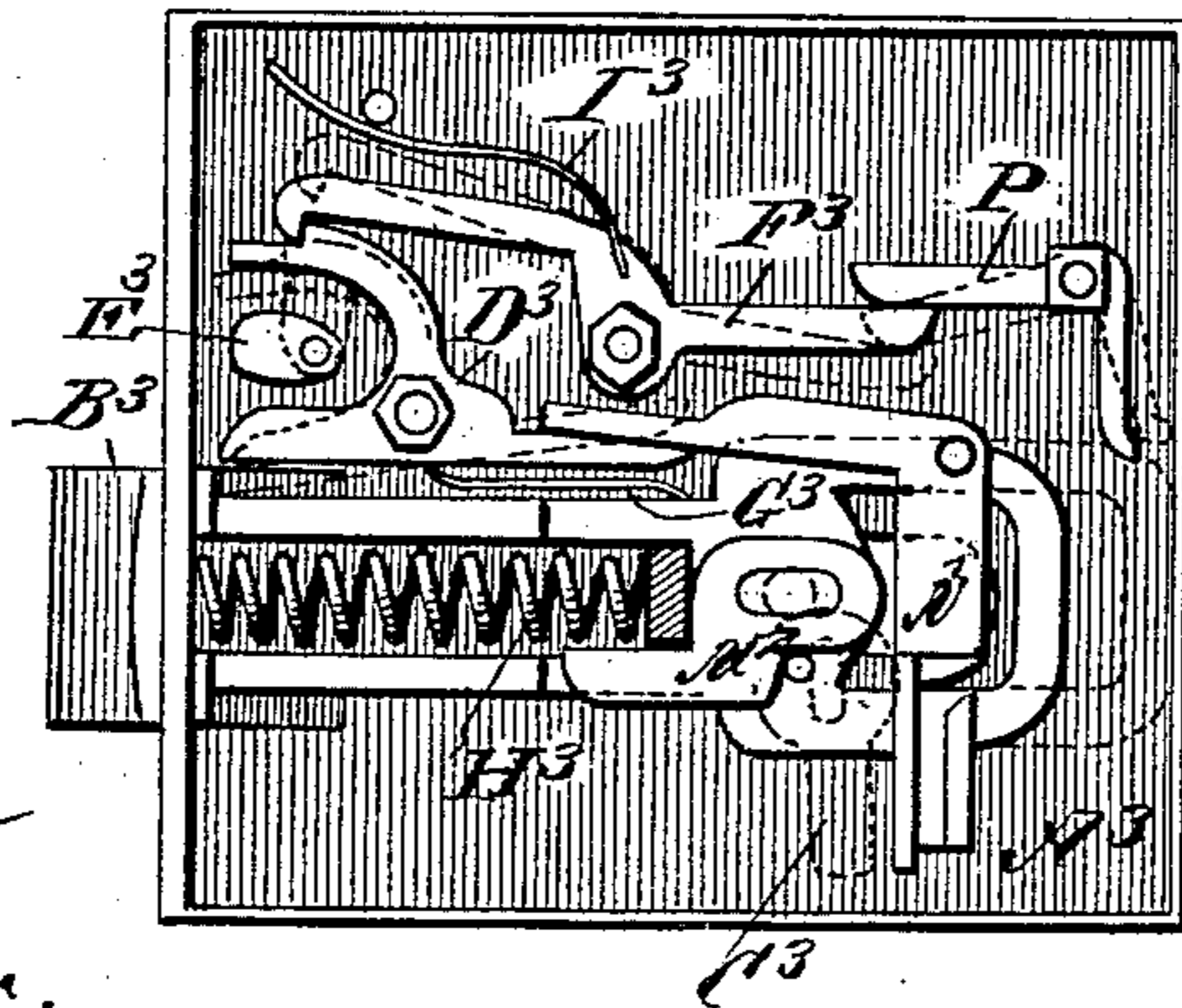


Fig. 5.



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UNITED STATES PATENT OFFICE.

CHARLES BACKER, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO ADA E. RAINES, OF SAME PLACE.

AUTOMATIC DEAD-LATCH LOCK.

SPECIFICATION forming part of Letters Patent No. 632,620, dated September 5, 1899.

Application filed March 16, 1899. Serial No. 709,278. (No model.)

To all whom it may concern:

Be it known that I, CHARLES BACKER, of New York, in the county of New York and State of New York, have invented a new and useful Improvement in Automatic Dead-Latch Locks, of which the following is a specification.

In dead-latch locks it is a great desideratum to prevent the spring-bolt from being forced back by a knife or flat tool inserted in the crack of the door to pry the bolt back. To prevent this, detents have heretofore been provided which drop behind some portion of the bolt to prevent its withdrawal after the door is closed except by a key.

My invention consists in the peculiar construction and arrangement of the parts of a self-adjusting lock of this class, which may be set into operative engagement by the departing person in the act of closing the door, as by the backward movement of the bolt in the act of closing the door behind the departing person, thus rendering the locking-detent automatic, locking the latch behind each individual as he goes out, and yet permitting each individual with his latch-key to open the door when he desires to come in, all as hereinafter fully described with reference to the drawings, in which—

Figure 1 is a front view of a latch-lock, showing a very simple form of my invention. Fig. 2 is a view showing it applied to a Yale latch-lock. Fig. 3 is an inside face view of another form of my dead-latch lock. Fig. 4 is a like view of the same applied to a mortise knob-lock. Fig. 5 shows still another form of the invention.

My invention, it will be understood, may be applied to any kind of a lock employing a spring-latch bolt and opened by a key from the outside.

Referring to Fig. 1, A is the lock-plate, having the usual rigid lug *a* cast on the same and forming the forward stop and guide for the bolt B. H is the usual helical spring, arranged within the slotted shank of the bolt and bearing at one end against the rigid lug *a* and at the other against the head of the bolt. The rear end of the bolt B is formed into two branches provided with outturned or right-angular lugs *b b*. C is the tumbler-arm, such

as is ordinarily attached to the rotary barrel of a Yale lock and which is rotated by the key from the outside. This arm C, however, is in this case fulcrumed in the middle and has an upward branch resting against upper lug *b* of the bolt and a lower branch adapted to bear against the lower lug *b* in retracting the bolt. D is the detent. This is a bar substantially horizontal in position, fulcrumed at *d* and having a spring G bearing against pin *g*, which spring is adapted to throw the detent D down. This detent has a downwardly-projecting portion *z*, which is adapted to be struck by the upper branch of tumbler-arm C to raise the detent about its fulcrum. It also has a tooth *x*, that is adapted to catch behind a shoulder *y* on the bolt and hold the bolt against withdrawal when the detent is down. Under its elevated forward end the detent has a rotary cam E, which is rigidly connected to a thumb-piece on the inner side of the lock. This cam may be turned by the thumb-piece to the position shown in dotted lines to lift the detent into its upper position, where its tooth *x* does not engage the shoulder *y* of the bolt, or said cam may be turned into a horizontal position, as shown, so as to allow the detent to be dropped into operative position by my tripping devices. These tripping devices comprise a vertical catch-lever F, fulcrumed at its lower end and having a beveled head at the top and a swell or projection *f* on its shank portion. A spring I, held by pin *i*, throws the catch-lever toward the bolt and causes its hooked and beveled head to lock over the short end of the detent D and hold its tooth *x* out of engagement with the shoulder *y* of the bolt independently of any other devices.

e is a stop for the cam E.

I will now describe the automatic action of my dead-latch.

The cam E is, as the person goes out, turned up to the dotted position shown, which causes the rear end of the detent to be caught under the beveled head of the catch and tripping-lever F. Immediately after having been so caught the cam E is turned down into the horizontal position, where it will not interfere with the drop of the detent at the right time. Now as the person closes the door be-

hind him in passing out the spring-bolt B, coming in contact with the striker or keeper on the door-jamb, is forced inwardly, and its upper lug *b*, coming in contact with the catch-lever F, trips it, and in removing its upper end from the detent D the latter is by its spring forced down, but does not drop into locking engagement with the bolt until the bolt shoots forward again into its locked position. Then tooth *x* of the detent drops behind the shoulder *y* and effectually locks the bolt, so that it cannot possibly be withdrawn by any tool inserted in the crack of the door. When, however, the person returns and, inserting his key in the barrel which is attached to arm C, rotates the latter in the direction of the arrow, the upper end of arm C first lifts the detent D from behind the bolt, and then the lower end of the arm retracts the bolt. In this action it will be seen that any person leaving the house may lock his latch-bolt without assistance from anybody inside the house, the means whereby this result is attained being principally the tripping devices for the detent, so arranged as to be acted upon by the recession of the bolt in the act of closing the door behind the departing person. This renders the dead-latch automatic for each individual leaving the house without assistance from anybody else. At *t*-in dotted lines is shown the usual abutting arm on the knob-shaft of the bolt, which when the bolt is withdrawn by the knob may be turned so as to abut against the lug *a* and hold the bolt permanently back and out of action.

In Fig. 2, which shows a well-known form of Yale latch-lock, B' is the bolt; H', its spring; C', the tumbler-arm. D' is the detent; G', its spring; F', the tripping-catch; I', its spring; *b'*, a rigid collar on the bolt; L, an elbow-lever connecting the tumbler-arm C with my tripping device, and E' the lifting-cam acting against a vertical lug on the detent. When the cam E' is turned to the horizontal, it lifts detent D' away from its locking position, which detent is in this position caught and retained by the tripping-catch F'. Cam E' is then turned into a vertical position, as in dotted lines, away from the lug on the detent. Now when the door is closed behind the departing person the recession of bolt B' brings its collar *b'* against tripping-catch F' and drops the detent to locking engagement. When the person with the key returns and rotates the barrel carrying tumbler-arm C', this tilts lever L and first lifts the detent D' out of locking engagement, and then, pressing back on the collar *b'* of the bolt, retracts the latter. To hold the bolt B' permanently back, a tilting lever M has one end protruding through a slot on the edge of the lock-case and may be thrown to the dotted position to engage the collar *b'* of the bolt and hold it back when desired.

While in Figs. 1 and 2 the tripping-lever is operated by a direct and instantaneous push of the locking-bolt B B' upon its back-

ward movement in the act of closing the door, in Figs. 3 and 4 the bolt acts on the tripping-lever gradually by riding on an incline.

Referring to Fig. 3, B² is the bolt, which is provided with a longitudinal slot, in which is arranged the helical spring H², that bears at one end against the stationary lug *a'* cast on the back plate and at the other end against the front part of the bolt. The rear end of this bolt is extended upwardly, and on the same is pivoted an elbow-lever N, having a horizontal arm at the top and a vertically-pendent arm adapted to bear against a pin *n* on the bolt. Against the lower arm of the elbow-lever there bears in unlocking the bolt the arm C², (shown in dotted lines,) which is attached to the rotary barrel in which the key is inserted, and by turning which arm C² in the direction of the arrow the bolt may be withdrawn. If desired, the tumbler-arm I may be replaced by a key of ordinary construction with suitable tumblers. Just above the bolt B² there is pivoted to the lock-case at a central point a three-pronged detent D², one prong extending forwardly toward the beveled face of the bolt, the other one backwardly in a straight line, and the third extending upwardly and forwardly. Underneath the detent D² is a small spring G², whose tension tends to throw the forward end of the detent down behind the shoulder of the bolt B². To lift the detent away from the bolt, a cam E² is fixed on a shaft and operated with a rotary adjustment by a thumb-piece on the outside of the lock-case, but from the interior of the house. This cam E² when in vertical position holds the detent up by bearing against its upper prong, as shown in dotted lines, or it may be turned down into a horizontal position, as shown in full lines. In either of its positions it is held stationary by a bearing-spring *e'*. F² is a tripping-lever arranged in substantially horizontal position above the bolt and fulcrumed near the center. This tripping-lever has a catch at its forward end that hooks over the upper prong of the detent, and at its rear end has an upwardly-inclined tail *f'*, that extends under the pin *b*² on the rear end of the lock-bolt. The catch end of the lever is held down and the tail *f'* up by the spring I². The operation of this lock is as follows: When a person goes out of doors, the cam E² is first turned up, as in dotted lines, and then is turned down again, as in full lines. When it is turned up, it raises the front end of the detent D², and the catch of the tripping-lever F² locks behind the end of the upper prong of the detent and holds the detent out of engagement with the bolt after the cam E² is turned down. Now when the door is closed and the bolt B² is forced backward by contact with the keeper on the door-jamb the pin *b*² on the rear end of the bolt rides on inclined tail *f'* of the tripping-lever and forces the same down, releasing its front end from the detent and allowing the latter to fall into position, where when the

bolt goes forward again into the keeper it locks behind the shoulder of the bolt and effectually prevents it from being forced back.

When, however, a person inserts his key from the outside and turns the tumbler-arm C^2 , the latter first strikes the lower member of the elbow-lever N and, deflecting it, brings its upper member down on the rear end of the detent, lifting it out of engagement with the bolt, and following this action the elbow-lever N strikes against the pin n on the bolt and retracts it.

M' is the usual abutment-arm attached to a knob inside the house, which knob may when pulled back be turned so as to throw the arm M' behind the lug a' and hold the bolt permanently retracted, as is commonly done when the dead-latch is not required.

In Fig. 4 the same devices are shown applied to a mortise knob-lock, in which a separate spring-bolt with rotary knob connections is provided.

In both forms illustrated by Figs. 3 and 4 it will be seen that the detent is thrown into operative position by tripping devices acted upon by the backward movement of the bolt in the general manner described with reference to Figs. 1 and 2, but with this difference, that the action is gradual, and may be adjusted to take place at any point in the rearward throw of the bolt by starting the incline of the tailpiece b farther forward or backward, as the case may be.

In Fig. 5 I show another form of my invention, in which substantially the same arrangement of detent, tripping-lever, and unlocking devices are employed, but the bolt acts upon the tripping-lever through the medium of an independent elbow-lever P , the bolt striking in its rearward movement against the lower arm of the elbow-lever P and causing its upper arm to press upon and release the tripping-lever.

A leading feature of distinction in my invention is the direct action of the locking-bolt B upon the tripping-lever F without any intermediate parts or interposed adjustable pieces and also the independent rotary lifting-cam E , arranged in front of the pivot of the detent D and extraneous to the bolt, which accomplishes the results aimed at in a very simple and practical way with a minimum number of parts.

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

1. A dead-latch lock comprising a sliding locking-bolt having a shoulder, a detent pivoted at its rear end and pointing outwardly toward the front edge of the lock, and arranged to engage said shoulder, a separate and independent rotary lifting-cam arranged in front of the pivot of the detent outside of the

locking-bolt for raising said detent to a position of disengagement with said shoulder, and a tripping-lever for retaining the detent in raised position, said tripping-lever being wholly disconnected from the bolt and extraneous thereto, and arranged to be acted upon by the direct contact of the locking-bolt itself in moving inwardly substantially as described.

2. A dead-latch lock comprising a sliding locking-bolt with a shoulder on it, a detent adapted to engage said shoulder, a separate rotary locking-cam for lifting said detent out of engagement with said shoulder and a tripping-lever arranged to catch and hold said detent, said tripping-lever having a portion of the same inclined to the longitudinal path of the locking-bolt and the locking-bolt having a projection adapted to directly but gradually act upon said tripping-lever to cause it to release the detent substantially as described.

3. An automatic dead-latch lock comprising a bolt, a detent for opposing its rearward movement formed of three prongs, one projecting forwardly to engage the bolt, one to the rear, and one projecting upwardly and forwardly, a lifting-cam arranged beneath the upwardly and forwardly projecting prong of the detent, a tripping-lever fulcrumed above the detent and engaging the same and arranged to be operated upon by the bolt, and an elbow-lever fulcrumed to the bolt and having one arm arranged to act on the rear end of the detent and the other to act upon the bolt when deflected by the tumbler-arm, substantially as shown and described.

4. An automatic dead-latch lock, comprising a spring-bolt B^2 with pins b^2 and n , a detent D^2 with spring G^2 , cam E^2 with spring e' , tripping-lever F^2 with inclined tailpiece f' lying under the pin b^2 , spring I^2 arranged to press downwardly the forward end of the tripping-lever, and the elbow-lever N pivoted to the bolt and having one arm arranged above the detent, and the other arranged to receive the pressure of the tumbler-arm and retract the bolt, substantially as and for the purpose described.

5. In a spring-latch lock the combination with the spring-bolt, and the tumbler-arm for withdrawing the same; of the horizontal lever D with projection z and tooth x , the spring G , the lifting-cam E , and the tripping-lever F , with spring I said lever being arranged to catch and hold the detent out of locking position until it is itself tripped by the backward movement of the bolt substantially as shown and described.

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Witnesses:

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JOHN LOTKA.