

(Model.)

2 Sheets--Sheet 1.

H. L. RUSSELL.
Indicator Lock.

No. 232,070.

Patented Sept. 7, 1880.

Fig. 1.

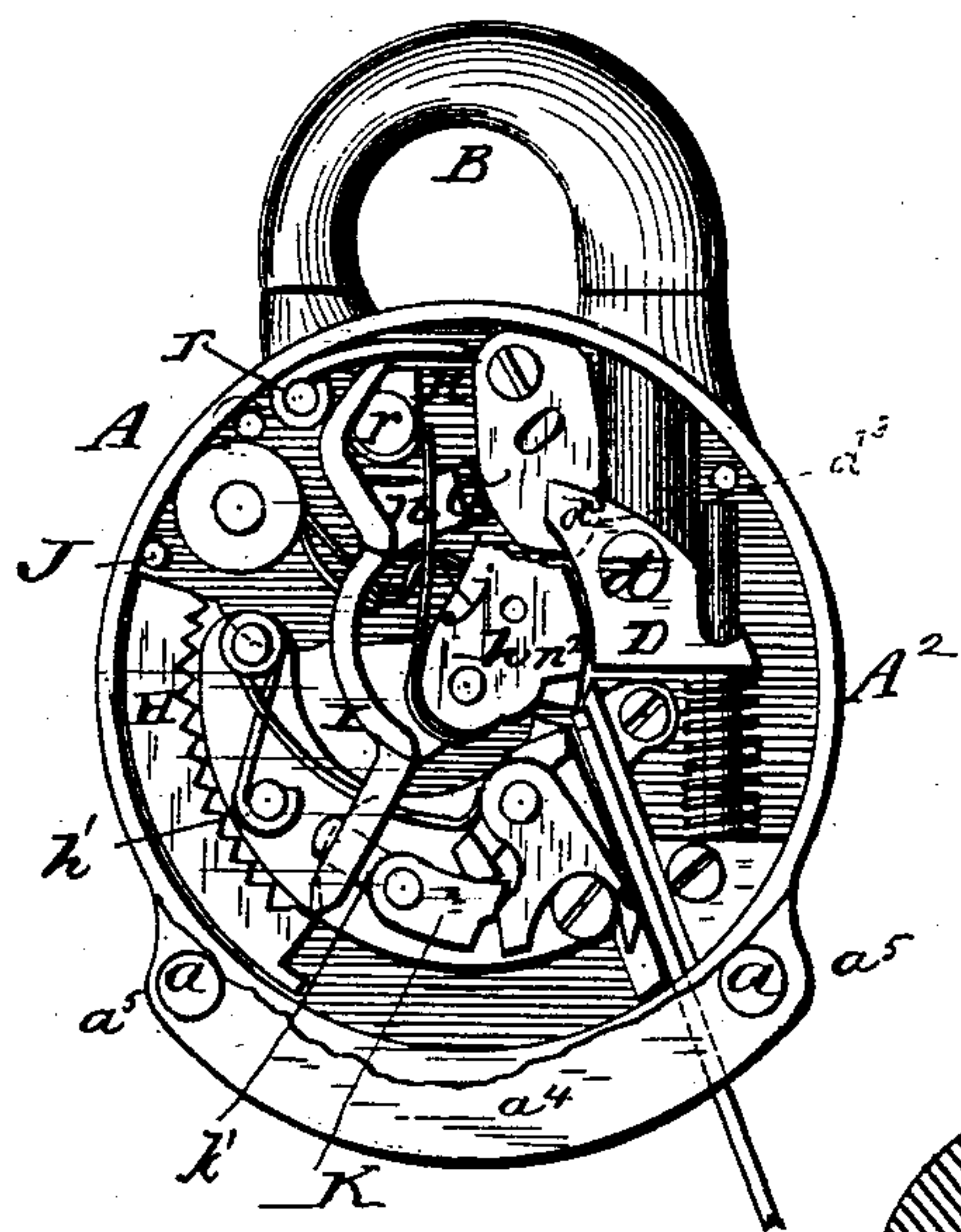


Fig. 2.

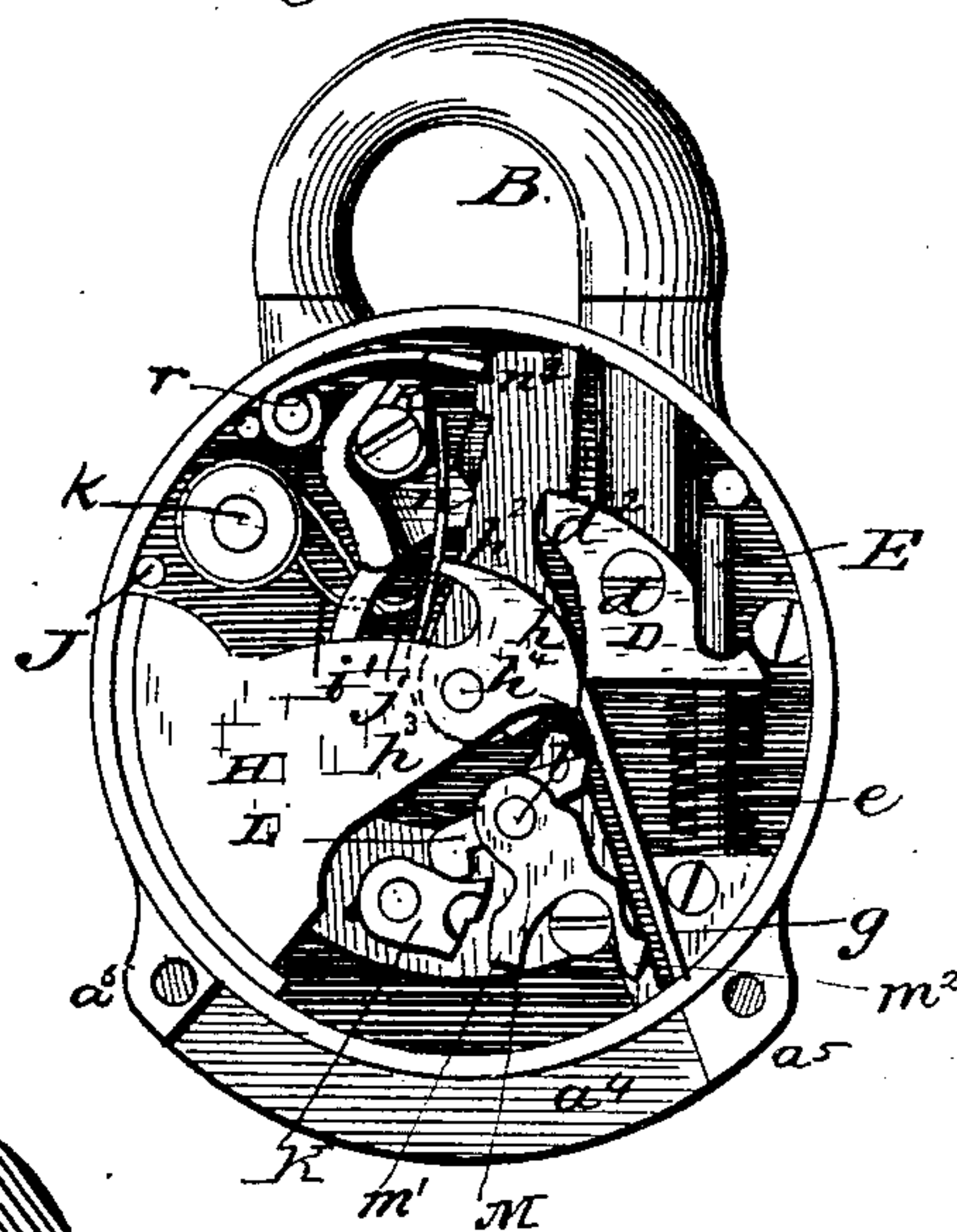


Fig. 13.

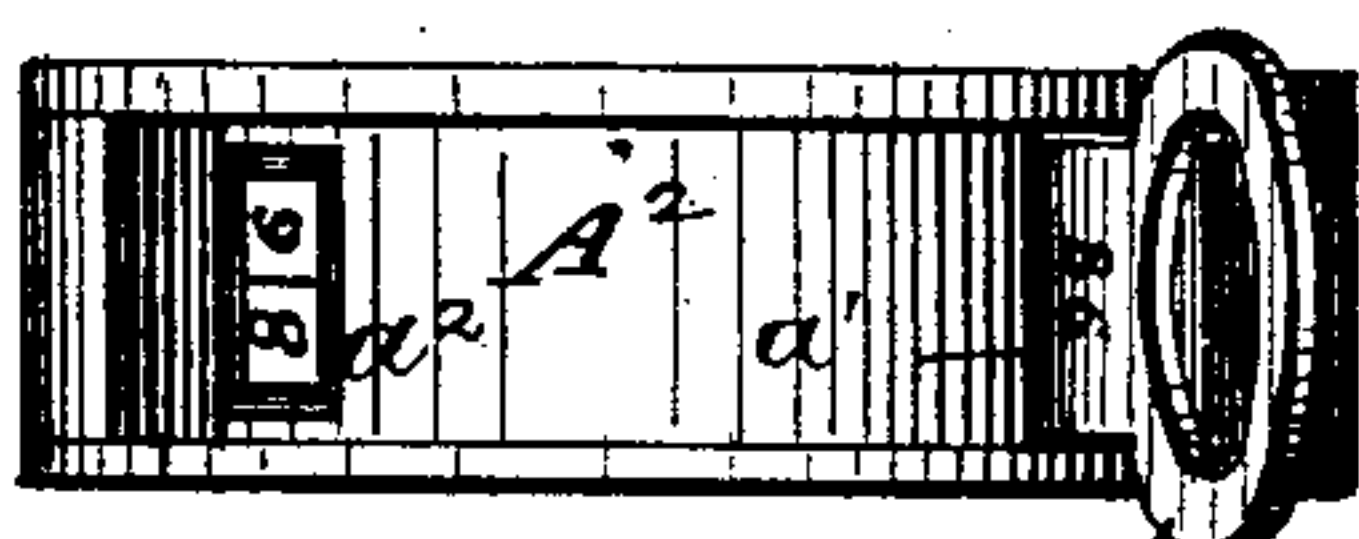
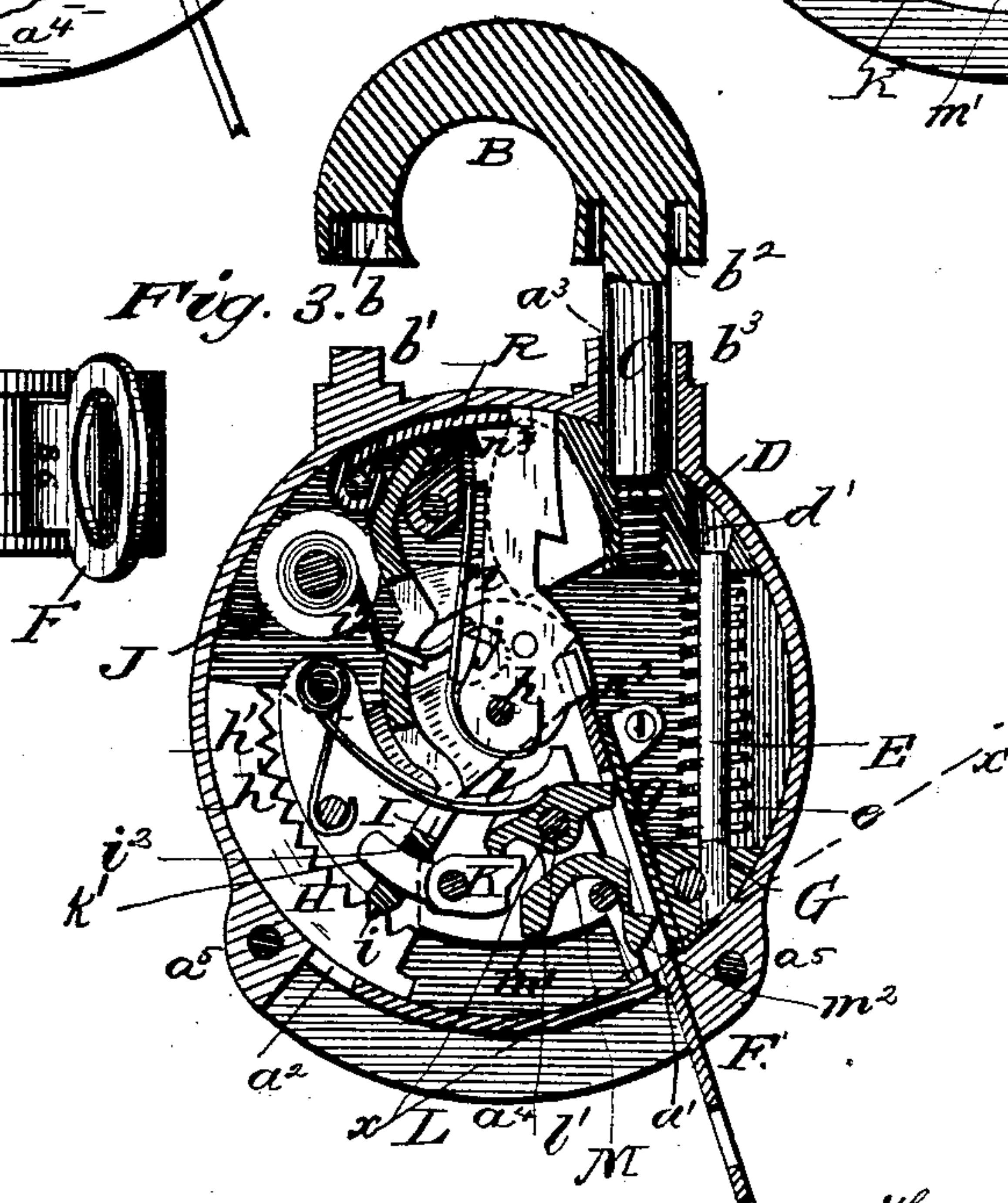


Fig. 3.



witnesses
Fred. G. Dietrich

P. C. Dietrich.

Henry L. Russell

By De Witt C. Allen
att'y

(Model.)

H. L. RUSSELL.
Indicator Lock.

2 Sheets—Sheet 2.

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Fig. 4.

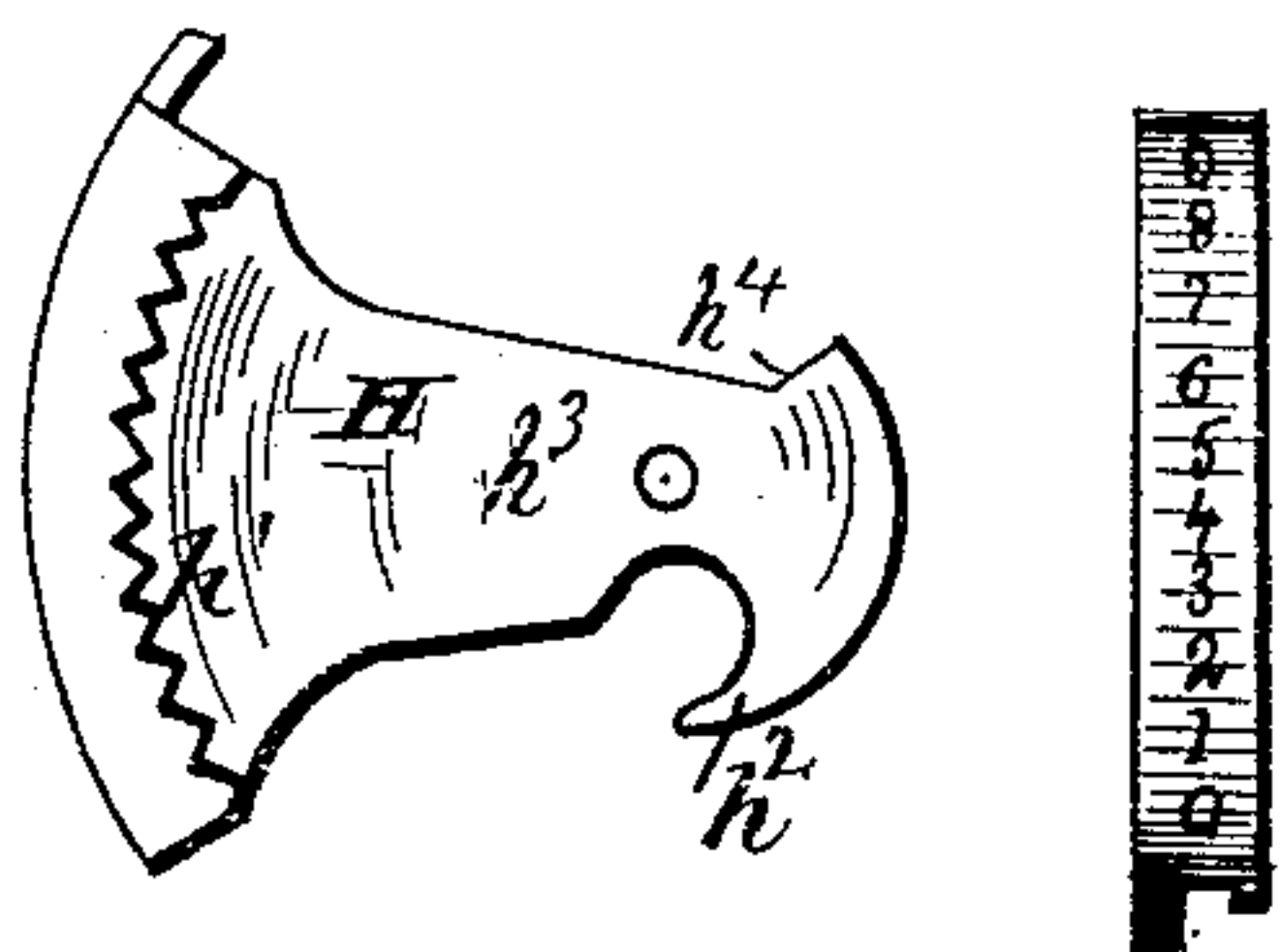


Fig. 5.

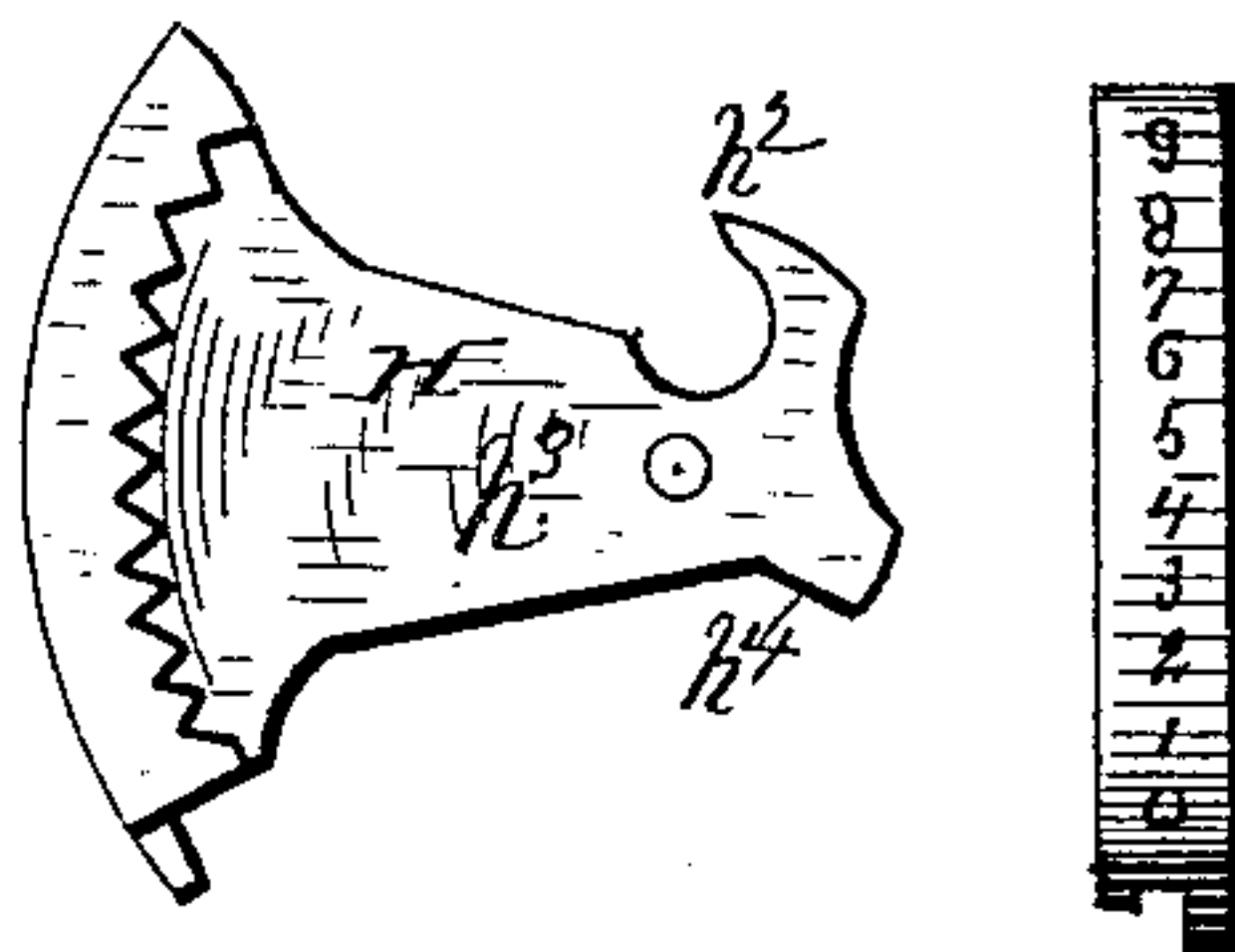


Fig. 6.

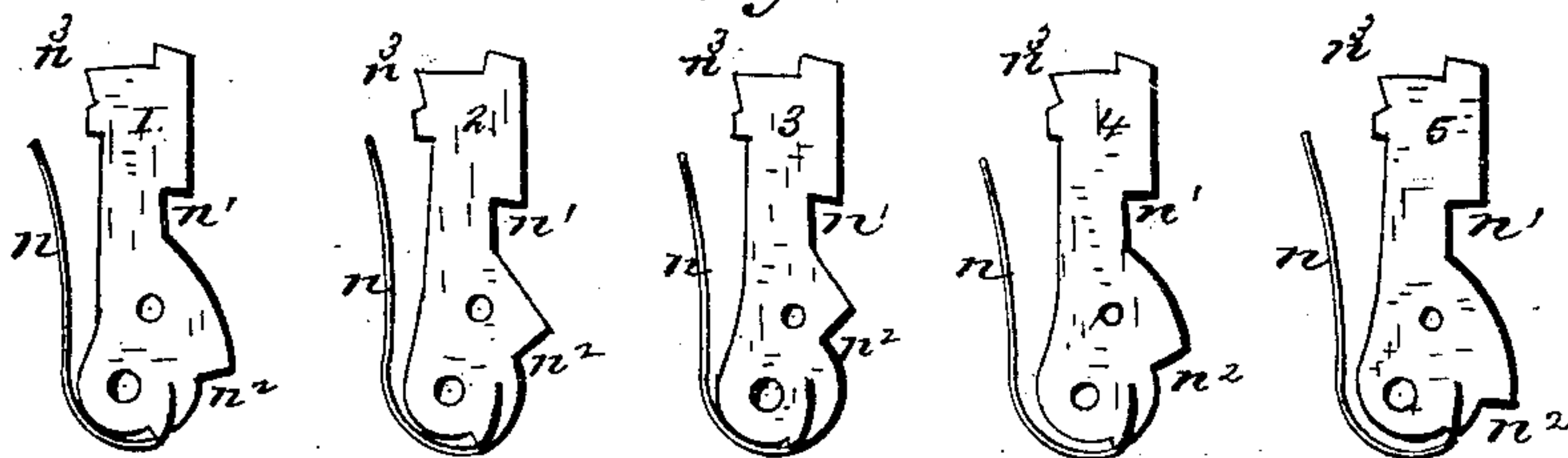


Fig. 7.



Fig. 8.

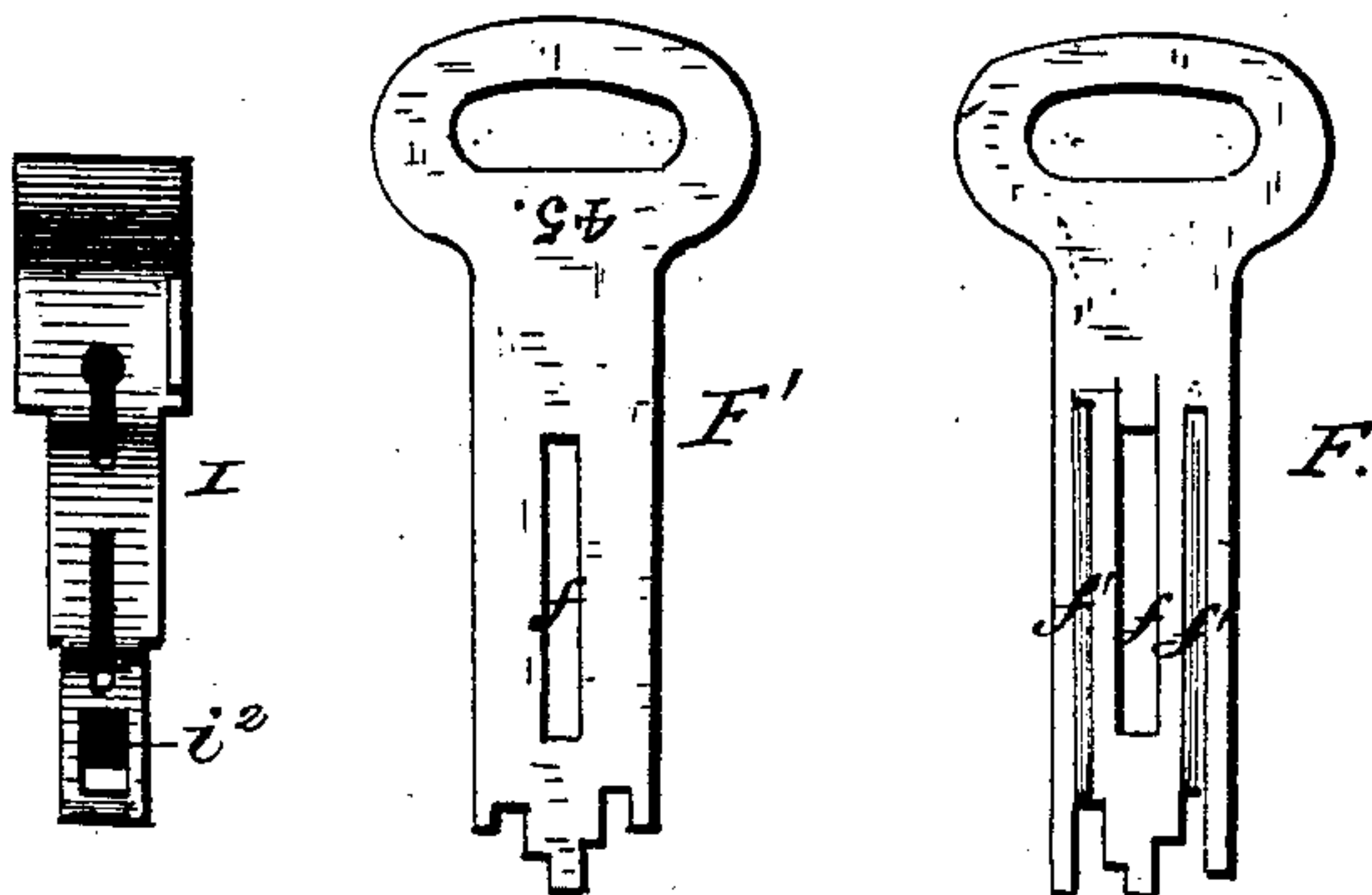


Fig. 9.

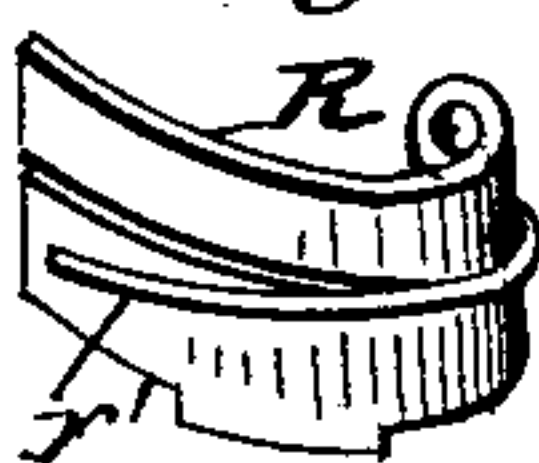


Fig. 10.

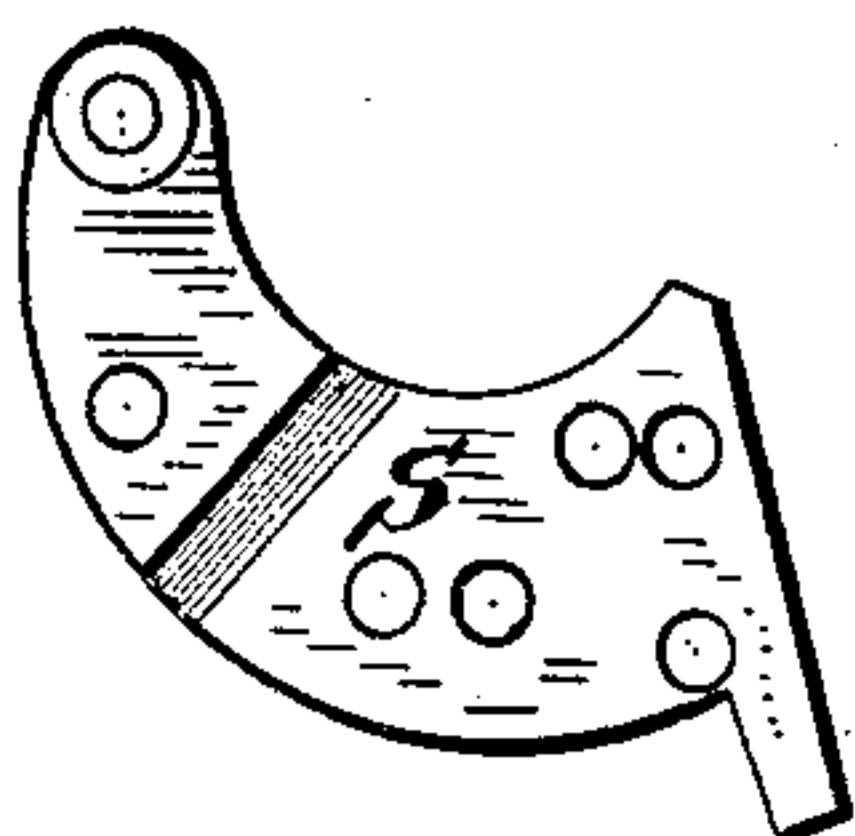


Fig. 11.

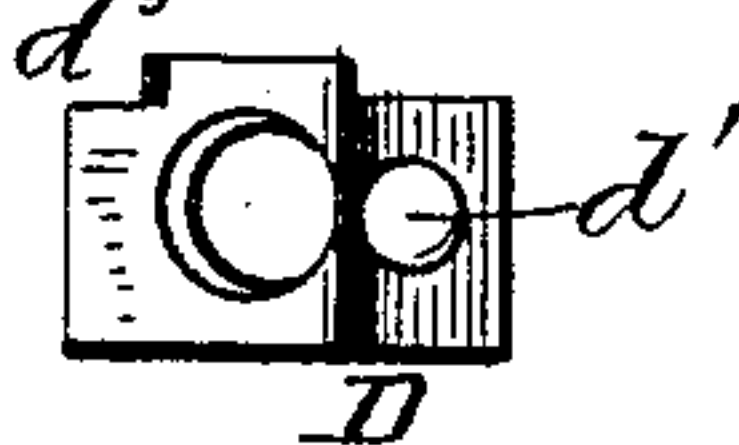
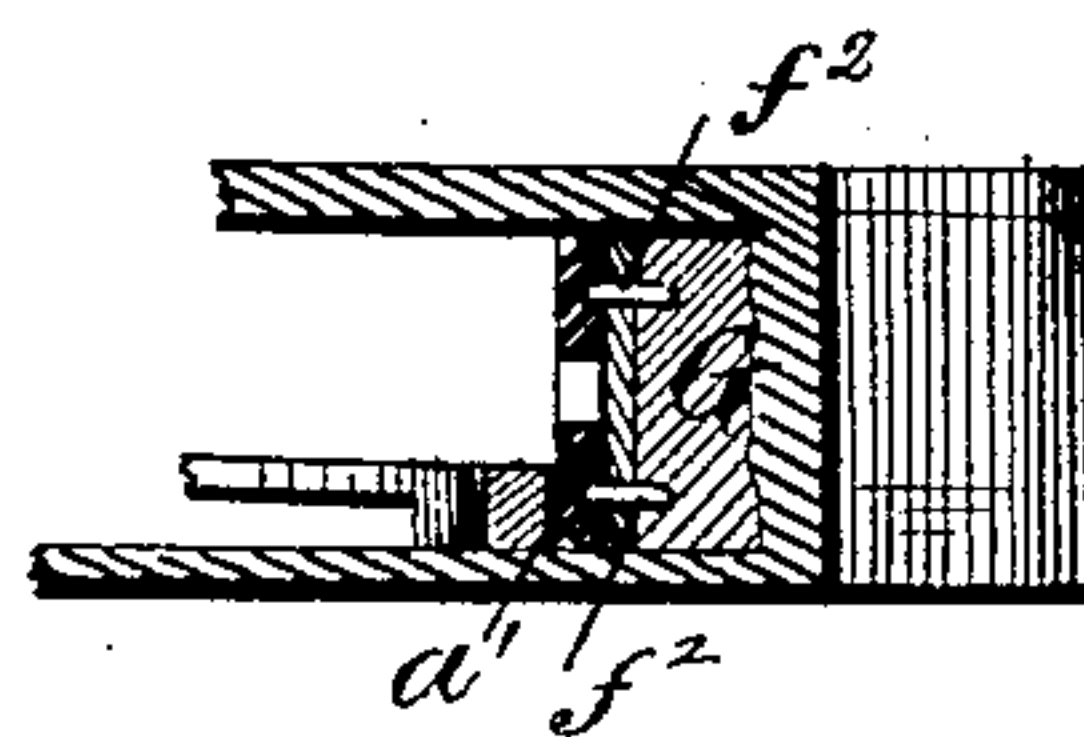


Fig. 12.



Witnesses
Fred. G. Dietrich
P. C. Dietrich.

Fig. 14.



Inventor
Henry L. Russell
by De Witt C. Allen
att'y

UNITED STATES PATENT OFFICE.

HENRY L. RUSSELL, OF BLOOMINGTON, ILLINOIS, ASSIGNOR TO RUSSELL
INDICATOR LOCK COMPANY, OF SAME PLACE.

INDICATOR-LOCK.

SPECIFICATION forming part of Letters Patent No. 232,070, dated September 7, 1880.

Application filed May 19, 1880. (Model.)

To all whom it may concern:

Be it known that I, HENRY LEWIS RUSSELL, a citizen of the United States, residing at Bloomington, in the county of McLean and State of Illinois, have invented certain new and useful Improvements in Indicator-Padlocks, (Case C;) 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to certain new and useful improvements in the class of padlocks employing a sliding shackle; and the object of my invention is to construct such class of locks upon the same principle as the lock for which Letters Patent No. 223,955, were granted to me January 27, 1880, with registering and locking mechanism adapted to be operated by differently formed and numbered keys, that shall indicate or register the number of the key that unlocks it.

My invention also has for its object to render more secure and generally improve such class of locks; and my improvements consist in certain novel combinations of devices and in novel constructions of parts, which will hereinafter specifically be designated.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of my improved lock, showing the position of the parts when a key is partially inserted. Fig. 2 is a plan or face view with one section of the lock-case removed to show the works and interior construction with the parts in the locked positions. Fig. 3 is a vertical section with the parts in the unlocked positions, the key inserted, and the shackle opened; Figs. 4 and 5, side and front views of the registering-tablets; Fig. 6, detail views of the interchangeable tumblers; Fig. 7, side and face views of the dog or detent for locking the registering-tablets; Fig. 8, opposite side views of two of the keys for operating the lock; Fig. 9, detail view of the sentinel-tumbler; Fig. 10, detail view of one of the covering-plates S; Fig. 11, detail view of the block mounted on the

spindle of the shackle, with which the tumblers 1 2 3 4 5 and locking-dog or detent engage; Fig. 12, section through the line *xx* of Fig. 3; Fig. 13, bottom end view of the lock with key inserted; Fig. 14, detached views of the pivoted dogs L and M.

To enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

In the drawings, A represents the lock-case or shell, made in sections, and united by a number of suitably-located rivets, *a*. The bottom or lower side of the rim *A*² of the case or shell has two apertures through it, the aperture *a'* for the insertion of a thrust-key, F, for operating the lock, and the aperture *a*² for observing the numbers or other indicating characters on the faces of the registering-tablets.

B represents a sliding shackle, having an opening, *b*, in its free end, adapted to fit over a boss, *b'*, projecting from the exterior rim of the case or shell when said shackle is closed. The shackle has also an opening, *b*², surrounding the shank or spindle C, and which is adapted to fit over a hollow boss, *b*³, on the exterior rim of the case or shell when the shackle is closed.

The shank or spindle C is rigidly connected to and forms a part of the shackle, and said shank or spindle passes through the hollow boss *b*³ and an opening, *a*³, through the rim of the case or shell, into the interior thereof, and it is provided on its inner or free end with a block, D, in which the end of the shank or spindle is screwed and secured by a set-screw, *d*. This block D is provided with an opening, *d'*, through one side or end thereof, by which it is adapted to be mounted on a stationary spindle, E, having a coiled or spiral spring surrounding it between said block D and the abutment G, in which said spindle E is secured. The object of this spring is to throw or press the shackle open when unlocked.

The abutment G has a projecting vertical side flange, *g*, forming a guide for the key when inserted in the lock for unlocking the shackle.

The registering arrangement in the present instance is composed of two like quadrantal

tablets, H H, pivoted or journaled on the central stud, h , and the curved faces of these tablets fit against the lower inside face of the rim A^2 of the case or shell, so that as said tablets are moved by a key, F, the numbers or other indicating characters on their curved faces will be shown or seen at the aperture a^2 through the bottom of the rim A^2 , as clearly represented in Fig. 13. The inner or concave edges of these tablets H are provided with teeth or serrations h' , with which the toothed end i of an irregularly-shaped dog or detent, I, actuated by a spring, i' , engages for securing said tablets H in any position they may be moved by a key in unlocking the shackle.

The tablets H are held against a stud, J, when in their normal position, so that each tablet presents a blank portion of its curved face at the aperture a^2 , through the medium of their actuating-springs j , mounted on the stud h , and engaging with the projecting hooked ends h^2 of the arms h^3 of the tumblers H, as clearly shown in Fig. 2. The arms h^3 of the tablets are also provided with angular shoulders h^4 , against which the keys of the lock engage for operating or moving them.

The dog or detent I is thrown out of engagement with the registering-tablets through the medium of a pivoted lever, K, having one end, k' , passing through a slot, i^2 , in said dog or detent I, and its opposite end engaging with a pivoted dog, L, actuated by a spring, l , and operated through the medium of a key when inserted in the lock. This dog L is pivoted on a stud, l' , upon which is also pivoted a locking-dog, M, the dog L being arranged in a recess, m , in the dog M, as more clearly shown in Fig. 14. The dog M is provided with an arm or lug, m' , adapted to engage with the lever K, and a hooked lug, m^2 , which engages with a key when partially inserted in the lock, and prevents its withdrawal until the shackle is unlocked.

In the present instance five locking-tumblers, 1, 2, 3, 4, and 5, are used, which are mounted on the central stud, h , in numerical order, and interposed between the arms of the registering-tablets, which are cut away for that purpose. These tumblers are actuated by attached springs n , and are provided with hooked projections n' , that engage with the angular nose d^2 of the block D of the shackle shank or spindle C for locking the shackle B when closed. Each of these tumblers is also provided with a differently-formed shoulder, n^2 , corresponding with the notched ends of the keys for operating them. The shape of these tumblers otherwise is the same, whereby they are adapted to be interchanged, so that in the loss or abstraction of a key a new series of keys can be furnished to correspond with the change of the tumblers, thus effectually preventing the use of any of the original series of keys adapted to unlock or operate the lock, and the extent of the interchanges of these locking-tumblers can be made in accordance

with the computation of the changes of the numbers 1, 2, 3, 4, and 5.

O represents a pivoted locking-dog, operated through the medium of a lug, o , on the sliding or movable dog or detent I. This dog O is thrown and held in engagement with an angular notch, d^3 , on the under side of the block D of the shackle shank or spindle C through the medium of the sliding or movable dog or detent I when thrown out of engagement with the registering mechanism, and in which position it is held for securing the shackle in a closed position until the registering-tablets have been moved by a key to register its number and the locking-tumblers thrown out of engagement with the block D, when the sliding or movable dog or detent I will be thrown into engagement with the registering-tablets through the medium of its actuating-spring, thus releasing the dog O and permitting the spring e to press or throw open the shackle.

$r r$ represent two posts or studs, between which the upper end of the sliding or movable dog or detent I is guided, and which, in its upward movement, when thrown out of engagement with the registering-tablets, forces or throws the pivoted sentinel-tumbler R, actuated by its attached spring r' , out of engagement with the notches n^3 of the locking-tumblers, thus permitting them to be unlocked by the key.

It will thus be observed that when the sliding dog or detent I is out of engagement with the registering-tablets the sentinel-tumbler is out of engagement with the locking-tumblers, while the dog O is thrown and held in engagement with the block D of the shackle shank or spindle, thus preventing the shackle from being unlocked, even if the locking-tumblers were by any means thrown out of engagement with the block D, while the sentinel-tumbler will always hold and prevent the locking-tumblers from being thrown out of engagement with said block D when the sliding dog or detent I is in engagement with the registering-tablets.

Fig. 8 represents opposite side views of two differently-formed keys adapted to operate my improved lock, said keys being provided with a longitudinal central slot, f , through which passes the hooked end m^2 of the dog M upon a partial insertion of a key in the lock, as shown in Fig. 1, thus preventing its withdrawal until inserted far enough to operate the registering mechanism and indicate or register its number through the aperture a^2 , and also unlock the shackle. Each of the keys adapted to operate the lock is provided on its right-hand side with one or two longitudinal grooves, f' , in which fit the guide pin or pins f^2 , projecting from the abutment G just inside the case or shell at the key-hole or aperture a' , thus insuring the insertion of the keys in their right position to operate the lock, as clearly shown in Fig. 12, the numbers or other

indicating characters being stamped or engraved on the keys, so as to come on the left-hand side thereof when inserted in the lock, as clearly shown in Fig. 13. In the present instance the key F is adapted to register its number 98 when operating the lock, (see Fig. 13,) while the key F' is made to register the number 45 in operating the lock. This lock will register all numbers from 1 to 99, and for each number in this range there is provided a separate key, whose application to the lock will invariably register a certain combination of numbers and none other, and each key will have stamped or engraved upon it the number of the combination it will register.

It is obvious that, instead of using numbers or figures for registering the keys, letters or any other indicating characters might be substituted therefor, and also some of the locking-tumblers might be dispensed with, or more locking-tumblers and registering-tablets used, if deemed expedient.

The shackle B, covering the hollow boss b^3 , when closed, excludes rain and dampness from the interior of the case or shell of the lock, while the projecting ends a^4 of the side plates of the case or shell, in connection with the projecting portions a^5 of the rim A^2 , form a shield around that portion of the rim in which are located the apertures a' a^2 , thus also protecting the lower interior portion of the case or shell from rain and dampness when the lock is suspended.

S represents caps or covering-plates arranged between the registering-tablet, above and below the lower end of the dog or detent I, lever K, and pivoted dogs L M, for the purpose of securing said parts in proper position, both of which plates may be dispensed with.

The operation of my improved lock is as follows: All the parts being in their locked positions, as shown in Fig. 2, a key is introduced in the lock, and upon a partial insertion the parts will assume the positions shown in Fig. 1.

As the key is inserted in the lock it engages and moves the dog L, which in its movement throws the hooked lug m^2 of the dog M into the slot f of the key, and at the same time moves the lever K so that it throws the dog or detent I out of engagement with the registering-tablets while said dog or detent I throws the sentinel-tumbler R out of engagement with the locking-tumblers, and also throws and holds the dog O in engagement with the block D of the shackle shank or spindle C, as shown in Fig. 1. In this position of the parts the key is prevented from being withdrawn by the hooked lug m^2 of the dog M, while the shackle is held in its closed position by the dog O, and the sentinel-tumbler out of engagement with the locking-tumblers, so that upon a further insertion of the key it will move the registering-tablets to indicate or register its number at the aperture a^2 and throw the locking-tumblers out of engagement with the block D, while at the same time the dog or detent I

will be thrown into engagement and lock the registering-tablets through the medium of its actuating-spring, and operating the lever K so as to release the dog M, and also release the dog O, thus permitting the key to be withdrawn from the lock and the spring e to press or throw open the shackle. By pressing down the shackle into a closed position it will be again locked by the locking-tumblers and sentinel-tumbler through the medium of their actuating-springs without disturbing the position of the registering-tablets, which are always held in a locked position when the shackle is opened or closed by the dog or detent I, except upon a partial insertion of a key, as before described.

Having thus fully described my invention, I do not wish to be understood as claiming, broadly, in this case locking and registering mechanism adapted to be operated by differently formed and numbered keys, whereby the number of the key used for operating the lock will be indicated or registered, as that is shown in my former patent before referred to; nor do I wish to be understood as claiming, broadly, in this case anything shown and claimed in another patent of mine bearing even date with this patent; but

I claim as new and desire to secure by Letters Patent in this case—

1. In an indicator-padlock, the combination, with a shackle, of one or more pivoted registering-tablets and a series of pivoted and interchangeable locking-tumblers having differently-formed key-shoulders, said tablet or tablets and tumblers being directly operated by any one of a series of differently formed and indicated keys for registering or indicating the particular key used in unlocking the lock, substantially as specified.

2. In an indicator-padlock, the combination, with a shackle, of one or more registering-tablets, a movable dog or detent, I, for engaging with said registering-tablets, and a locking-dog adapted to be thrown into engagement with the block of the shackle shank or spindle through the medium of said dog or detent when thrown out of engagement with the registering-tablets, substantially as and for the purpose specified.

3. In an indicator-padlock, the combination, with a shackle, of one or more registering-tablets, sliding or movable dog or detent I, for engaging with said registering tablet or tablets, sentinel-tumbler R, and one or more locking-tumblers, arranged relatively to each other substantially as and for the purpose specified.

4. In an indicator-lock, the combination, with a shackle, of one or more registering-tablets, sliding or movable dog or detent I, for engaging with said tablet or tablets, locking-dog O, sentinel-tumbler R, and one or more locking-tumblers, substantially as and for the purpose herein shown and described.

5. In an indicator-padlock, the combination, with a shackle, of locking and registering

mechanism adapted to be operated by differently formed and numbered slotted thrust-keys, and means, substantially as described, whereby upon a partial insertion of one of said thrust-
 5 keys in the lock it will be locked therein and prevented from being withdrawn without unlocking the shackle and registering its number, substantially as specified.

6. In an indicator-padlock, the combination,
 10 with locking and registering mechanism, of a pivoted dog, L, pivoted lever K, and pivoted dog M, having hooked lug m^2 , whereby upon the partial insertion of a slotted thrust-key it is prevented from being withdrawn without
 15 registering its number and unlocking the lock, substantially as specified.

7. In an indicator-padlock, the combination of one or more registering-tablets, sliding or movable dog or detent I, for engaging with
 20 said tablets, pivoted lever K, and pivoted dog L, adapted to be operated by the insertion of a key in the lock for unlocking the registering-tablets, substantially as herein shown and described.

25 8. In an indicator-padlock, the combination of one or more registering-tablets, sliding or movable dog or detent I, adapted to engage with said tablets, pivoted lever K, and pivoted

dogs LM, substantially as and for the purpose herein shown and described. 30

9. In an indicator-padlock, the combination, with the shackle, of the locking-dog O, locking tumbler or tumblers, pivoted sentinel-tumbler R, movable or sliding dog or detent I,
 35 one or more registering-tablets, pivoted lever K, and pivoted dog L, substantially as and for the purpose herein shown and described.

10. In an indicator-padlock, the combination, with a shackle, of one or more locking-tumblers, locking-dog O, sentinel-tumbler R,
 40 sliding or movable dog or detent I, one or more registering-tablets, pivoted lever K, and pivoted dogs L M, substantially as and for the purpose herein shown and described.

11. In a padlock, the case or shell having
 45 side plates, with extensions a^4 a^4 , and the rim having exterior projecting portions a^5 , forming a shield around that portion of the rim A^2 containing the apertures $a' a^2$, substantially as and
 50 for the purpose herein shown and described.

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

HENRY LEWIS RUSSELL.

Witnesses:

DE WITT C. ALLEN,
 ALBERT H. KRAUSE.