

(No Model.)

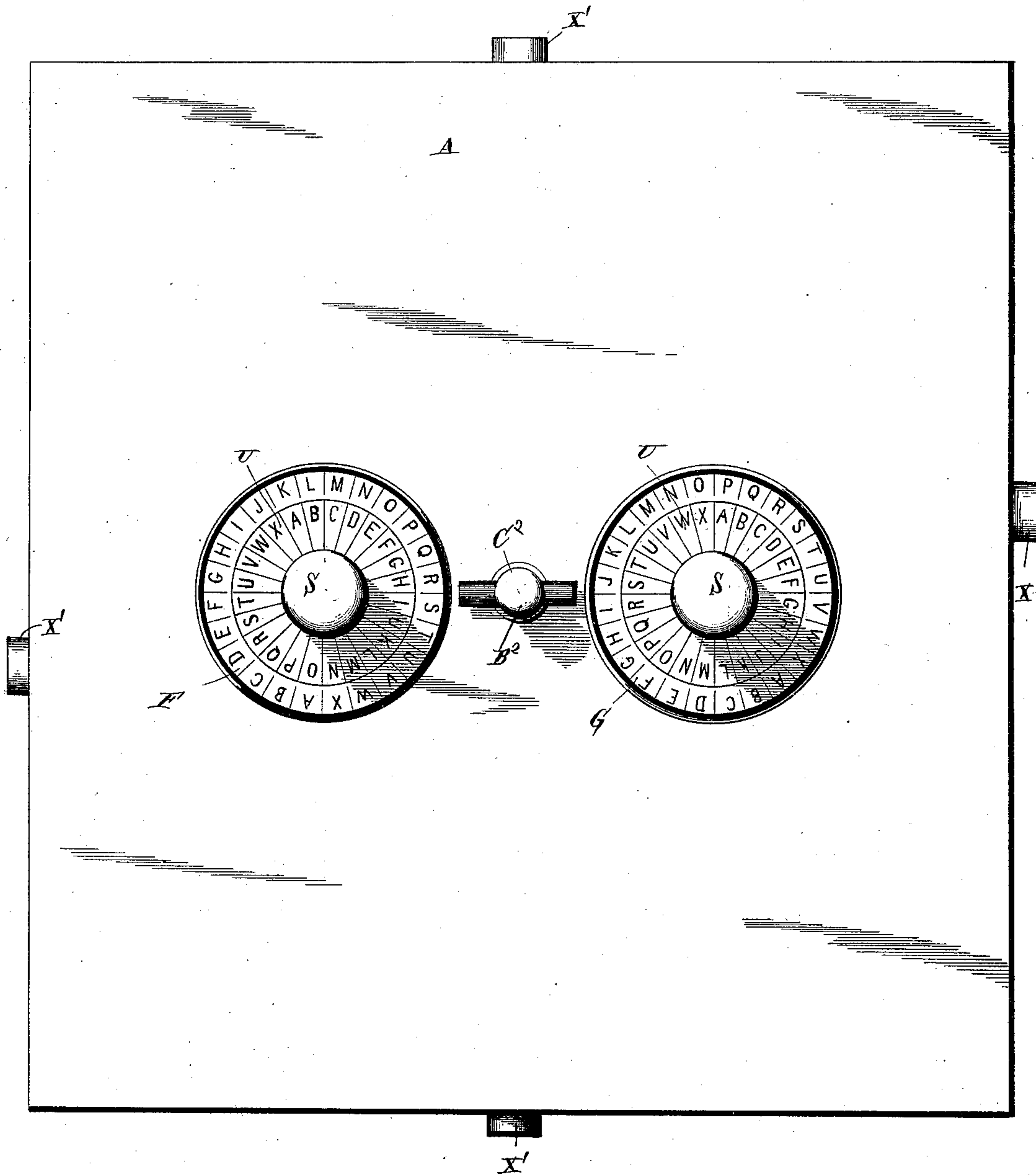
3 Sheets—Sheet 1.

J. BERGMAN.  
COMBINATION LOCK.

No. 381,903.

Patented May 1, 1888.

*Fig. 1.*



Witnesses.

*C. B. Taylor,*  
*J. W. Garner*

Inventor.

*John Bergman,*

By *his* Attorneys.

*C. A. Shaw & Co.*

(No Model.)

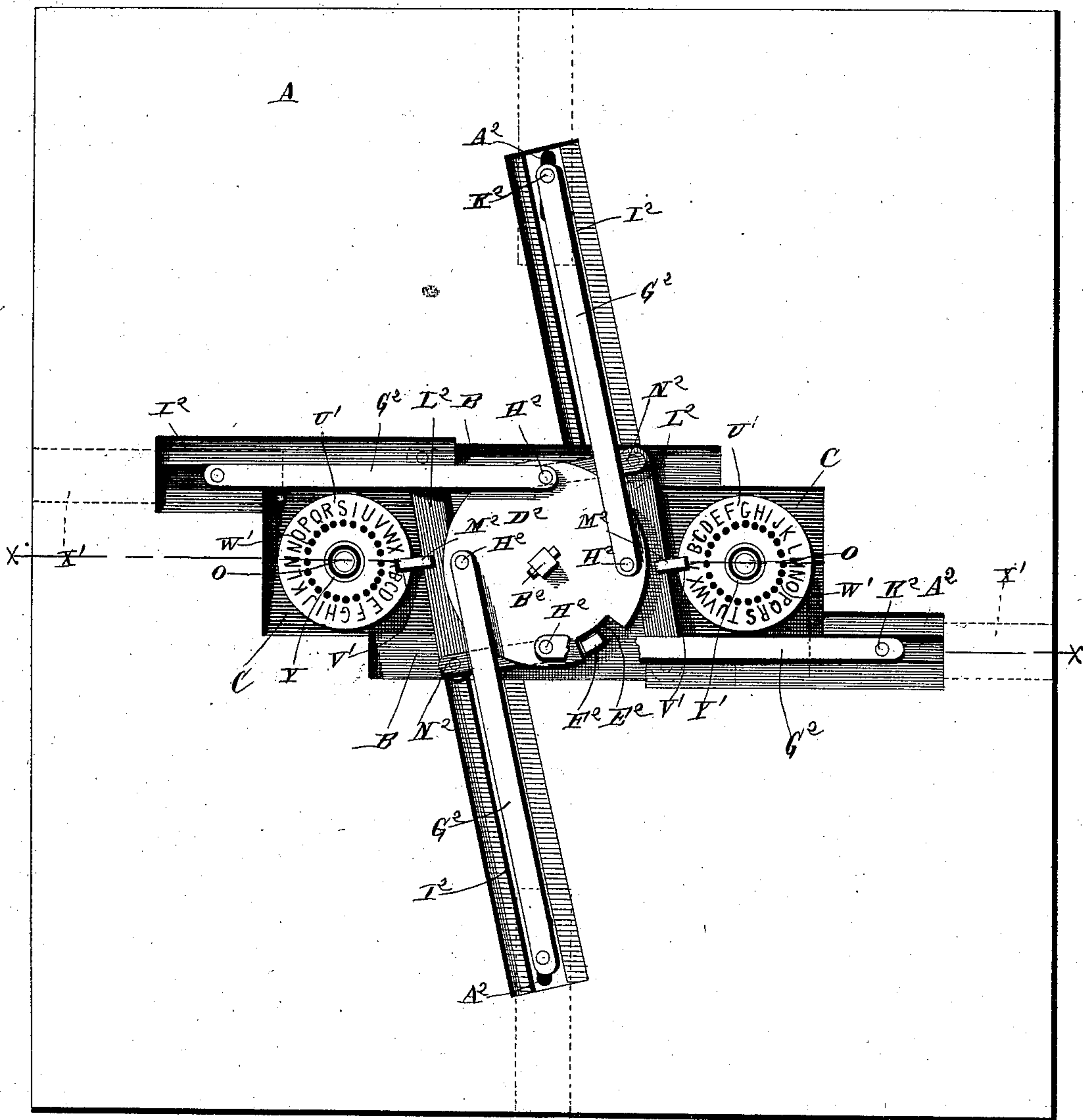
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*Fig. 2.*



Witnesses.

*C. B. Taylor,*  
*J. W. Garner*

Inventor.

*John Bergman,*

By *his* Attorneys.

*C. A. Snow & Co.*

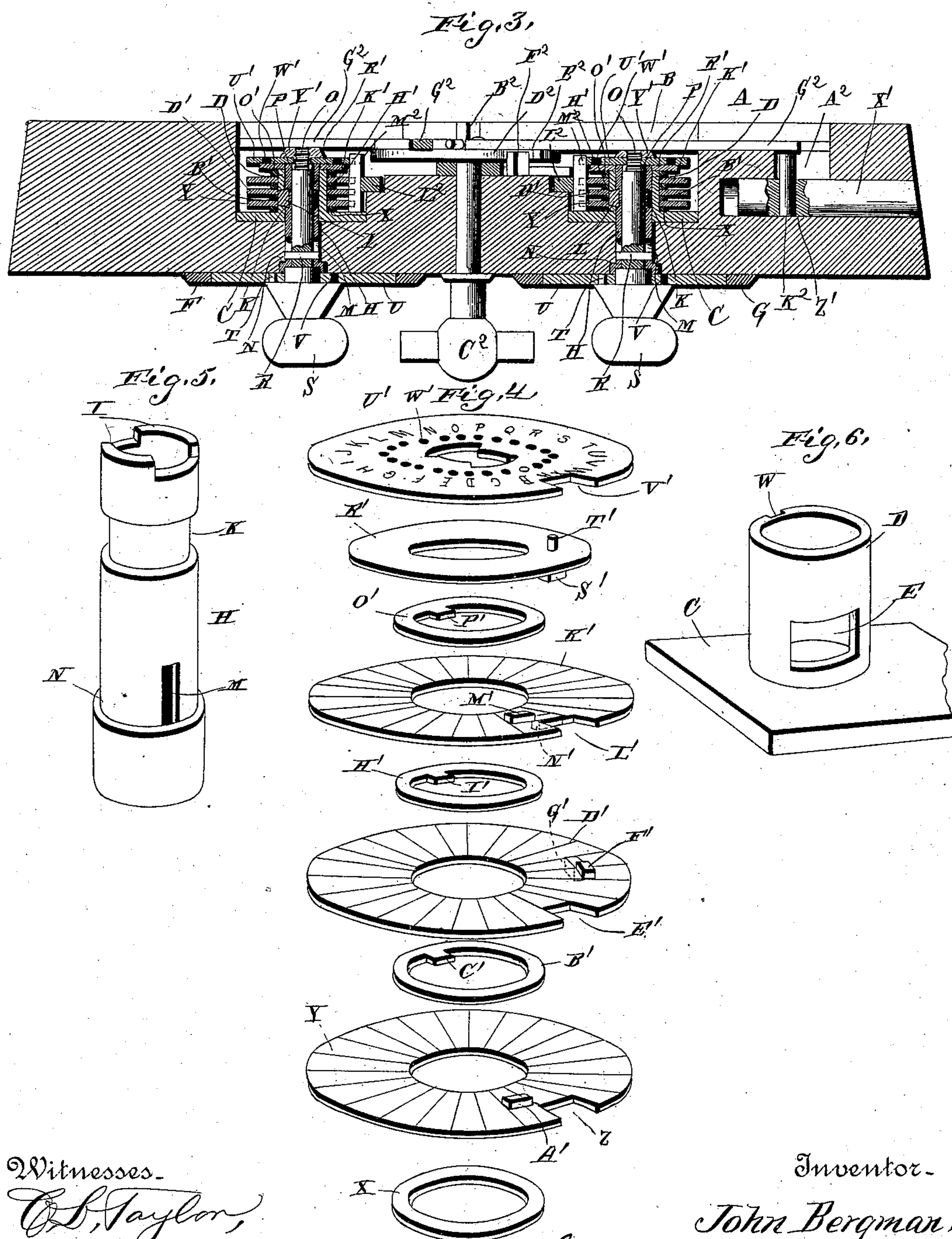
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*C. B. Taylor,*  
*J. W. Garner*

Inventor.  
*John Bergman,*  
By *his* Attorneys,  
*C. A. Howells.*



# UNITED STATES PATENT OFFICE.

JOHN BERGMAN, OF GALVESTON, TEXAS.

## COMBINATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 381,903, dated May 1, 1888.

Application filed January 5, 1888. Serial No. 259,817. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN BERGMAN, a citizen of the United States, residing at Galveston, in the county of Galveston and State of Texas, have invented a new and useful Improvement in Combination-Locks, of which the following is a specification.

My invention relates to an improvement in combination-locks; and it consists in the peculiar construction and combination of devices, that will be more fully set forth hereinafter, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is an elevation of the front side of a safe-door provided with a combination-lock embodying my improvements. Fig. 2 is a similar view of the inner side of the safe-door. Fig. 3 is a sectional view taken on the line *xx* of Fig. 2. Fig. 4 is a perspective view of the series of tumblers and washers detached from one of the knob-spindles. Fig. 5 is a detail view of the inner sleeve, H. Fig. 6 is a detail view of the outer sleeve.

A represents the safe-door, on the inner side of which, at its center, is a recess, B, of suitable size, shape, and depth. In opposite ends of the recess B are secured rectangular plates C, from the inner sides of which, near their centers, project cylindrical sleeves D, each of which is provided on one side with an opening, E. Openings are made through the safe-door coincident with the bores of the sleeve, and on the outer side of the safe-door and arranged concentric with the said openings are annular dials F G, which are provided each with a series of combination letters or figures, as shown.

In each sleeve D is fitted an interior sleeve, H, each sleeve H having studs I at its inner end and being provided with an annular groove, K, which is adapted to coincide with the opening E in the sleeve D, and a key, L, is secured in said opening and engages said annular groove and serves to swivel each interior sleeve in the exterior sleeve, D. Near the outer end of each sleeve H, on opposite sides of the same, are slots M, which extend longitudinally for a suitable distance, and the outer end of each sleeve H is further provided with a shoulder, N.

O represents a pair of knob-spindles, which are arranged in and extend through the sleeves H and have their inner ends reduced to form shoulders P, which are screw-threaded and are provided with transverse pins R, which extend through the spindles and enter the slots M in sleeves H, thereby adapting the knob-spindles to play longitudinally in the sleeves and causing the said sleeves to rotate when the knob-spindles are turned. On the outer end of the knob-spindles are knobs S, and from the inner side of each knob projects a stud, T.

U represents a pair of sign-disks, which are circular in shape, are fitted loosely on the outer ends of the knob-spindles, and adapted to bear against the inner sides of the knobs. The said sign-disks are provided on their faces near their perimeters with a number of sign letters or figures which correspond with the combination letters or figures on the dials F G. Concentric with their central openings the sign-disks are provided with openings V, which correspond with the sign letters or figures of said disks, and each of the said openings is adapted to receive the stud T of the knob, so that the sign-disks may be attached to the knobs at any desired point to enable the combination to be changed, as will appear hereinafter.

It will be understood that the outer sleeves, D, being rigidly secured to the plates C, are rigid, and that the interior sleeves, H, which are secured to the knob-spindles, are adapted to rotate with said knob spindles in the outer sleeves, D. The latter are each provided on one side with a groove, W.

X represents an annular washer, which fits over each sleeve D and bears against the inner side of the plate C. The said washers are loose on the sleeves. Y represents a pair of circular tumblers, which are fitted loosely on the sleeves D and bear against the washers X. The said tumblers are each provided at one side with a notch, Z, and at a suitable distance from the said notch is a stud, A', which projects from the inner side of the tumbler.

B' represents a pair of annular washers, which are fitted on the sleeves D, bear against the inner sides of the tumblers Y, and are provided with inwardly-extending studs C', which



engage the grooves W of sleeves D, and thereby secure said washers against rotation on the sleeves.

D' represents a pair of circular tumblers, which are fitted loosely on the sleeves D, bear against the inner sides of the washers B', are provided in one side each with a notch, E', and are provided on opposite sides with projecting studs F' and G', the said studs being slightly out of line with each other, and being beyond the radius of the washers on the sleeves. The studs G' project outward toward the tumblers Y, and are adapted to come in contact with the studs A' of tumblers Y when the tumblers D' are rotated.

H' represents a pair of annular washers, which are similar to the washers B', are fitted on the sleeves D, bear against the inner sides of the tumblers D', and are provided with inward-extending studs I', which engage the grooves W of the sleeves D, and thereby lock the said washers to the said sleeves.

K' represents a pair of circular tumblers, which are similar to those already described, are fitted loosely on the sleeves D, bear against the inner sides of the washers H', are provided each in one side with a recess or notch, L', and have studs M' and N' projecting from their opposite faces. The studs N' extend inward toward the tumblers D', and are adapted to engage the studs F' of said tumblers when the tumblers K' are rotated.

O' represents a pair of annular washers, which are similar to the washers B' and H', are fitted on the sleeves D, bear against the inner sides of the tumblers K', and are provided with inwardly-extending studs P', which engage the grooves W of sleeves D, and thereby prevent the washers O' from turning.

R' represents a pair of annular rings, which are of greater radius than the washers, are fitted loosely on the sleeves D, bear against the washers O', are provided on their outer sides each with a stud, S', adapted to engage the stud M' of the approximate tumbler K', and are each provided on their inner sides with a projecting stud, T', the said studs T' being in line with the studs S'. The inner sides of the said rings R' are flush with the inner ends of the sleeves D.

U' represents a pair of sign-tumblers, which are similar in size and shape to the tumblers already described, and are each provided at one side with a notch or recess, V'. At the centers of the said sign-tumblers are openings, which are adapted to fit the projecting lugs I at the inner ends of the sleeves H, so that the said sign-tumblers are rigidly secured to the said interior sleeves, and are thereby adapted to turn when the knob-spindles are rotated. The said sign-tumblers are further provided each with a radial series of letters or figures corresponding with those on the sign and combination dials, and in line with the said figures or numbers are a series of openings, W', each of which is adapted to receive the stud T' of

the approximate ring R', and thereby secure the said ring to the said sign-tumbler.

Nuts Y' are screwed to the inner ends of the knob-spindles and bear against the inner side of the sign-tumblers, and thereby serve to keep the said sign-tumblers in engagement with the lugs of the inner sleeves, and also keep these series of tumblers, rings, and washers in place on the sleeves D.

It will be readily understood from the foregoing description that the sign-tumblers are adapted to be adjusted with relation to the rings R', so as to correspond with the adjustment of the sign disks or dials on the knob-spindles, and that by turning the knob spindles first in one direction a suitable distance and then in the contrary direction a suitable number of times the tumblers may be all ranged in such a position that the notches in their edges will register, as shown in Fig. 3.

X' represents a series of bolts, which are fitted in radial openings in the door, the said openings extending to the outer edges of the said door. Near the inner ends of the said bolts are openings Z', and in the inner sides of the door are made slots A', which communicate with the inner ends of the openings in which the bolt operates. In the center of the door is journaled a spindle, B', having a handle, C', at its outer end, and a disk, D', secured to its inner end. The said disk has in one side a notch, E', of suitable length, and from the inner side of the recess B of the door projects a stud, F', which engages the notch E', and consequently limits the rotary motion of the spindle B' and disk D'.

G' represents a series of arms, which have their inner ends pivoted to the inner sides of the disk D' by means of pins H', and the outer portion of said arms are fitted in radial recesses or grooves I', which are made in the door and communicate with the recess B and with the slots A'. From the outer ends of the said arms G' project pins K', which work in the slots A' and enter the openings Z' at the inner ends of the bolts. By this means the bolts are connected to the central spindle, B', so that they may be either withdrawn or extended beyond the sides of the door by partly turning the said central spindle.

L' represents a pair of arms or detents, which have their upper ends pivoted in the recess B at a suitable distance from the inner side of the knob-spindle and extended across the inner sides of the tumblers. The said detent-arms are provided on their outer edges with lugs M', which are adapted to engage the notches in the tumblers when the latter are turned to the position before described and represented in Fig. 2. The free ends of the detent-arms are connected to the disk D' by means of links N', so that when the central spindle is turned to cause the disk to move the bolts outward the detent-arms will be drawn inward, so as to release the lugs M' from the notches in the tumblers, and when the said



central spindle is turned to cause the bolts to be withdrawn the detent-arms will be moved outward, so as to cause their lugs  $M^2$  to enter the notches in the tumblers, the door, when the lock is thus arranged, being free to be opened or closed.

Having described my invention, I claim—

1. The combination of the knob-spindle, the inner sleeve secured thereto and having the spindle movable longitudinally thereon, the sign disk or dial loose on the outer end of the spindle and adjustably secured to the knob, the loose tumblers and ring, and the sign-tumbler rigid with the inner end of the inner sleeve and adjustably secured to the ring, substantially as described.

2. The combination of the door, the bolts, the central disk, the arms connecting the bolts thereto, the pivoted detent-arms, the links connecting the same to the central disk, and the knob-spindles on opposite sides of the central disk and having the tumblers provided with notches adapted to be engaged by the detent-arms to lock the central disk, substantially as described.

3. The combination of the door having the rigid outer sleeve, the inner sleeve therein, the knob-spindle secured to the inner sleeve and movable longitudinally therein, the sign-disk loose on the outer end of the spindle and having the series of openings, the knob having the stud to engage one of said openings, the tumblers and ring loose on the outer sleeve, and the sign-tumbler rigid on the inner end of the inner sleeve and adjustably secured to the ring, substantially as described.

4. The combination of the door having the rigid outer sleeve, the knob-spindle, the tumblers loose on the rigid sleeve, the washers between the tumblers and rigid with the said sleeve, the ring loose on the sleeve, and the sign-tumbler revoluble with the spindle, said tumblers and ring having the studs adapted to engage each other, and thereby cause the tumblers to turn when the spindle is rotated, substantially as described.

5. The combination of the bolts  $X'$ , the disk  $D^2$ , the arms connecting the bolts to the disk, the detents  $L^2$ , having lugs  $M^2$ , the links  $N^2$ , connecting said detents to the disk, and the combination-locks having the notched tumblers adapted to be engaged by the lugs  $M^2$ ,

for the purpose set forth, substantially as described.

6. In combination with the rigid sleeve D, the inner sleeve, H, swiveled thereto, the knob-spindle movable longitudinally in the sleeve H and independent thereof, but also having a connection with the inner sleeve, whereby said inner sleeve is rotated, the sign-tumbler  $U'$ , revoluble with the sleeve H, and the tumblers mounted on the outer sleeve, D, and adapted to be turned by the sign-tumblers  $U'$ , as set forth.

7. In combination with the rigid sleeve D, the inner sleeve, H, swiveled thereto, the knob-spindle movable longitudinally in the sleeve H and independent thereof, but also having a connection with the inner sleeve, whereby said inner sleeve is rotated, the sign-tumblers  $U'$ , revoluble with the sleeve H, and the tumblers mounted on the outer sleeve, D, and adapted to be turned by the sign-tumblers  $U'$ , and the sign disk or dial U, loose on the spindle and adjustably secured to the knob, the sign-disk being adjusted to correspond with the sign-tumbler.

8. In combination with the outer rigid sleeve, D, the tumblers and washers thereon, said washers being rigidly fitted to the sleeve, and the tumblers being in engagement with one another, the ring  $R'$ , in engagement with the tumblers, the inner swiveled sleeve, H, the sign-tumbler  $U'$ , rigidly fixed to the sleeve H, the adjustable connection between the tumbler  $U'$  and the ring  $R'$ , the knob-spindle movable longitudinally within the inner sleeve, and also adapted to turn the latter, and the sign-disk U, loose on the knob-spindle and having an adjustable connection therewith, the adjustable connection between the disk U and the knob-spindle corresponding with the adjustable connection between the ring  $R'$  and the sign-tumbler  $U'$ , as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JNO. <sup>his</sup> × BERGMAN.  
mark

Witnesses:

THOS. L. CROSS,  
J. R. CLOTHIER.