

C. W. BECK.  
AUTOMATIC DOOR REGISTER.

No. 412,588.

Patented Oct. 8, 1889.

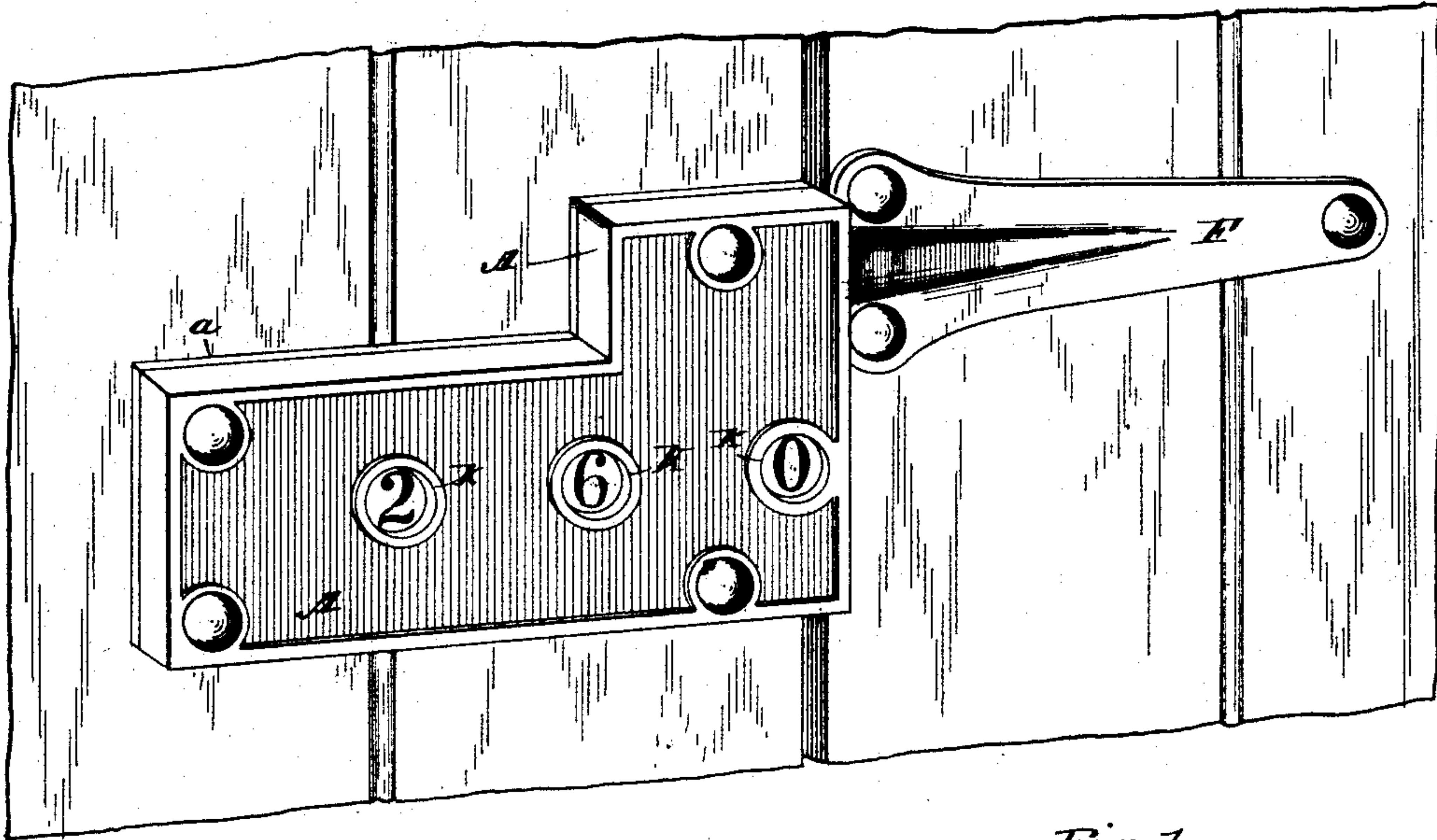


Fig. 1.

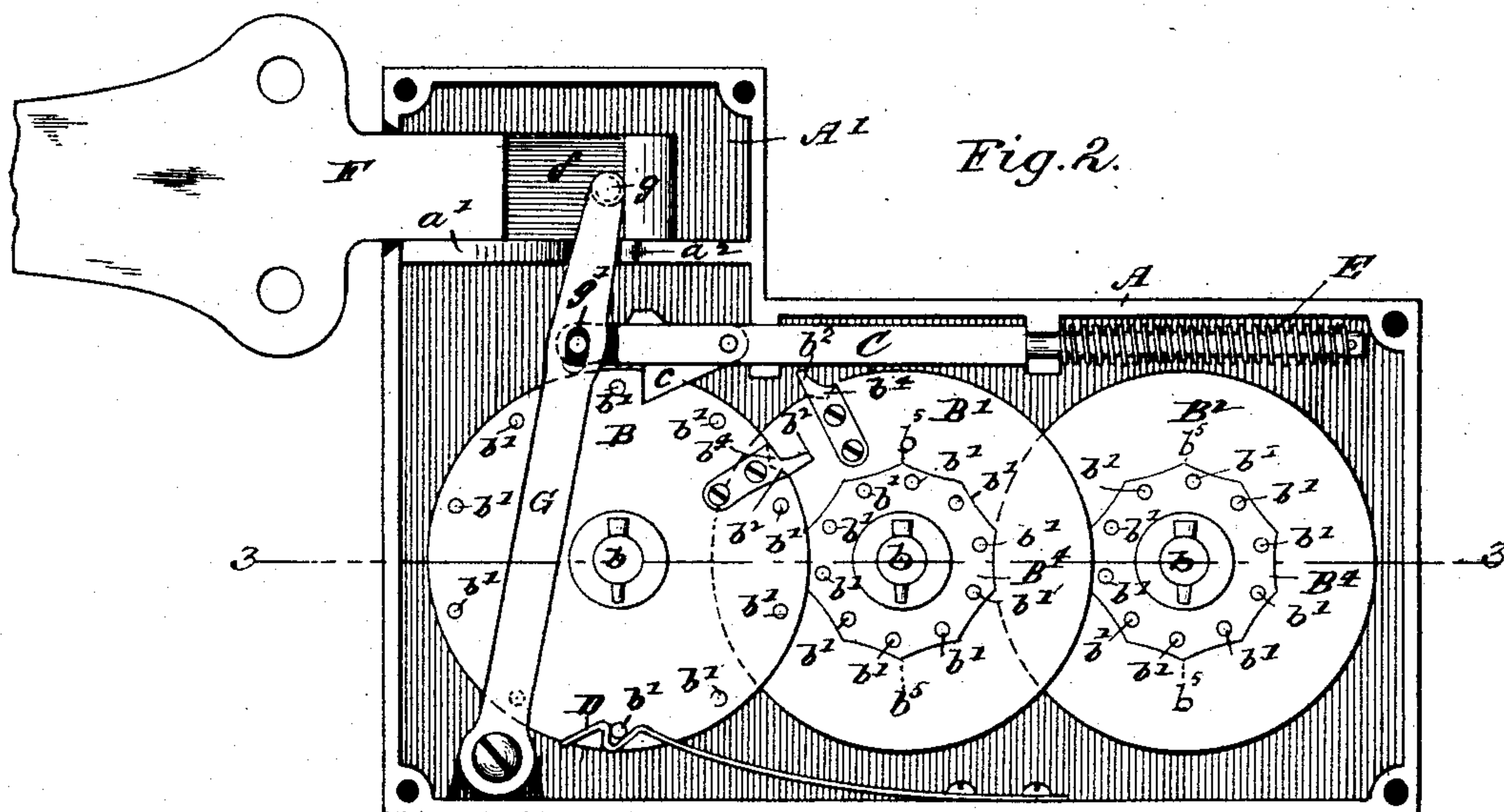


Fig. 2.

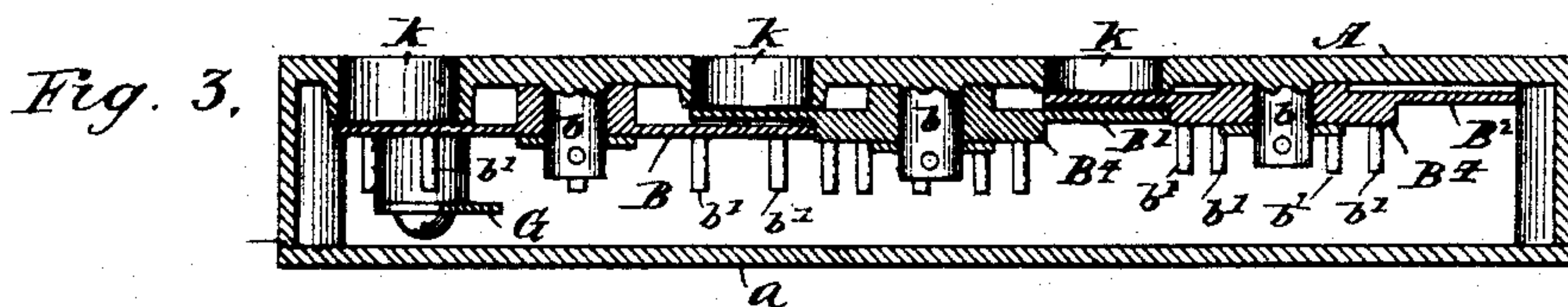


Fig. 3.

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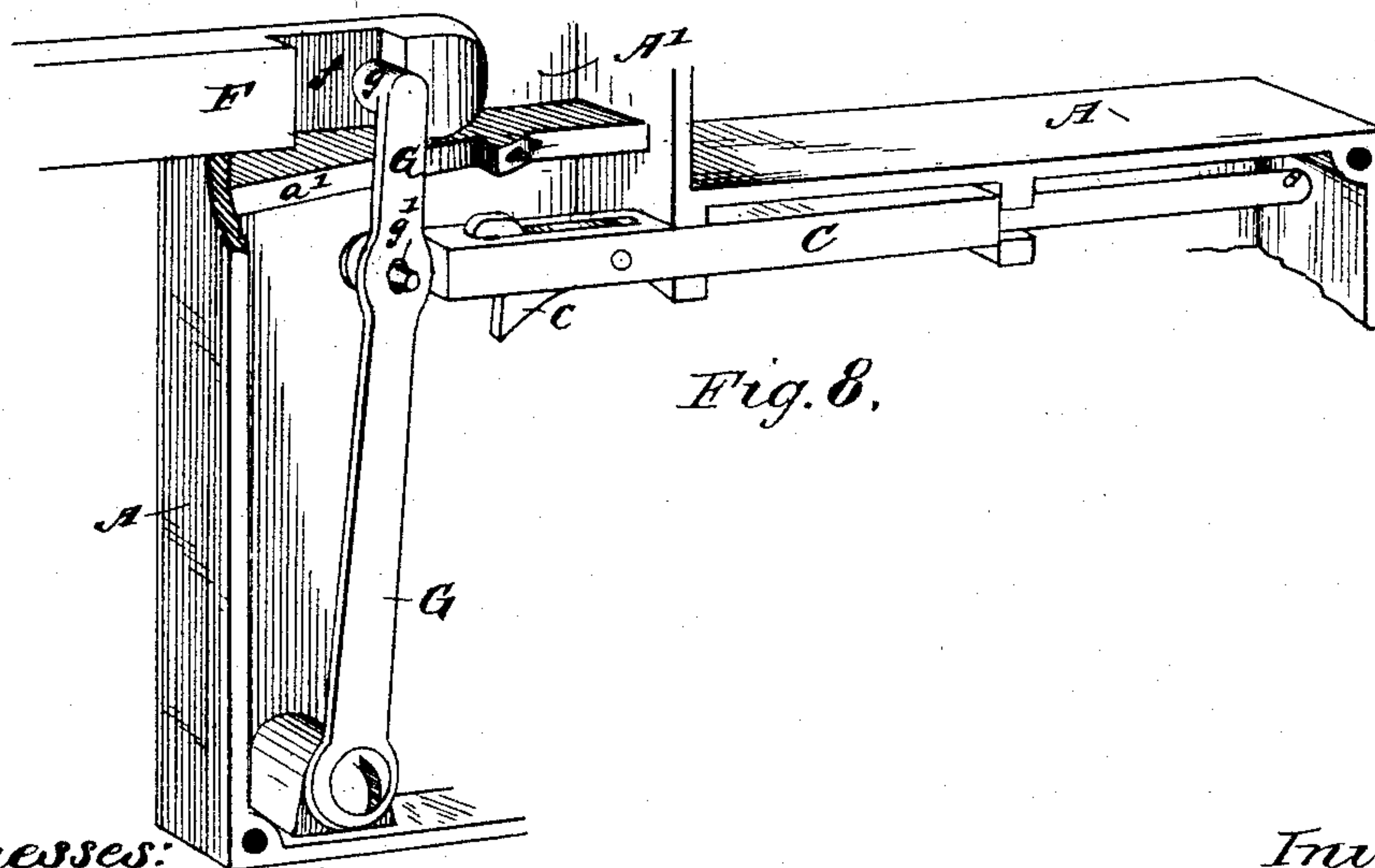
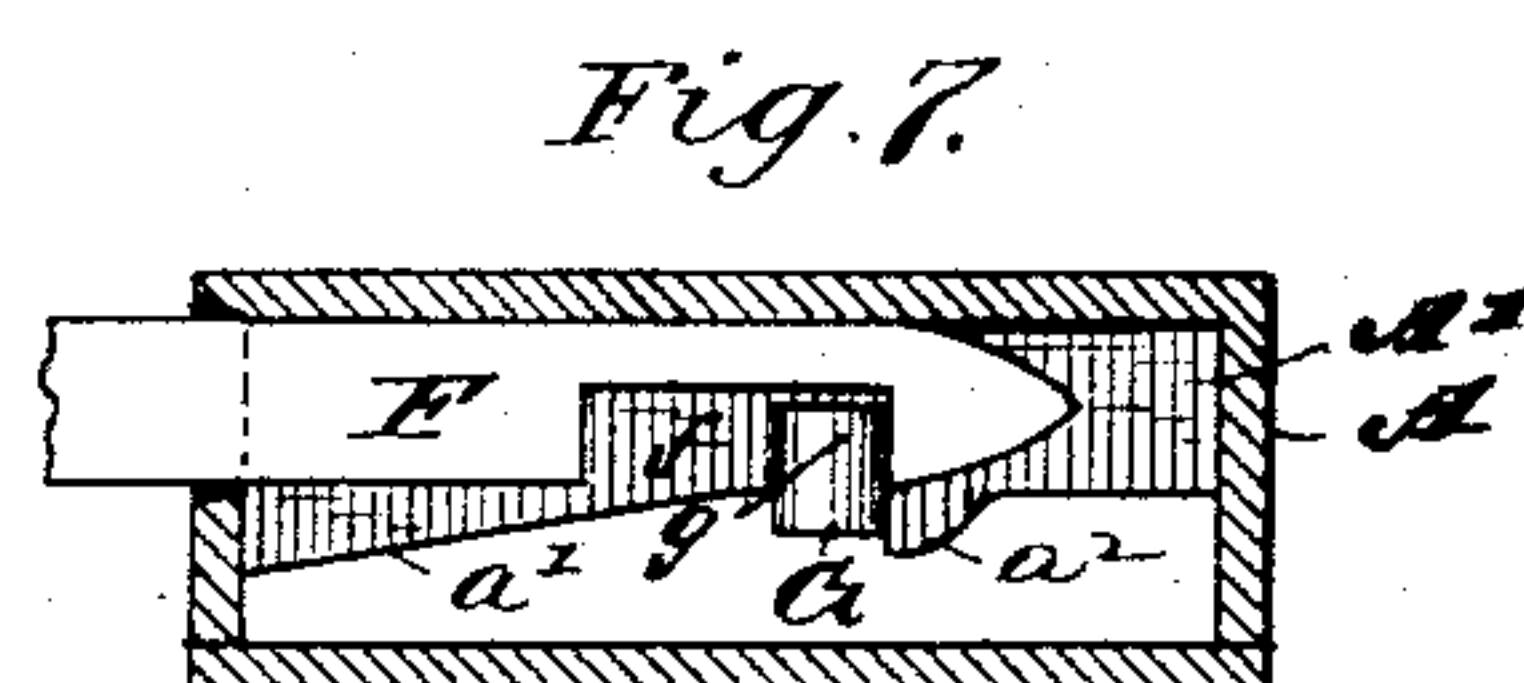
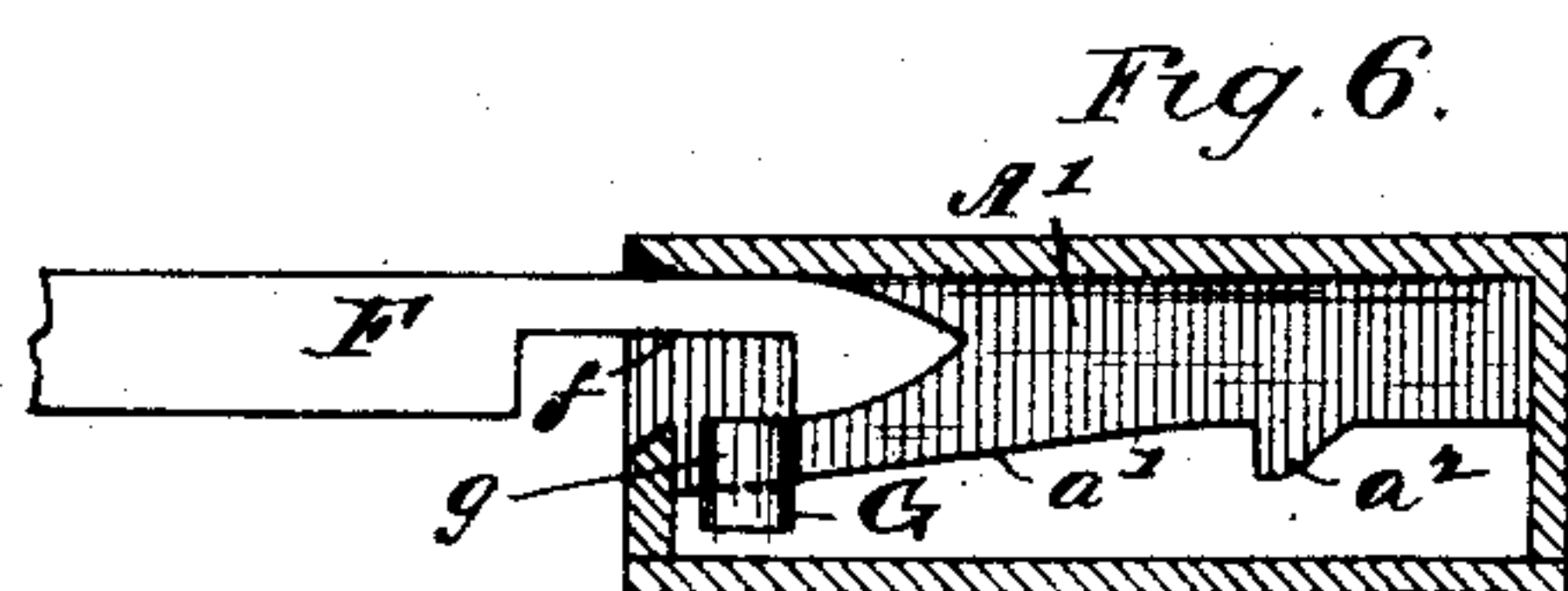
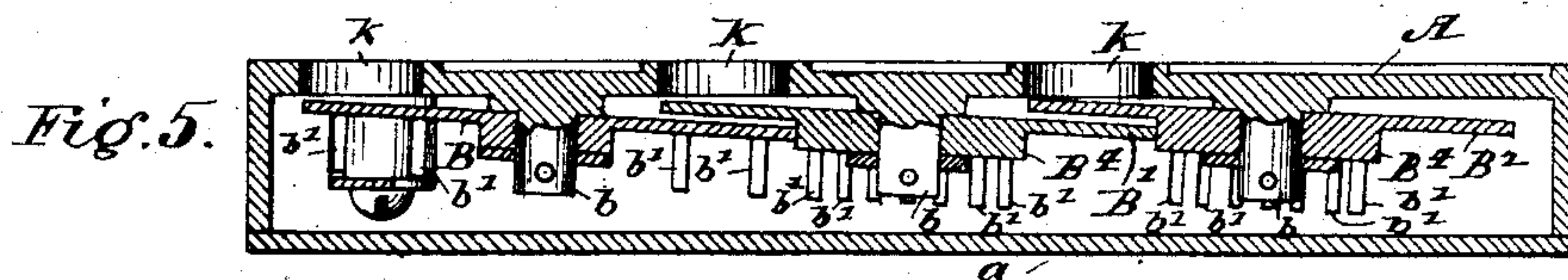
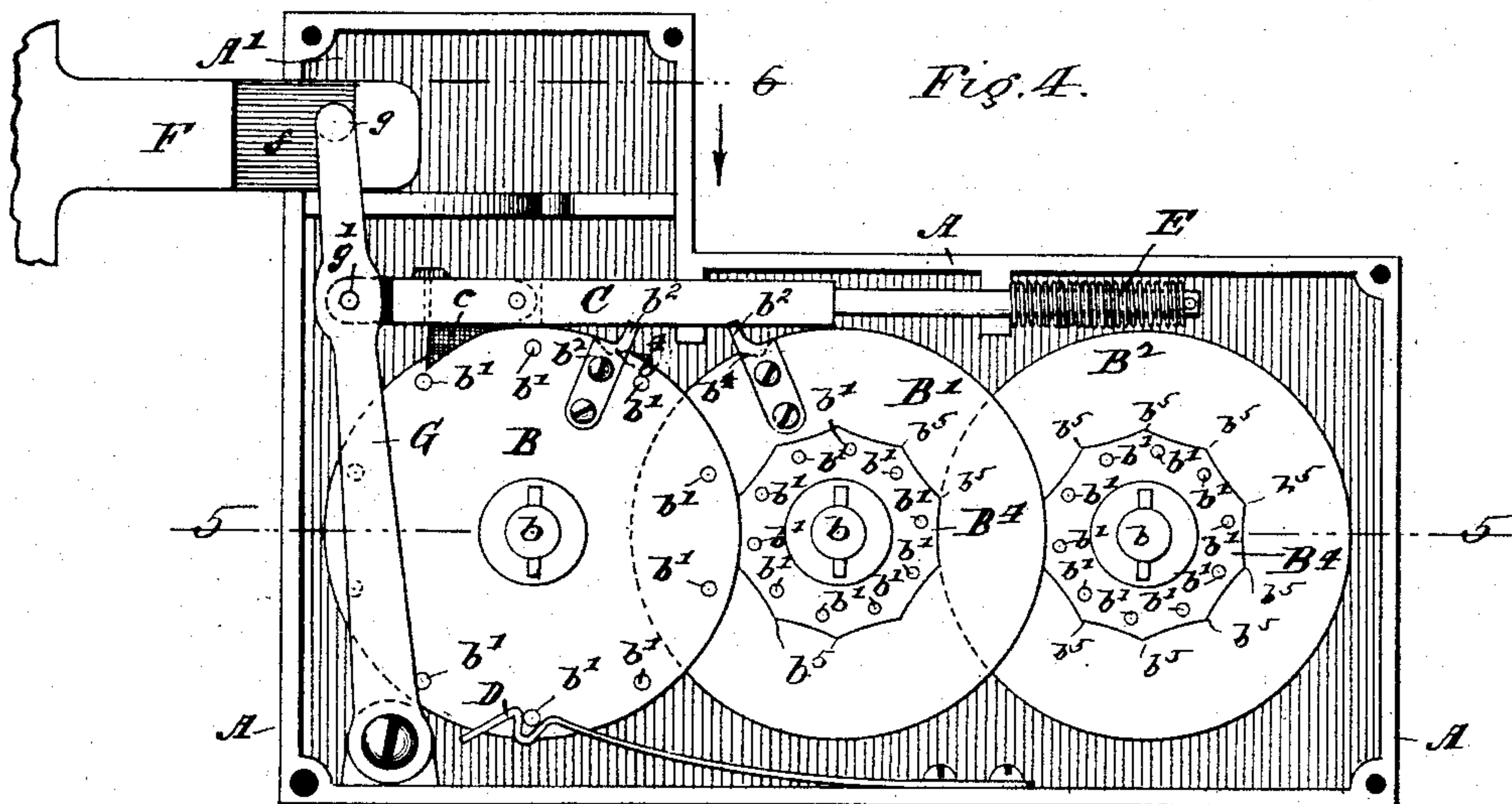
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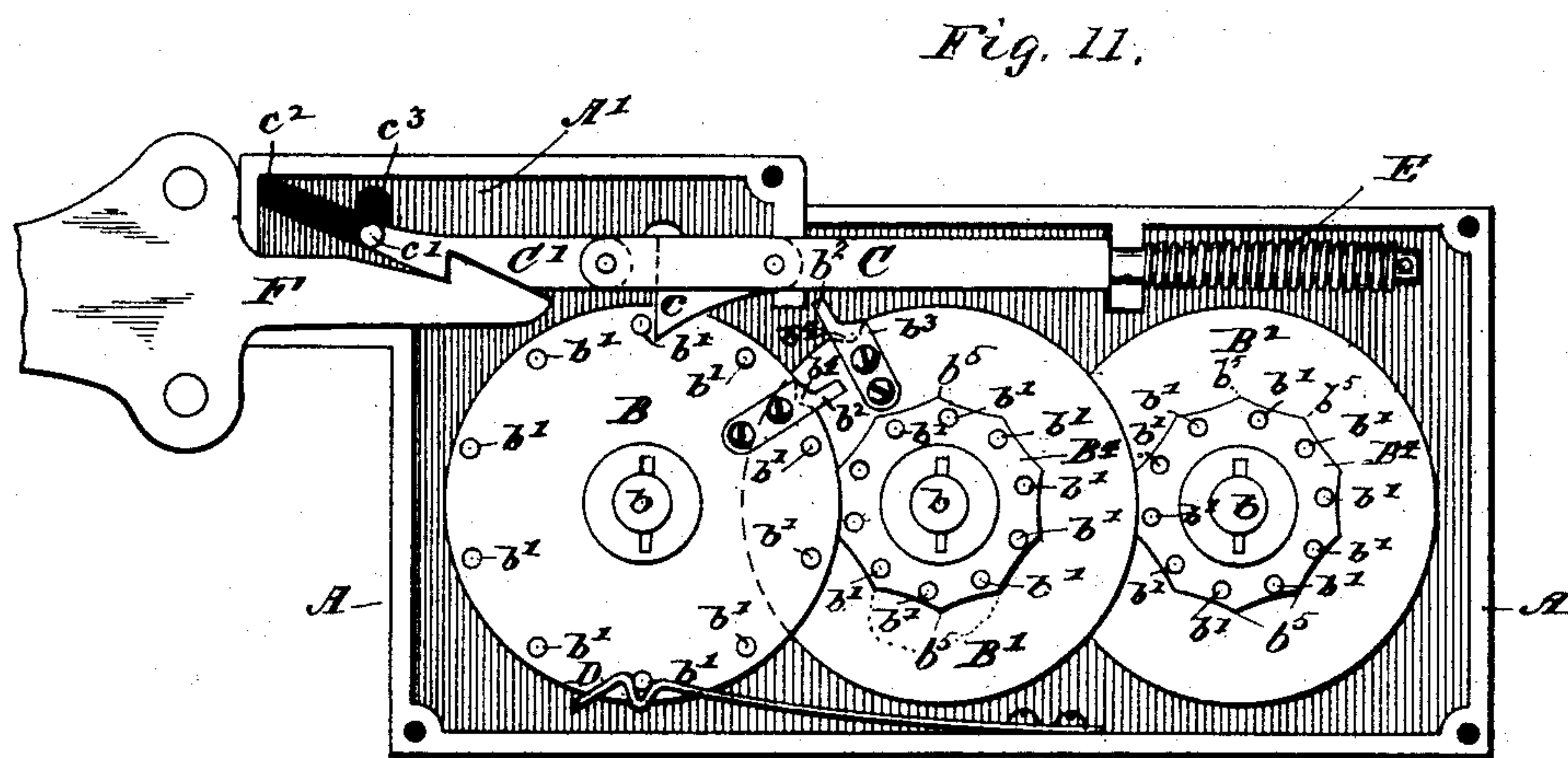
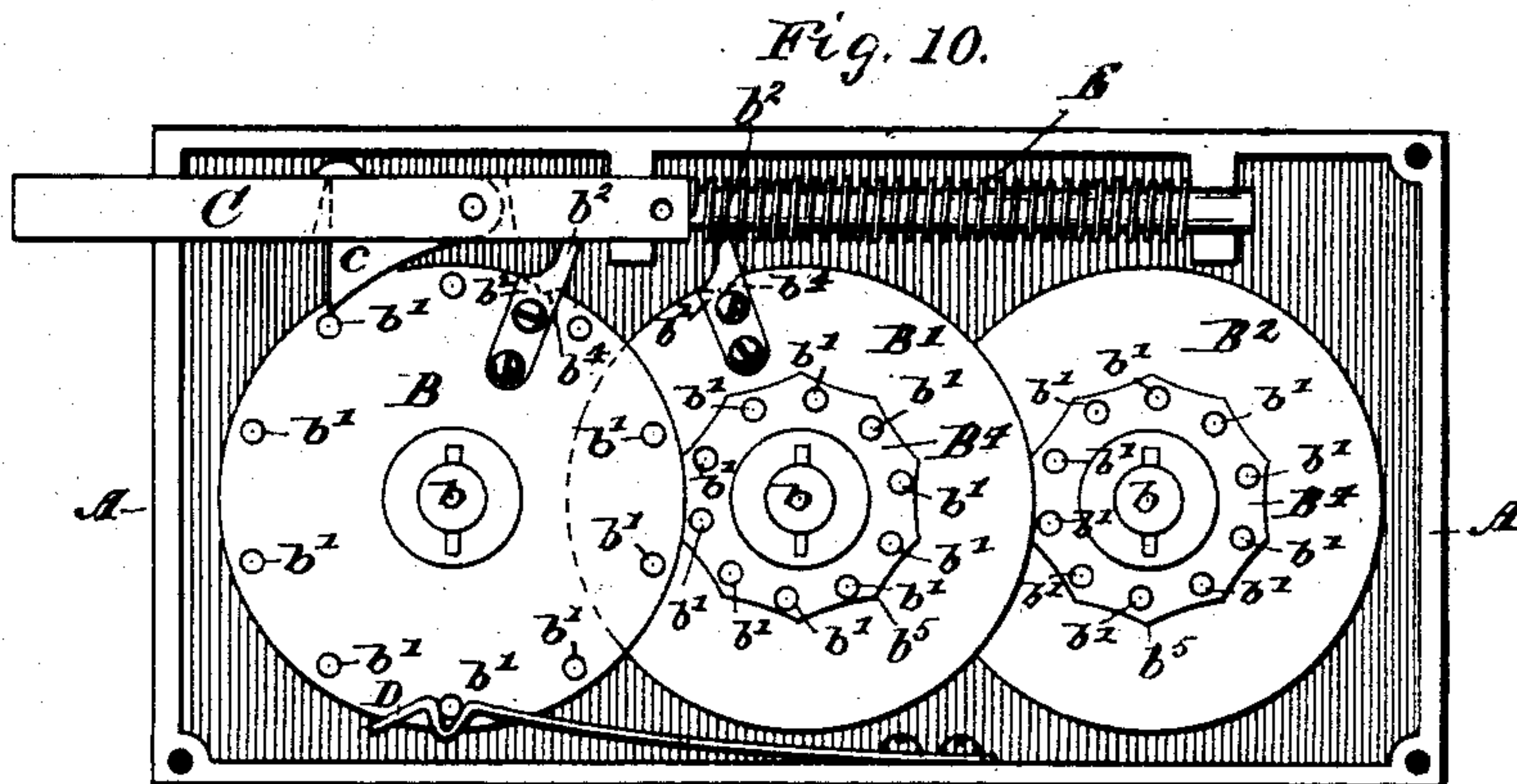
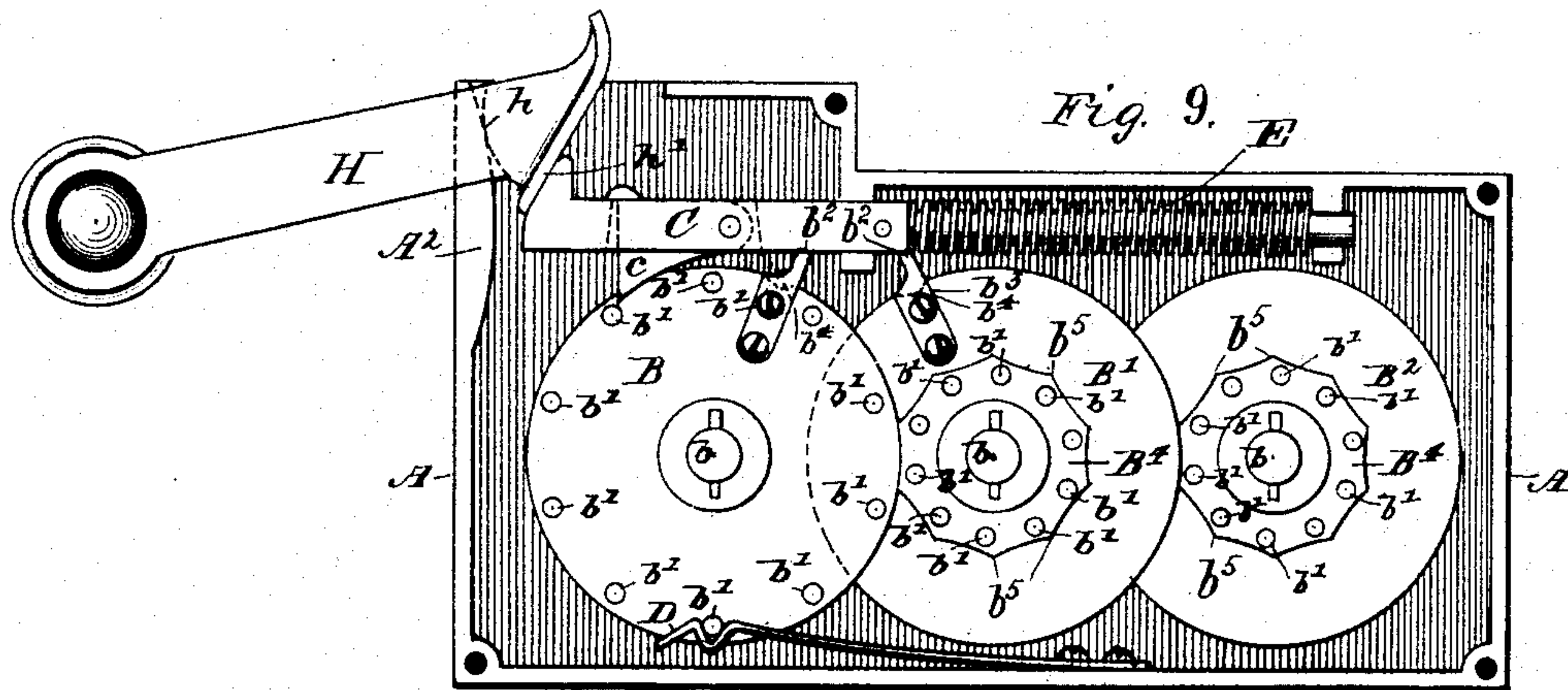
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# UNITED STATES PATENT OFFICE.

CHARLES WILLIAM BECK, OF CHICAGO, ILLINOIS.

## AUTOMATIC DOOR-REGISTER.

SPECIFICATION forming part of Letters Patent No. 412,588, dated October 8, 1889.

Application filed July 13, 1888. Serial No. 279,804. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES WILLIAM BECK, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Registers for Car-Doors and other Like Uses, of which the following is a full, clear, and sufficient description, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

The invention has mainly for its object to provide mechanism adapted to automatically and successively record or indicate the number of times access is had to the interior of a freight-car by way of the car-door thereof intermediate the starting-point and destination of the car, the invention consisting in the matters hereinafter set forth, and pointed out in the appended claims.

The invention essentially embraces one or more members capable of differential and intermittent motion, which motion is effected, through co-operating devices, by the operation of opening or closing the door in connection with which it is employed, the said member or members, as the case may be, being provided with figures, letters, characters, or other equivalent means which indicate the action successively thereof, and therefore the number of times which the door has been opened or closed.

The register when employed in railway service is contained within a suitable frame or shell, which is fixed to the car-door or car-frame and desirably exterior thereof, in order that the indicating devices may be readily seen. The devices which impart motion to the indicating member or members are wholly or in part located within the said frame or shell and are operated either directly or indirectly by the colliding or closing action or opening or separating of the door and frame.

The register desirably embodies a multiple arrangement of differentially and intermittently movable co-operating members, each provided with figures, letters, characters, or other suitable indicating means. Motion is given one member by the devices which are operated through the opening or closing action of the door, which member when oper-

ated for a suitable number of times imparts motion to the next adjacent member, which in turn when operated for a suitable number of times imparts motion to the third member, and so on, according to the number of members employed. The devices which impart motion to the indicating members are arranged and adapted to be actuated by direct collision with the car door or frame, as the manner of arrangement of the register thereon or thereabout may require, or by engagement with a latch-bar, bolt, or equivalent device fixed to the door or frame.

The invention is capable of various modifications of construction and arrangement without departing from its scope and intent, and I do not, therefore, limit myself to any exact form of construction or arrangement. I have deemed it proper, however, to illustrate in the drawings three forms of arrangement, to wit: when adapted to be operated by means of a latch-bar carried by the car door or frame and a slight modification or arrangement of such construction, when adapted to be thrown in position to be actuated through the resiliency of a spring when the door is opened by a latch fixed to the car door or frame, and when operated without a latch-bar or latch through the resiliency of a spring when the door is opened.

To generally describe the said drawings, Figure 1 is a front view in perspective of a register and operating latch-bar fixed to a car door and frame, respectively. Fig. 2 is an enlarged interior view in elevation of the register shown in said Fig. 1, showing from the rear the arrangement of indicating members and operating devices contained within the frame, the latch-bar and the devices within the frame being in normal position, as when the car-door is closed. Fig. 3 is a horizontal section of the register, taken on the line 3 3 of said Fig. 2. Fig. 4 is a view of the interior of the register shown in said above-described views, the latch-bar and devices embodied in the register being in operative position, as would be the case as the car-door is being opened. Fig. 5 is a horizontal section of the register, taken on the line 5 5 of said Fig. 4, the purpose of said view being to show the oblique arrangement of the indicating members within the shell with relation to the front



wall of the frame, through which, by means of suitable openings, the indicating figures, letters, characters, &c., carried by the indicating members are seen. Figs. 6 and 7 are horizontal details taken on the line 6 6 of Fig. 4, respectively illustrating the latch-bar as being released from the devices engaged thereby which operate the register as the car-door is being opened and as being in engagement therewith when the car-door is closed. Fig. 8 is an enlarged broken detail further showing in elevation the operative arrangement of the latch-bar and the devices engaged thereby which operate the indicating members. Fig. 9 is a rear elevation of a modified form of construction of the register with the back plate removed, a latch being substituted on the car door or frame for the latch-bar, (elsewhere shown,) which, engaging with the end of the reciprocable bar C when the car-door is closed, holds the said bar in retracted or operative position against the resiliency of a spring, which carries the same forward as the latch is removed from the end thereof, thereby operating the indicating member or members, as is hereinafter specifically described. Fig. 10 is a rear elevation of another modified form of construction of the register with the rear plate of the frame removed, the reciprocable bar C being adapted to be held in retracted position against the resiliency of an actuating-spring through engagement by its depending end, which projects from the shell or frame, with the car door or frame, the bar when freed by the opening of the door being adapted to carry the indicating member or members forward. Fig. 11 is a rear elevation of a slightly-modified form of construction of the register and latch-bar shown in Figs. 1, 2, 3, 4, 5, 6, 7, and 8 with the rear plate of the frame removed.

Referring by letter to the said several figures of the drawings, A indicates the frame of the register, which may be of any form suitable for sustaining its various working parts, and *a* the removable rear plate thereof.

B B' B<sup>2</sup> are disks provided each upon one of its lateral faces with digits from 0 to 9, inclusive, and capable of rotative movement upon axes *b*, fixed to or forming part of the frame. Each disk is provided on its face opposite to its face which is provided with the said figures with a number of studs or lateral projections *b'*, which correspond in number with the number of figures carried thereby. The disks B B' are also provided each with a radially-projecting toe *b<sup>2</sup> b<sup>2</sup>*, respectively, which engage with and operate, by means of the studs or projections *b'*, the said disks B' B<sup>2</sup>, respectively. The disks B' B are also provided on their studded faces each with a laterally-projecting portion B<sup>4</sup>, which is perimetrically concaved upon a radius corresponding with the extreme diameter or periphery of the next adjacent disk, and at a number of points corresponding with the number of figures carried, and therefore the number of suc-

cessive movements which it is intended to make in describing a full rotation. Disk B<sup>2</sup> overlaps disk B', and disk B' overlaps disk B, and these disks are arranged to rotate with their perimeters within and against said concaved surfaces, the said disks B B' being provided in their perimeters contiguous to the location of their respective toes *b<sup>2</sup> b<sup>2</sup>* each with recesses *b<sup>4</sup>*, which receive the points *b<sup>5</sup>* of the concaved portion B<sup>4</sup> when the toe engages with a lateral projection *b'*, thus enabling the turning of the engaged disk upon its axis, which movement is at other times prevented by the operative arrangement of peripheral and concaved surfaces, as shown.

A reciprocally-movable bar C, sustained in suitable bearings forming part of or fixed to the frame A, carries an engaging device, preferably in the form of a pivoted dog *c*, adapted to engage at each forward motion of the bar with one of the lateral projections *b'* of the disk B and to carry said disk forward for a definite distance, the disk being held against backward or other movement at the end of each stroke by a spring-detent D, which engages desirably, as shown in Figs. 2, 4, 9, 10, and 11, with a lateral projection *b'*. The said bar is provided with a resistance-spring E, adapted to retract it to its normal position following each forward stroke thereof when the arrangement of parts is as substantially shown in Figs. 2 and 11, or to carry the same forward when the arrangement of parts is as substantially shown in Figs. 9 and 10. The dog *c*, being adapted to vibrate upon its pivot, may depend upon gravity alone, as shown in the drawings, to hold it operatively in position, or a suitable operating-spring (not deemed necessary to be shown) may be employed in connection therewith, the working arrangement of the dog being such that when the bar is carried rearwardly it is free when coming in contact with the next rearward projection *b'* to be moved upward thereby, and when carried beyond the projection to drop into position in rear of it, as shown in Figs. 2 and 11, preparatory to the next forward movement of the bar.

When a latch-bar F is employed for operating the bar C, the arrangement of the parts is preferably as shown in Figs. 2, 4, and 6, viz: An arm G, pivotally held to the frame A and provided at its free end with a suitable lateral projection *g*, is pivotally connected with the depending end of the bar C, as indicated by reference-letter *g'*. The latch-bar F is provided in its free end, which is tapered sufficiently for the purpose required, with a recess *f*, which receives the projection *g* of the arm G. The said arm G is preferably made of sheet-steel, and hence it is flexible laterally, and when the register and latch-bar are brought together the latch-bar, which is normally held in the position shown in Figs. 2 and 7, is moved laterally by the tapered end of the latch-bar until such device has fully entered the chamber A' provided therefor in



the frame, at which instant the projection  $g$  (see Fig. 7) drops into the recess  $f$ . As the latch-bar  $F$  and register are being separated by the opening of the door, the arm  $G$  is carried forward by the latch-bar until the projection  $g$  is withdrawn from the recess  $f$ , (see Fig. 6,) which withdrawal is desirably effected by means of an increasing tapered bearing-surface  $a'$ , upon which the arm  $G$  works laterally through its forward movement, formed by the lower floor of the chamber  $A'$ , a lip  $a^2$ , projecting outwardly from said floor, forming a stop for determining the length of rearward movement of the arm  $G$  when released.

In Fig. 11 the latch-bar is shown to be hook-shaped at its depending end in substitution of the recess  $f$ , above described. The bar  $C$  is provided beyond the pivoted dog  $c$  with a hinged section  $C'$ , which is hook-shaped, corresponding with the end of the latch-bar. The outer end of the section  $C'$  is provided with a boss or projection  $c'$ , and the chamber  $A'$  with an increasing inclined grooved guideway  $c^2$  therefor. As the latch-bar and register, which are obviously in engagement by means of the said hook devices, are being separated by the opening of the door, the bar  $C$  is carried forward by the latch-bar until the section  $C'$  is moved sufficiently upwardly by means of the projection  $c'$  and guideway  $c^2$ , at which instant the bar is released and retracted to its normal position, as is heretofore described. When the latch-bar and register are brought together, engagement of the hook-shaped surfaces is effected by the tapered end of the latch-bar passing under the hinged section, which, being held normally in position by means of its own weight or by a suitable spring, (not deemed necessary to be shown,) moves upwardly until the latch-bar has entered the frame far enough, at which instant the hook of the hinged section drops into position, upward movement of the hinged section being provided for in the form of a suitable recess  $c^3$ , likewise formed in the wall of the chamber  $A'$ , within which the projection  $c'$  plays.

By the modified form of construction shown in Fig. 11 it will be noted that the arm  $G$  is dispensed with.

In Fig. 9 the bar  $C$  is shown to be normally held in retracted position against the resiliency of an actuating-spring by means of a latch  $H$ , which is pivoted to the car door or frame. The frame  $A$  is provided with a slot  $A^2$ , into which the latch, which is suitably formed at its extremity, is carried, the latch being adapted to bear by its portion  $h$  against the inner surface of the frame contiguous to the slot  $A^2$ , and thus secure the door and frame together, the outer end  $h'$  of the latch bearing against the end of the bar  $C$  and holding it in position until removed therefrom, at which instant the bar is carried forward by the spring  $E$  operating the disk  $B$  in the manner above described.

In Fig. 10 the latch-bar and latch are shown to be entirely dispensed with. As the car door and frame are brought together, the bar  $C$  is carried rearwardly, and thus held in position until the door is opened, at which instant the spring  $E$  carries the bar forward, operating the disk  $B$  through one of its motions, as set forth.

To further describe the operation of the register, the disks  $B$   $B'$   $B^2$  being, for example, primarily arranged with their figures so located that the 0 appears before each opening  $K$  formed in the frame, each successive forward movement of the bar  $C$  carries the disk  $B$  ahead one figure until 0 is again brought before the first opening, this last operation of the disk bringing its toe  $b^2$  in engagement with a projection  $b'$  of the disk  $B'$ , which carries the said disk ahead so as to present the figure 1 thereof, which manifestly forms 10. The next operation of the disk  $B$  causes its digit 1 to be presented, which forms 11, and so on until the second full revolution thereof is described, which causes digit 2 of the disk  $B'$  to be presented, which forms 20, and so on until the disk  $B'$  shall have been operated ten times, presenting the figure 0, at which last movement, by means of its toe  $b^3$ , which engages with a projection  $b'$  of the disk  $B^2$ , the disk  $B^2$  is carried forward one figure, which presents 1, thereby forming 100, and so on until the maximum number of which the device is capable is reached, following which the zero or primary indicating-figure is again presented.

I claim as my invention and desire to secure by Letters Patent—

1. In an automatic door-register, the combination of suitable registering-disks with latch-bar  $F$ , flexible arm  $G$ , and reciprocable bar  $C$ , spring  $E$ , and dog  $c$ , for actuating the registering-disks, as and for the purpose specified.

2. The combination, with registering-disks of the reciprocable bar  $C$ , pivoted dog  $c$ , spring  $E$ , with arm  $G$ , and the inclined bearing-surface  $a'$  for releasing-arm  $G$ , as and for the purpose specified.

3. The combination, with registering-disks of the rigidly-fixed latch-bar  $F$ , with arm  $G$ , and inclined bearing-surface  $a'$ , for actuating the registering-disks, as and for the purpose set forth.

4. In an automatic door register, a fixed latch-bar  $F$ , provided with a recess and inclined end surface, in combination with a transmitting member flexible laterally, having a lug  $g$ , and with an inclined bearing-surface  $a'$ , upon which the arm  $G$  works, all parts adapted to co-operate to actuate the registering-disks, substantially as set forth.

5. In an automatic door-register, the combination, with one or more registering-disks, of a latch-bar, as  $F$ , the flexible arm  $G$ , and a tripping device—such as bearing-surface  $a'$ —for engaging and disengaging said latch-bar and



arm, so as to impart motion to the registering-disks, substantially as and for the purpose set forth.

6. In an automatic door-register, the combination, with a latch-bar, of one or more registering-disks, mechanism operated by said latch to actuate the disks comprising a reciprocable spring-rod, the movement of which actuates the disks, and a tripping device to release said mechanism and latch when the door is opened, substantially as described.

7. In an automatic door-register, the combination, with actuating mechanism, of two or more axially-movable overlapping indicator members having concentric laterally-projecting hubs or portions smaller than the same, said hub being provided with a peripheral series of projections fitting against the periphery of an adjoining member to normally lock the same, a concentric series of lateral projections on each hub, and fixed toes projecting radially from the periphery of the members and adapted to consecutively engage the lateral projections of an adjoining member, said members being provided with peripheral recesses in proximity to the toes, for the purpose set forth.

8. The combination, with actuating mechanism, of a pair of rotatable indicator members, each cast integral and consisting of a disk having the indicating characters on one side and a concentric lateral hub or portion on the other side smaller than the disk, and having a peripheral series of concaved projections fitting against the periphery of the adjoining disk to normally lock the same, a series of lateral projections on the side of the hub, and a toe projecting radially from the periphery of the disk to engage the lateral projections of the next adjoining member, said disk being provided with a peripheral recess beneath the toe, for the purpose set forth.

9. In an automatic door-register, the com-

bination, with a reciprocable bar carrying a pawl, of a rotatory indicator-disk having a concentric series of lateral projections adapted to be engaged by said pawl and thereby rotate the disk, a toe projecting radially from the periphery of the disk and provided with a peripheral recess beneath the same, and another rotatory indicator-disk having a lateral concentric hub on one side of less diameter than the disk, said hub being provided with a peripheral series of radial projections engaging the periphery of and normally locking said first-mentioned disk, and a series of lateral projections on the side of said hub engaged by said toe, for the purpose set forth.

10. The combination of a car-door provided with a fixed and rigid latch-bar F, suitable indicator members, and intermediate mechanism—such as flexible arm G and spring-bar C—by which the direct thrust or pull of the latch-bar is transmitted thereto to operate the same, as specified.

11. In an automatic door-register, the combination, with the latch, of one or more registering-disks, intermediate mechanism, substantially as described, operated by said latch when the door is opened or closed to actuate the disks, and a tripping device—such as an inclined bearing-surface—to disengage said mechanism and latch when the door is opened, substantially as described.

12. In an automatic door-register, the combination, with a latch, of one or more registering-disks, a reciprocable spring-rod carrying a pawl to rotate said disks, said rod being operated by said latch when the door is opened or closed, and means for releasing said latch from the rod when the door is opened, substantially as described.

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