

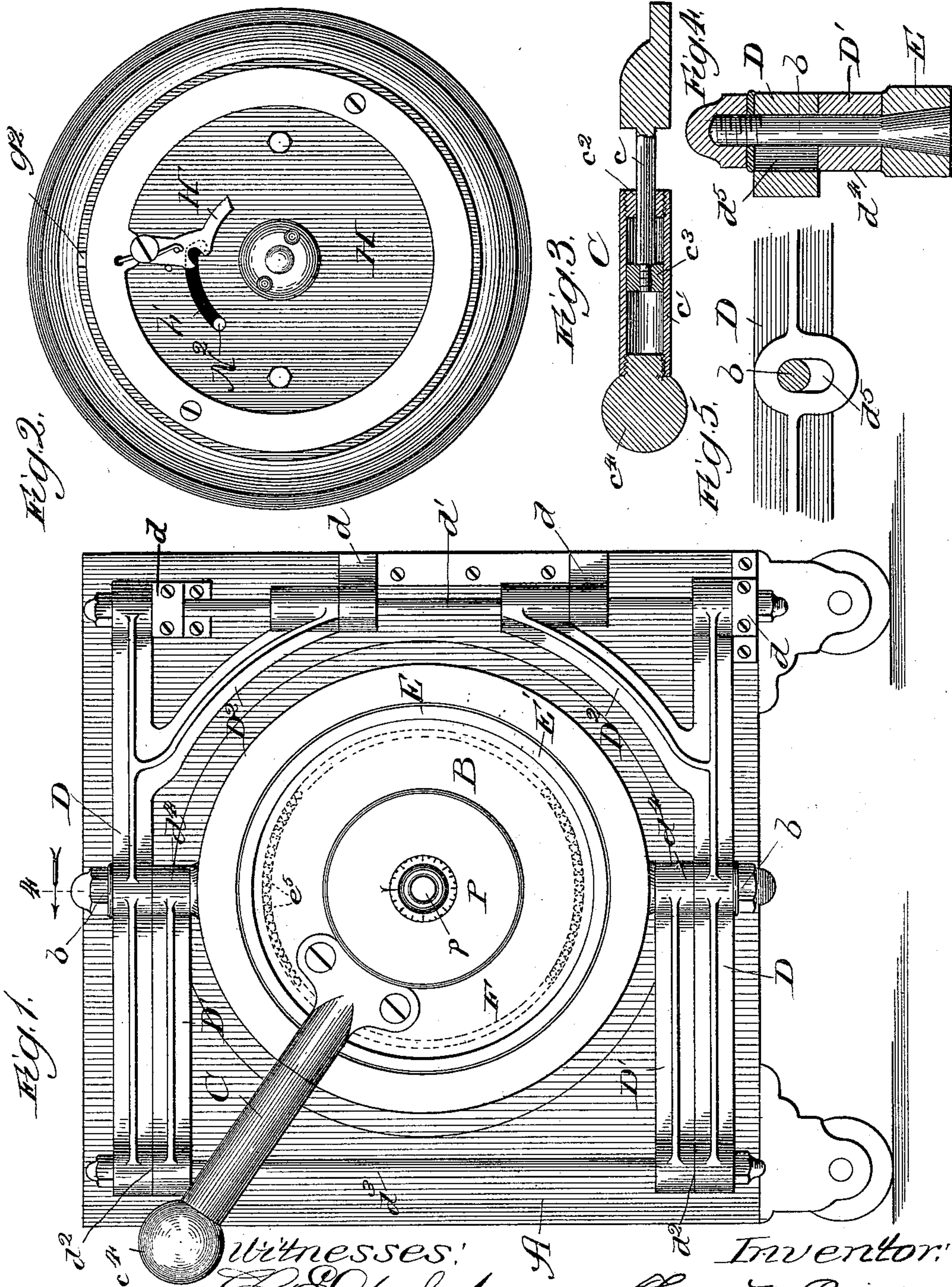
(No Model.)

3 Sheets—Sheet 1.

T. M. BRINTNALL.  
SAFE.

No. 481,137.

Patented Aug. 16, 1892.



Witnesses:  
Charles Clayford,  
Edford White.

Inventor:  
Thomas M. Brintnall  
By Walter H. Chambers  
Att'y



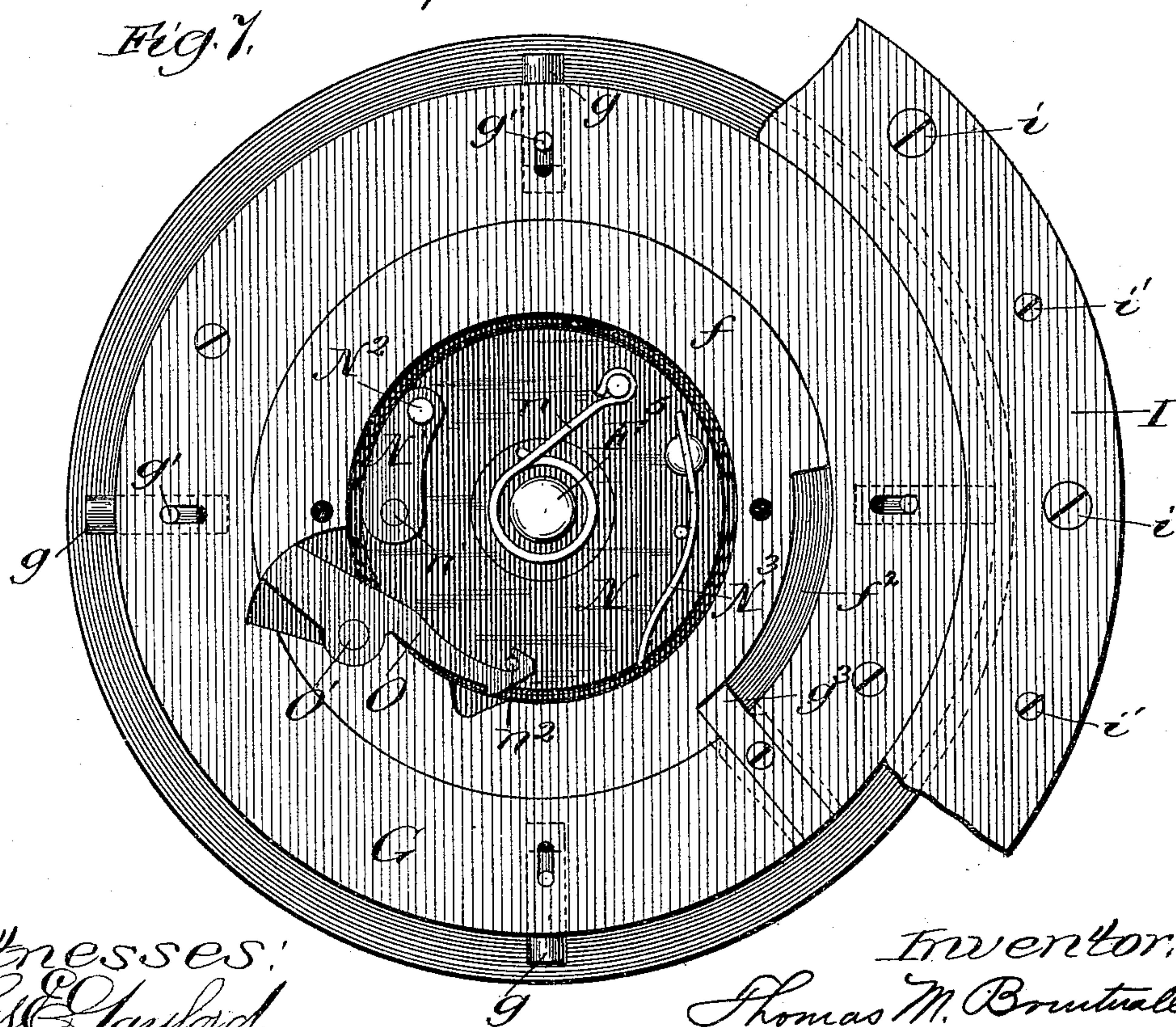
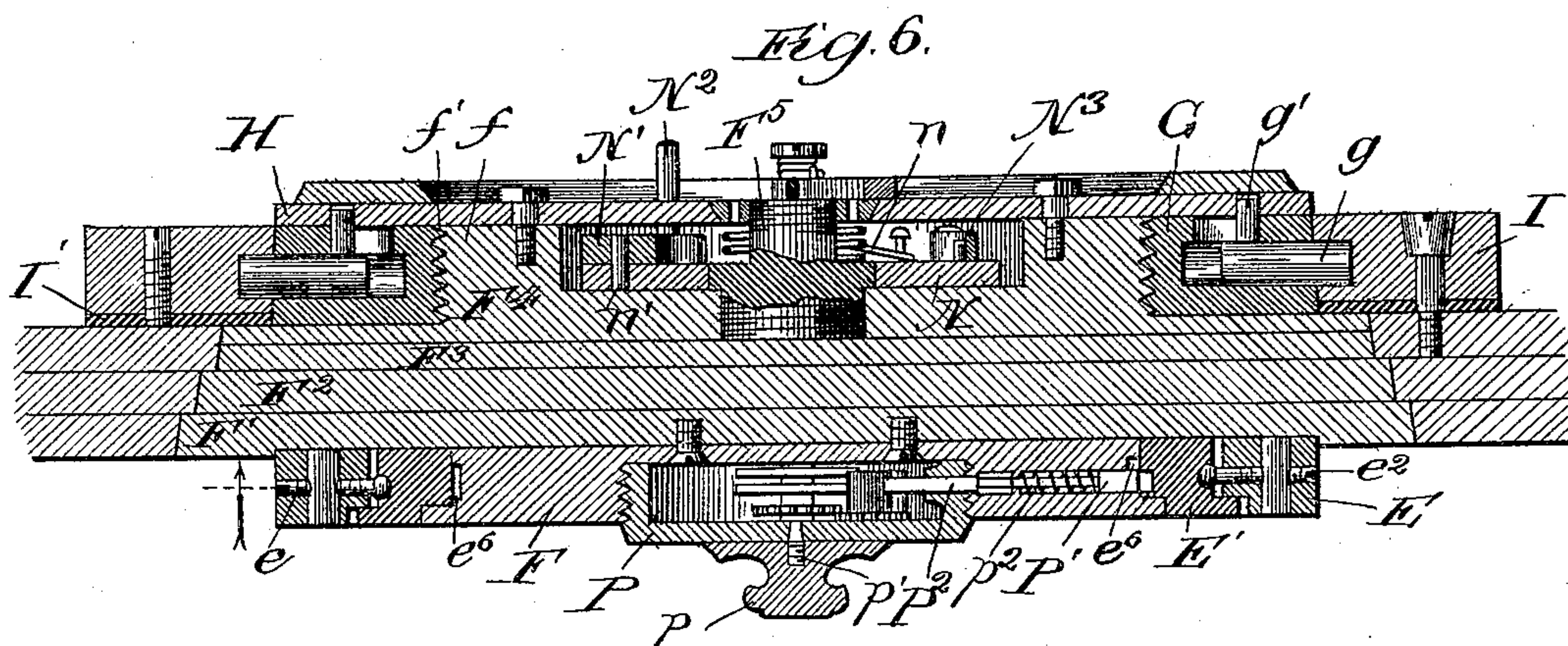
(No Model.)

3 Sheets—Sheet 2.

T. M. BRINTNALL.  
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No. 481,137.

Patented Aug. 16, 1892.



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Att'y



(No Model.)

3 Sheets—Sheet 3.

T. M. BRINTNALL.  
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No. 481,137.

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Fig. 8.

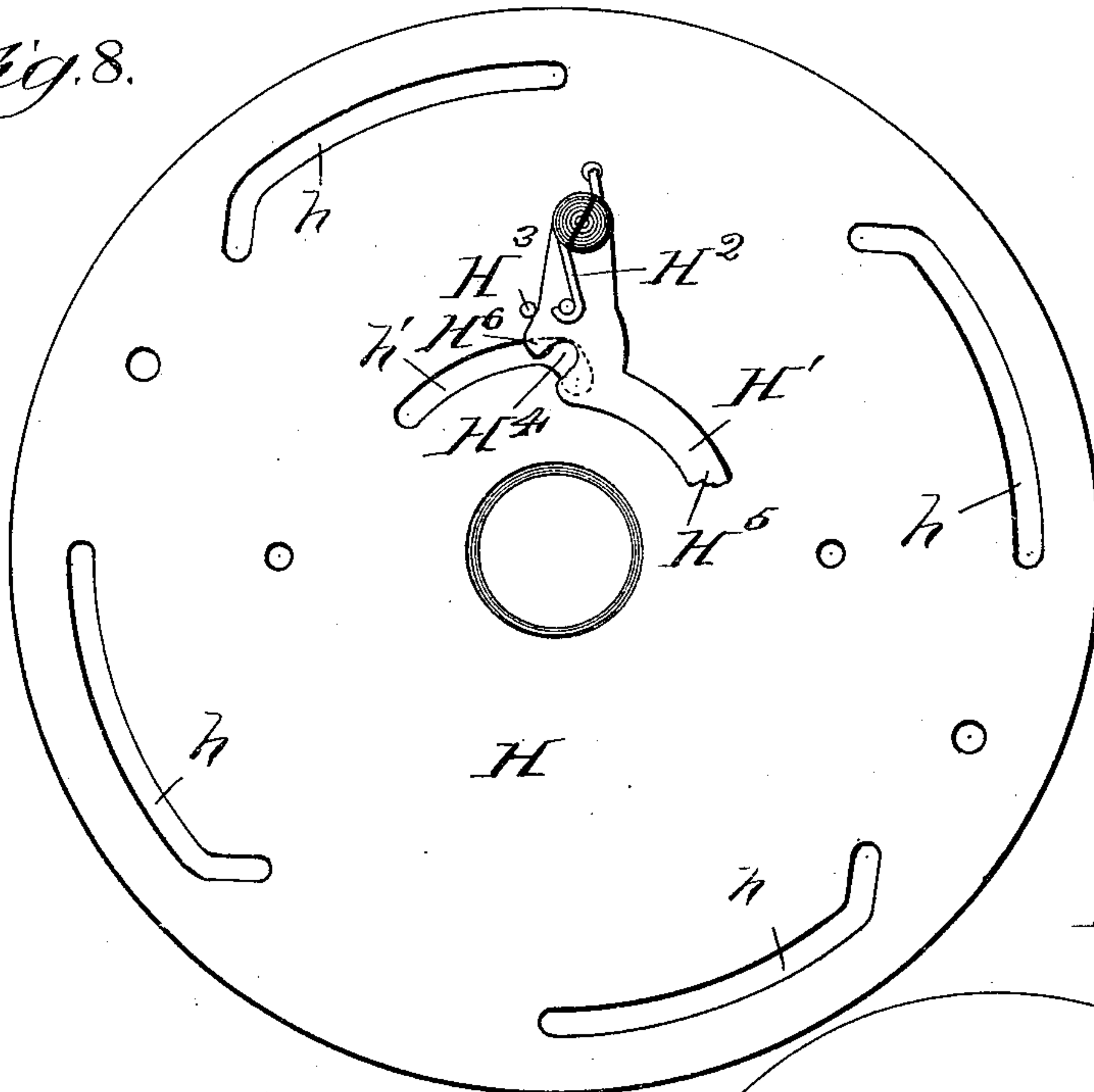


Fig. 10.

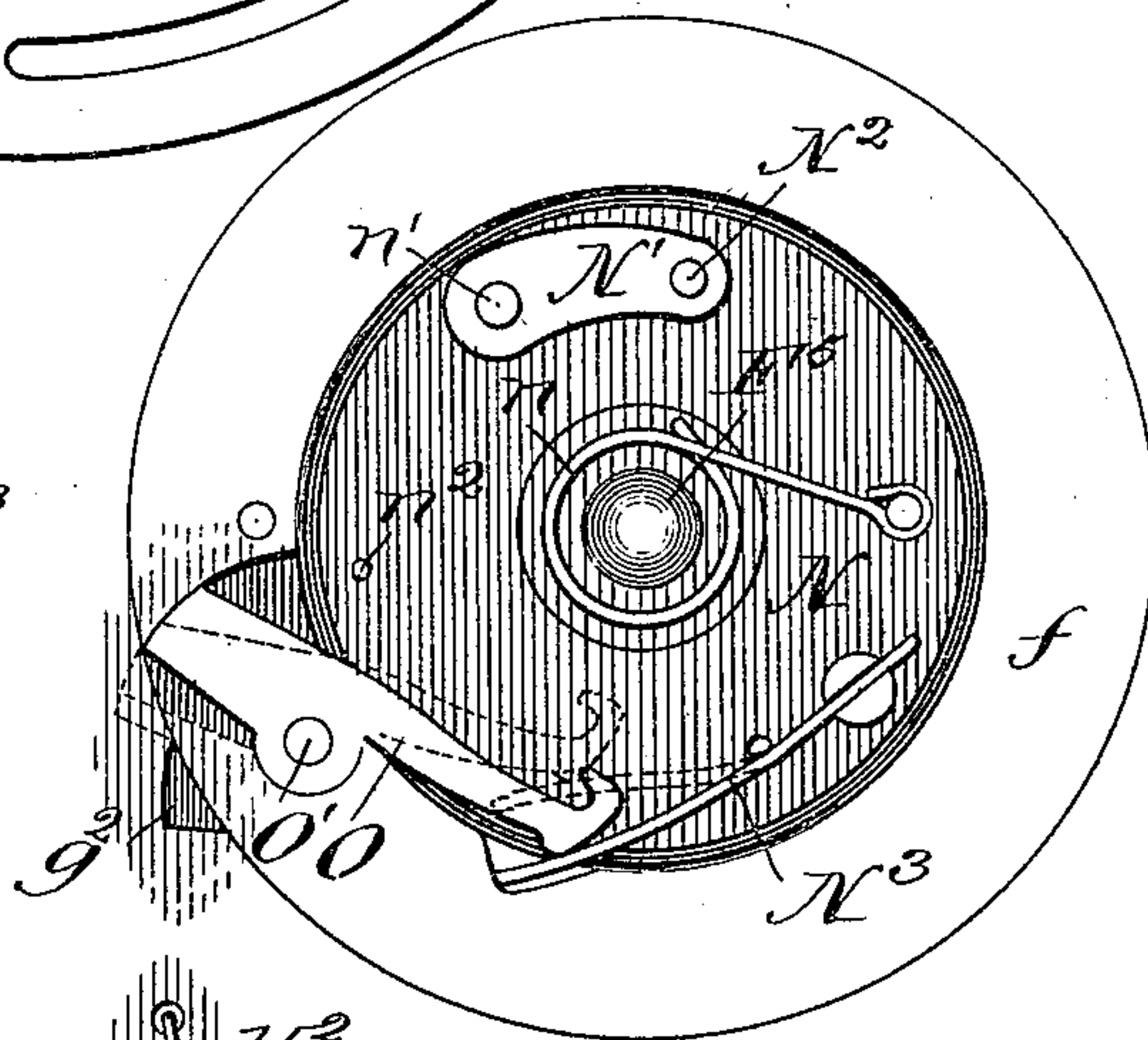


Fig. 9.

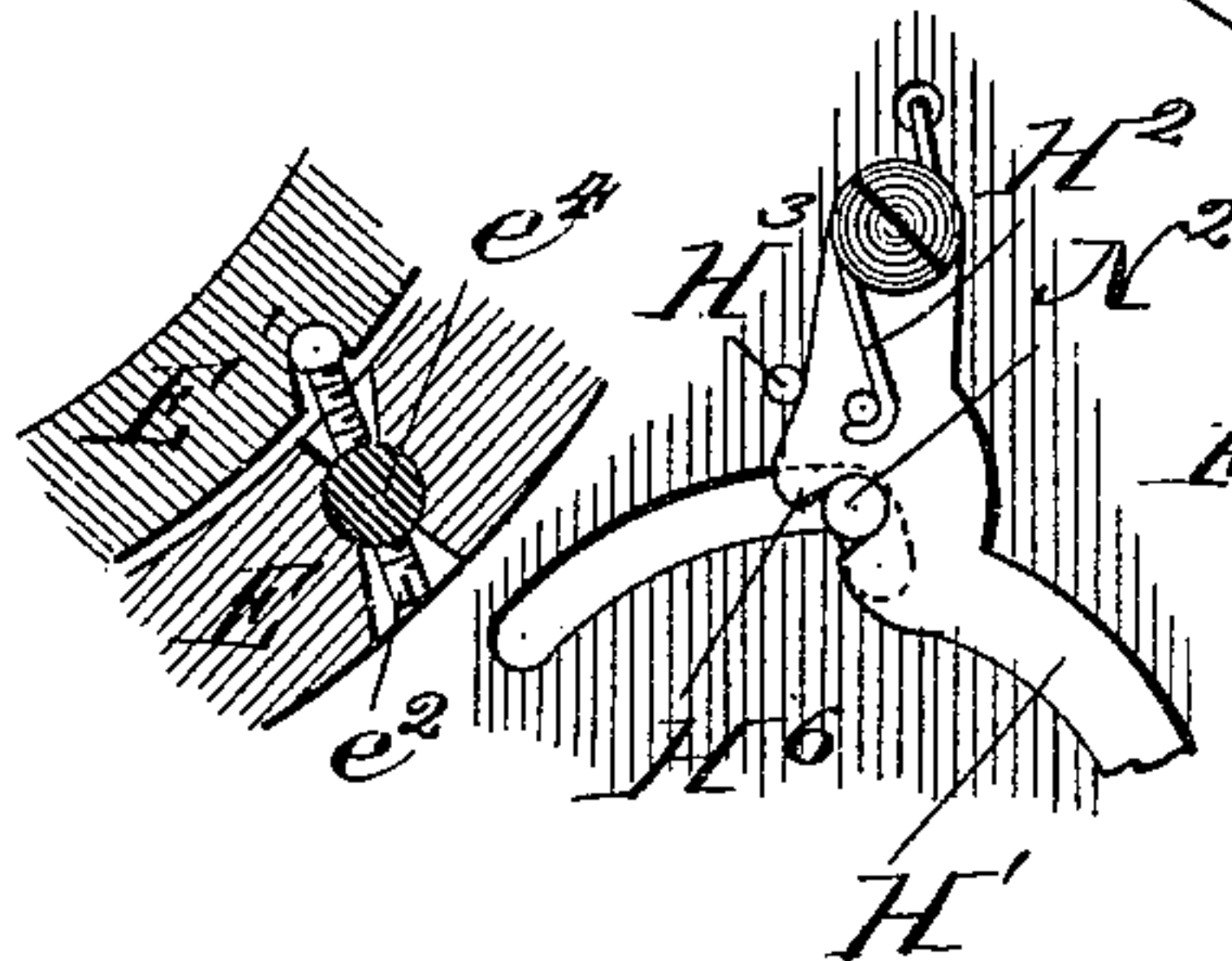
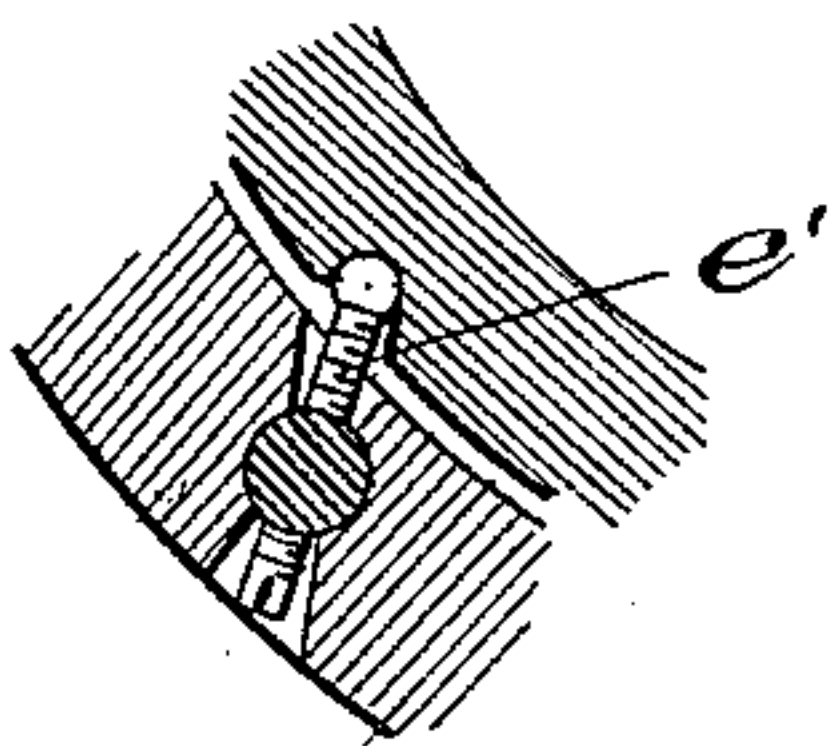
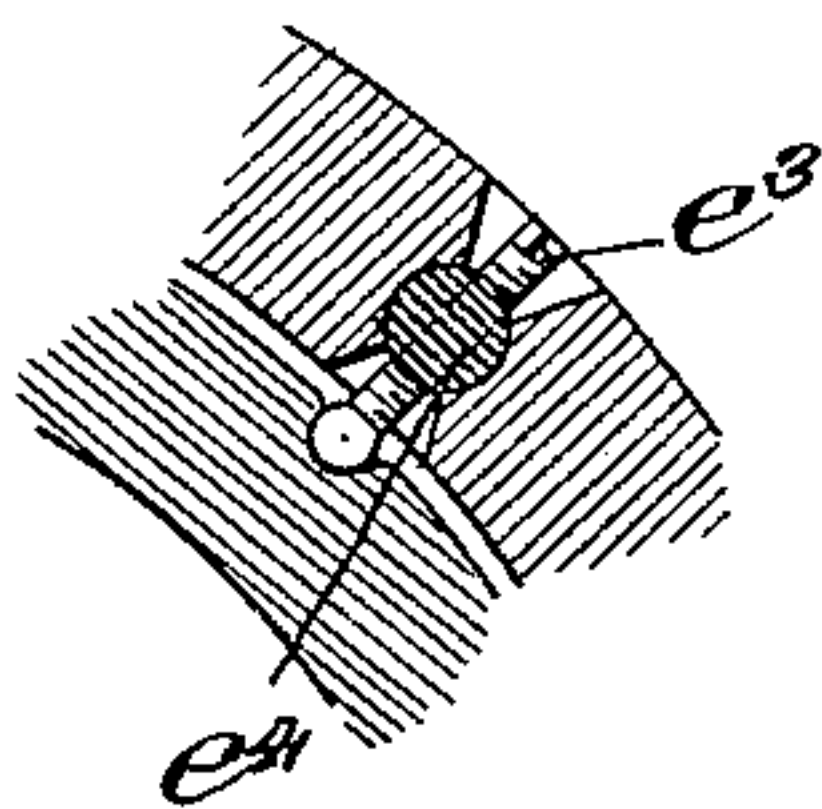
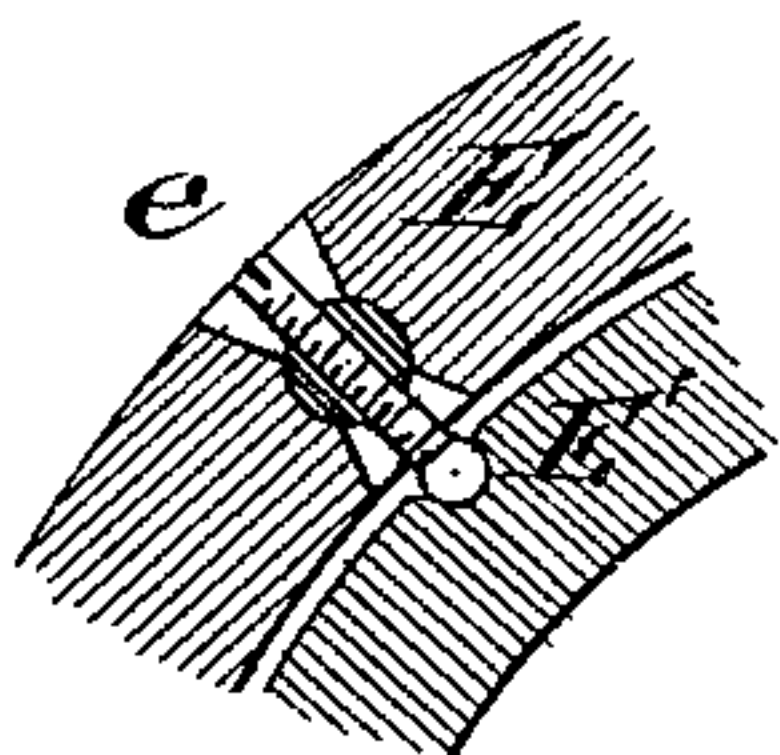


Fig. 11.

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# UNITED STATES PATENT OFFICE.

THOMAS M. BRINTNALL, OF CHICAGO, ILLINOIS.

## SAFE.

SPECIFICATION forming part of Letters Patent No. 481,137, dated August 16, 1892.

Application filed February 16, 1891. Renewed January 16, 1892. Serial No. 418,327. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS M. BRINTNALL, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented a certain new and useful Improvement in Safes; and I declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object the production of a safe, vault, or other strong room having a circular door, in which the boltwork by means of which the door is locked shall be automatically thrown by the revolution of the door.

The invention also has for its object the production of various other improvements which will be hereinafter more fully set forth and claimed.

In the drawings, Figure 1 is a side elevation of a safe and door embodying my invention. Fig. 2 is an elevation of the inner face of the door. Fig. 3 is a sectional view of the door-lever. Fig. 4 is a section through the hinge-arms and door-pin engaged therein. Fig. 5 is a plan of the same. Fig. 6 is a sectional view through the door. Fig. 7 is a view of the inside of the door with the outer plate removed. Fig. 8 is a view of this outer plate. Fig. 9 illustrates suitable mechanism for centering the door. Fig. 10 shows the dogging-latch in a position for dogging the door when revolved. Fig. 11 is a detail of the latch operated by the time-piece.

In carrying out my invention, I have shown and described it in connection with what is ordinarily understood by the term "safe;" but I would have it understood that the invention is applicable, either in whole or in part, to a safe, chest, vault, or, in fact, a strong room or box of any kind, and by the term "safe" throughout my specification and claims I would be understood as embodying in the one word any or all of these or similar terms.

A represents the body or front of the safe, and B the door.

C is a lever engaged to the door whereby a purchase or leverage may be obtained to revolve the same. This lever may be a single

piece, but I prefer to make it in two sections, as shown at  $c\ c'$ , the section  $c$  telescoping or sliding within the section  $c'$ , whereby the lever may be extended in length when in use. The section  $c$ , engaged rigidly to the door, is passed through the fitting  $c^2$  in the end of the hollow section  $c'$ , and provided with a fitting  $c^3$  on the end. A knob or ball  $c^4$  forms a suitable handle and closes the end of the section  $c'$ .

D represents the long arms and  $D'$  the short arms of the hinge-frame. The long arms are provided with the braces  $D^2$  and are pivoted to the body of the safe through the lugs  $d$  by the hinge pin or rod  $d'$ . These long arms extend to the opposite side and their ends are pivoted to the short arms, as at  $d^2$ , by the hinge-rod  $d^3$ . The other end  $d^4$  of each short arm terminates at the center of the door, one above and one beneath.

$b$  are pins or lugs extending from the door through the ends  $d^4$  of the short arms and through the slots  $d^5$  in the long arms, as in Figs. 4 and 5, a knob being screwed onto the end of each pin or lug  $b$  to hold the parts together. Now, as will be seen, the door is supported by the long arms, but the play of the lugs  $b$  in the slots of the long arms enables the operator after he has thrown the door to its closed position to carry it squarely to its seat by means of the short arms. The hinge-rod  $d^3$  also forms a convenient handle, whereby the door may be swung. Of course, if desired, a pressure-bar may be employed to start the door from its seat, but as these are common in connection with safe-doors I have not shown it.

I will now describe the construction of the door, as shown in Fig. 6. E is the hinge or outer ring to which the lugs  $b$  are engaged. Within this hinge-ring is the ring  $E'$  and within this ring  $E'$  is the plate F of the door proper. The plate F is suitably engaged to the door-plates  $F'$   $F^2$   $F^3$ . These latter, as will be seen, are of decreasing diameter from the outer to the inner, thus making the periphery of the door flanged or stepped, and the frame or jamb is of course similarly flanged or stepped. As it frequently happens that for various reasons—such as wear, &c.—the door must be centered, I have provided for an adjustment between the hinge-ring E and



the ring  $E'$ . It consists of set-screws  $e, e', e^2, e^3$ . These screws support the door, as in Fig. 9, and by loosening the proper ones and tightening others the door may be adjusted in any direction to "center" it with respect to its opening in the frame or jamb. These set-screws, as will be seen, have a ball-and-socket bearing on the ring  $E'$ , and are journaled in the circular pins  $e^4$ , so that no matter in which direction the ring  $E'$  is adjusted the screws accommodate themselves to the change in the angle. I have shown herein four screws, but I do not limit myself to that number. Upon the inner face of the door and, if desirable, forming a portion of the inner step is the plate  $F^4$ , provided with an inwardly-projecting ring  $f$ , having its periphery screw-threaded, as at  $f'$ .  $G$  is a ring having its interior screw-threaded to fit the screw-threads on the ring  $f$ . Working in this ring  $G$  are the bolts  $g$ , having projecting lugs  $g'$ .  $H$  is a covering-plate, (shown in Fig. 8,) by means of which the bolt-ring  $G$  is held in place. This plate  $H$  is provided with slots  $h$  in which the lugs  $g'$  play. The end of each slot is inclined or angled, so that a cam-surface is formed on which the lugs ride. A suitable key, as at  $g^2$ , Fig. 2, prevents the ring  $G$  from revolving after the door is closed. Now by revolving the door, the bolt-ring  $G$  being held against revolution, the lugs will ride in the slots until they strike the inclined end, when they will be forced toward the center, thus drawing in the bolts and releasing the door. In locking the reverse action takes place. The bolts are shot out at the first movement of the door and come to a bearing in the ring  $I$  upon the inner face of the frame. The threaded engagement between the door and ring  $G$  causes the two when the door is revolved to approach each other. The bolts having been at the start shot to their places, the door is bound tightly against the jamb. A lug  $g^3$ , engaged to the ring  $G$  in any suitable manner, the end of which works in the slot or recess  $f^2$ , serves to limit the play of the door with respect to the ring  $G$ . In order that any wear may be compensated for, I make the ring  $I$  adjustable toward or from the frame or jamb. This is accomplished by means of the screws or bolts  $i$ , for carrying the ring toward or holding it to the frame, and the set-screws  $i'$ , for carrying it away from the frame, the two thus coacting to firmly hold the ring in place. A suitable packing  $I'$  may be provided to fill the space between the ring and frame. The screws  $i, i'$  may be arranged in any suitable way; but I prefer to have them alternate around the ring, as in Fig. 7. In order that there may be as little friction as possible between the door and ring  $E'$ , I provide at desirable points the anti-friction rollers  $e^5$ . The periphery of the plate  $F$  is channeled, as at  $e^6$ , and at the points where I desire to place the rollers I provide a circular seat in the channel in which the roller rests. I will now describe the mechanism whereby

the door may be dogged or keyed in its locked position until intentionally released. Extending up from the plate  $F^4$  is the center-post  $F^5$ . (See Fig. 6.) This post may be screwed into the plate, as shown, or it may be an integral part of the plate or be engaged thereto in any suitable way. Within the ring  $f$  and journaled on the post is the plate  $N$ . A spring  $n$  serves to keep the plate normally in the position shown in Fig. 7.  $N'$  is a segment pivoted at  $n'$  to the plate  $N$  and provided on its other end with a post or projection  $N^2$ , which latter extends up through the slot  $h'$  in the covering-plate  $H$ .  $N^3$  is a spring engaged to the plate  $N$  and moving with it.  $O$  is the dogging-latch and is pivoted, as at  $O'$ , to the ring  $f$  and counter-sunk therein. In the adjacent bolt-ring  $G$  is a notch or depression into which the end of the latch or dog may ride, thus locking the door against revolution with respect to the ring  $G$ . A pin  $n^2$  on the plate  $N$  serves to keep the latch normally out of engagement with the ring  $G$ . On the face of the covering-plate  $H$  and pivoted adjacent to the slot  $h'$  is the latch  $H'$ , Figs. 8 to 11, having a spring  $H^2$  to keep it normally in the position shown in Figs. 8 to 11, and a pin  $H^3$  to limit its movement. This latch  $H'$  is provided with the notch or recess  $H^4$  and the arm or tail  $H^5$ . In locking the door the operator first grasps the pin  $N^2$  and moves it around until it reaches the opposite end of the slot  $h'$ , where it is caught and held by the latch  $H'$ . This movement of the pin  $N^2$  revolves the plate  $N$  and carries the pin  $n^2$  away from the latch or dog  $O$ , and at the same time carries the spring  $N^3$  around so that it bears on the end of the dog or latch  $O$ . Connected with the tail  $H^5$  is any suitable time mechanism usually employed in connection with time-locks, whereby at a predetermined time the tail  $H^5$  is thrown over. After setting his time mechanism the operator closes the door to its seat and revolves it. This revolution brings the end of the latch or dog  $O$  around opposite the notch  $g^2$  and the pressure of the spring  $N^3$  forces it into the notch. The door is thus locked or keyed absolutely against revolution until the time-lock forces the tail  $H^5$  around so that the pin  $N^2$  is disengaged, when the spring  $n$  returns the plate and spring  $N^3$  to their normal positions, and the pin  $n^2$  around so that it bears against the latch  $O$  and disengages it from the ring  $G$ . I wish to call particular attention to the form of the latch  $H'$ , the construction being such that when the pin  $N^2$  is engaged and held thereby no amount of jarring or pounding on the door can disengage it. It requires sufficient lateral pressure on the latch to force the pin  $N^2$  down until the lip or teat  $H^6$  on the latch rides over the pin. Instead of the time-lock mechanism just described there may, if desired, be a combination-lock mechanism employed; or, if desired, the door may be provided with a time-lock for night use and a combination-lock for day use. This combina-



tion-lock may be arranged as shown in Fig. 6. A cap or cup-plate P is screwed into the outer plate of the door and the combination-knob  $p$  is on the face of this cap, the spindle  $p'$  extending through to the interior. A bolt  $P'$ , of such length that it may be housed between the screw-cap P and the ring  $E'$ , is kept normally in that position by the spring  $p^2$ . Another bolt  $P^2$  is connected with the combination-spindle and tumblers in the usual way. Now, as will be seen, the revolution of the combination-spindle shoots the bolt  $P^2$ , which, pressing on the bolt  $P'$ , forces the latter out into a suitable recess in the ring  $E'$  and thus locks the door against revolution. When the combination is properly set and the bolt  $P^2$  withdrawn, the bolt  $P'$  is released and the door can be revolved. By this construction the door is dogged by means of a combination-lock without a spindle or shaft of any kind passing into or through the door, which is, obviously, a very material advantage in burglar-proof work. I would also call attention at this point to the fact that the fastenings screws upon the exterior of the door are entirely covered or concealed, and that the rings are rabbeted into each other so that all are bound and held together. Then again, the ring E is slightly let into the plate F to prevent wedging.

What I claim is—

1. In a circular-door safe, the combination, with the door, its locking-bolts carried by the door, and the adjacent frame or jamb, of mechanism permanently connecting the door and bolts, whereby the revolution of the door after it is closed will always operate to shoot the bolts, substantially as described.

2. In a circular-door safe, the combination, with the door, the adjacent frame or jamb, the locking-bolts, and permanent intermediate connecting mechanism, of a stationary stop carried by the frame, which engages and holds a stop carried by the door when the latter is closed, whereby the revolution of the door acts to shoot the bolts, substantially as described.

3. In a circular-door safe, the combination, with the door and the adjacent frame or jamb, of the locking-bolts carried by the door, intermediate mechanism connecting the door and bolts, and a stationary stop on the frame for engaging a stop carried by the door when the latter is closed, whereby the revolution of the door always operates to shoot the bolts, substantially as described.

4. In a circular-door safe, the combination, with the door, its locking-bolts carried by the door and the frame or jamb, of cam mechanism permanently connected with the door for operating the bolts, whereby the revolution of the door causes the cam mechanism to positively operate the bolts, substantially as described.

5. In a circular-door safe, the combination, with the door and the adjacent frame or jamb, of the locking-bolts carried by the door, cam

mechanism engaging the bolts, and stop mechanism permanently connecting the frame or jamb and the cam mechanism when the door is closed, whereby the revolution of the door when it is closed causes the cam mechanism to operate the bolts, substantially as described.

6. In a circular-door safe, the combination, with the door and the adjacent frame or jamb, of the locking-bolts carried by a ring or plate portion of said door movable with respect thereto, mechanism rigidly connected with the door which engages the bolts, and a stop on the frame for engaging the movable ring, substantially as described.

7. In a circular-door safe, the combination, with the door and the adjacent frame or jamb, of the locking-bolts carried by a ring or plate on the door and movable with respect thereto, cam mechanism rigidly connected with the door which engages the bolts, and a stop on the frame for engaging the movable ring, substantially as described.

8. In a circular-door safe, the combination, with the door and the adjacent frame or jamb, of the locking-bolts carried by a ring or plate on the door, said ring or plate engaged to the door by a threaded engagement, cam mechanism rigidly engaged to the door for operating the bolts, and a stop on the frame which engages the bolt-ring, substantially as described.

9. In a circular-door safe, the combination, with the door and the adjacent frame or jamb, of the locking-bolts carried by a ring or plate on the door and movable with respect thereto, a plate rigidly engaged to the door having cam-slots which engage the bolts, and a stop on the frame which engages the movable ring, substantially as described.

10. In a circular-door safe, the combination, with the door and the adjacent frame or jamb, of the locking-bolts carried by a ring or plate which is engaged to the door by a screw-threaded engagement, a plate rigidly engaged to the door having cam-slots which engage and operate the bolts, and a stop on the frame which engages the bolt-ring, substantially as described.

11. In a circular-door safe, the combination, with the door, the adjacent frame or jamb, the locking-bolts carried by said circular door, and mechanism for invariably locking the bolts by the revolution of the door when the latter is closed, of time-lock mechanism for dogging the door in its locked position until intentionally released, substantially as described.

12. In a circular-door safe, the combination, with the door, its frame or jamb, locking-bolts carried by said circular door, and mechanism for invariably operating the bolts by the revolution of the door when the latter is closed, of a combination-lock located on the exterior of the door for dogging the same in its locked position, substantially as described.

13. In a circular-door safe, the combination, with the door, its frame or jamb, and the locking-bolts carried by a ring or plate on the door



and movable with respect thereto, of mechanism for dogging the door and the movable ring together until intentionally released, substantially as described.

5 14. In a circular-door safe, the combination, with the door, of a lever for operating the same, one end of said lever being permanently engaged to the door, while the body of the lever is made extensible, substantially as described.

10 15. In a circular-door safe, the combination, with the door, of a lever for operating the same, said lever consisting of two parts, one telescoping within the other, thus making it extensible, one of said parts being permanently  
15 engaged to the door, substantially as described.

16. In a safe, the combination, with the door, of mechanism for supporting same, consisting of a pair of long arms pivoted to the body of  
20 the safe and extending beyond the center of the door and a pair of returning short arms pivoted to the long arms and to the door, substantially as described.

17. In a safe, the combination, with the door,  
25 of mechanism for supporting the same, consisting of the arms  $D D'$ , pivoted to each other, and the pins  $b$ , extending through the ends of the arms  $D'$  and entering slots in the arms  $D$ , substantially as described.

30 18. In a circular-door safe, the combination, with the door and its supporting hinge-ring, of set-screws between the hinge-ring and adjacent stationary door-ring and bearing upon  
35 the latter, whereby the door may be adjusted in any direction to center it, substantially as described.

19. In a circular-door safe, the combination, with the door and its supporting hinge-ring, of set-screws journaled in said hinge-ring and  
40 having a ball-and-socket bearing in the door-ring, substantially as described.

20. In a circular-door safe, the combination, with the stationary ring  $E'$  and adjacent door, of anti-friction rollers between the ring and  
45 door, substantially as described.

21. In a safe, the combination, with the door and its locking-bolts, of the frame or jamb having a ring or bearing against which the bolts shoot, said bearing being adjustable to-  
50 ward or from the frame, substantially as described.

22. In a circular-door safe, the combination, with the door and its locking-bolts, of the frame or jamb having a ring or bearing against  
55 which the bolts shoot, said ring made adjustable by the bolts  $i$  and set-screws  $i'$ , substantially as described.

23. In a circular-door safe, a time-lock mechanism for dogging the door in its locked position, consisting of a latch or dog on a movable part of the door, an adjacent stationary portion provided with a notch or recess into which the dog rides, and a spring for forcing the dog into the recess, said spring held normally out of contact with the dog but arranged to be brought into contact with it when  
65

it is desired to lock the door, substantially as described.

24. In a circular-door safe, a time-lock mechanism for dogging the door, consisting of a  
70 latch or dog adapted to enter a recess in a stationary part, a movable plate adjacent to the dog, carrying a spring adapted to force the dog into the said recess, and a stop adapted to force the dog out of the recess, the construction being such that a revolution of the  
75 plate in one direction will bring the spring to bear on the dog, and a revolution in the opposite direction will bring the stop to bear on the dog, substantially as described. 80

25. In a circular-door safe, a time-lock mechanism for dogging the door, consisting of the latch or dog, the adjacent stationary portion provided with a notch or recess, the spring for throwing the latch or dog into the notch,  
85 the stop for forcing it out, means for holding the latch-spring abnormally in contact with the latch, and a supplemental spring for carrying the latch-spring out of contact with the latch when released, substantially as described. 90

26. In a circular-door safe, a time-lock mechanism for dogging the door, consisting of a latch or dog, an adjacent stationary portion provided with a notch or recess, a movable  
95 plate carrying a spring for throwing the latch or dog into the notch, and a stop for throwing it out, a spring for holding the plate normally in such a position that the latch-spring exerts no pressure on the latch, and means  
100 for holding the plate so that the latch-spring bears on the latch until released, substantially as described.

27. In a circular-door safe, the combination, with the dogging-latch and latch-spring  
105 mounted on a movable plate held normally so that the latch-spring exerts no pressure on the latch, of means for holding the latch-spring in contact with the latch, consisting of the supplemental latch  $H'$ , adapted to engage and  
110 hold a pin on the movable plate, substantially as described.

28. In a circular-door safe, the combination, with the dogging-latch and latch-spring  
115 mounted on a movable plate, of the latch  $H'$  for holding the latch-spring in contact with the dogging-latch, said latch  $H'$  having the lip or teat  $H^6$ , adapted to engage and hold a pin on the movable plate, substantially as described. 120

29. In a circular-door safe, the combination, with the door, of a combination-lock for dogging the same in its locked position, said combination-lock housed within a cap or cup  
125 screwed into the outer face of the door, substantially as described.

30. In a circular-door safe, the combination, with the door, of a bolt housed therein adjacent to the edge and adapted to enter a notch or recess in the adjacent frame, a spring for  
130 holding said bolt normally within the confines of the door, and a combination-lock upon the



exterior of the door, adapted to force the dogging-bolt out into the frame, substantially as described.

5 31. In a circular-door safe, the combination, with the door, of the rings upon the exterior thereof, said rings rabbeted into each other, and the bolts or screws which secure the inner plate or ring to the door being covered by a screw-cap, the latter being dogged against

revolution when the door is closed, substantially as described.

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

THOMAS M. BRINTNALL.

Witnesses:

W. H. CHAMBERLIN,  
JNO. W. NORRIS.