

No. 788,103.

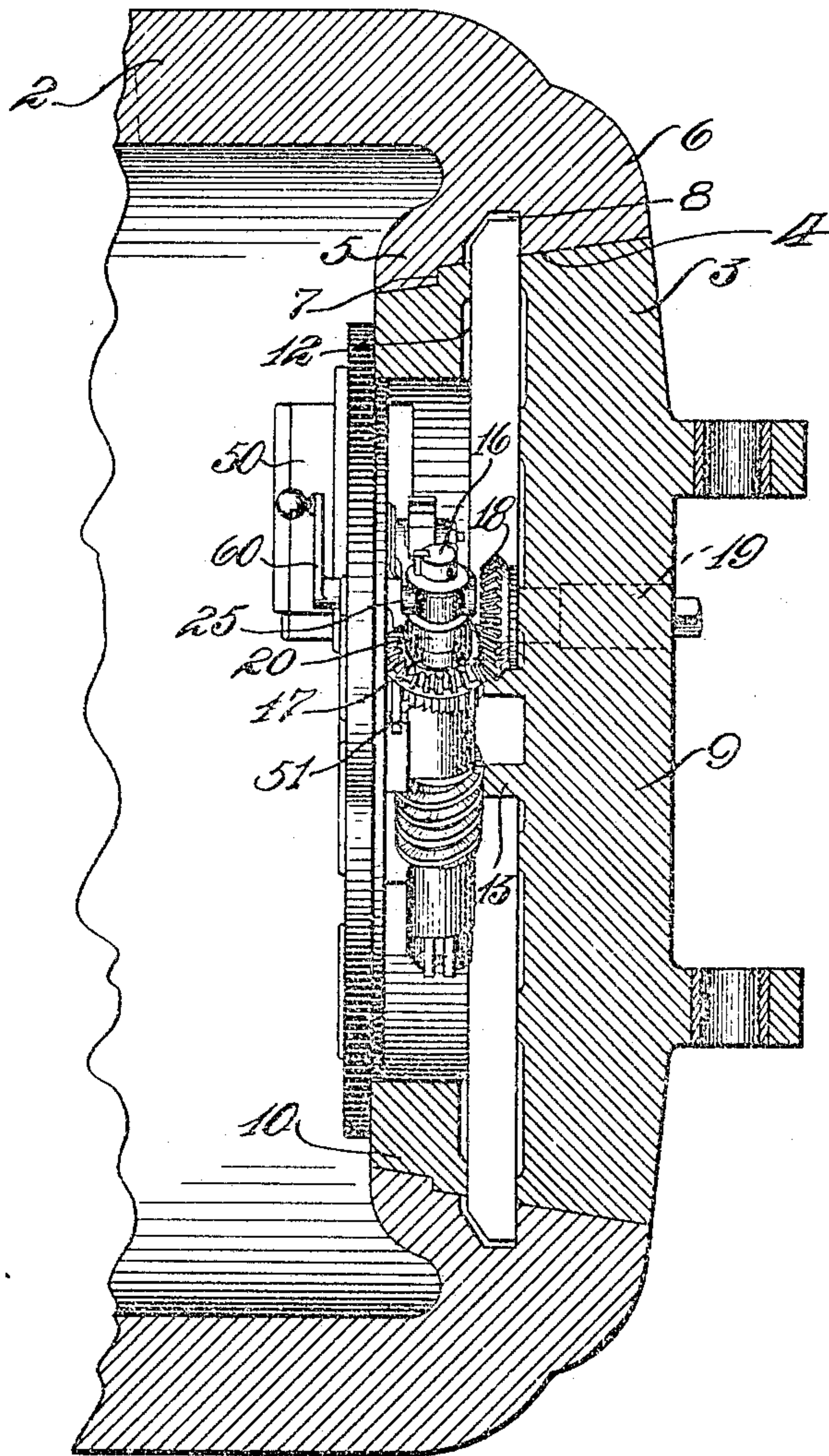
PATENTED APR. 25, 1905.

H. D. HIBBARD.  
SAFE OR VAULT.

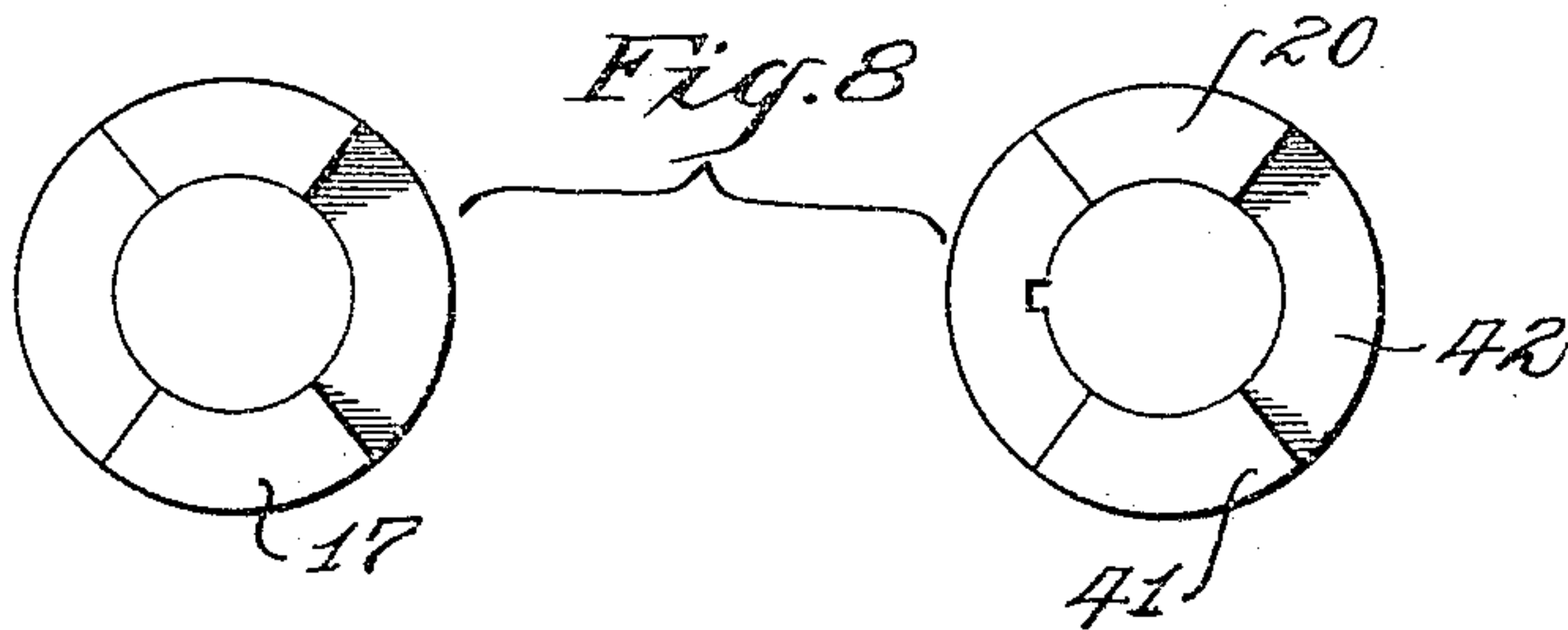
APPLICATION FILED AUG. 19, 1903.

4 SHEETS—SHEET 1.

*Fig. 1.*



*Fig. 8*



*Witnesses:*

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*Inventor:*

*Henry D. Hibbard,*  
*By his Attorney*

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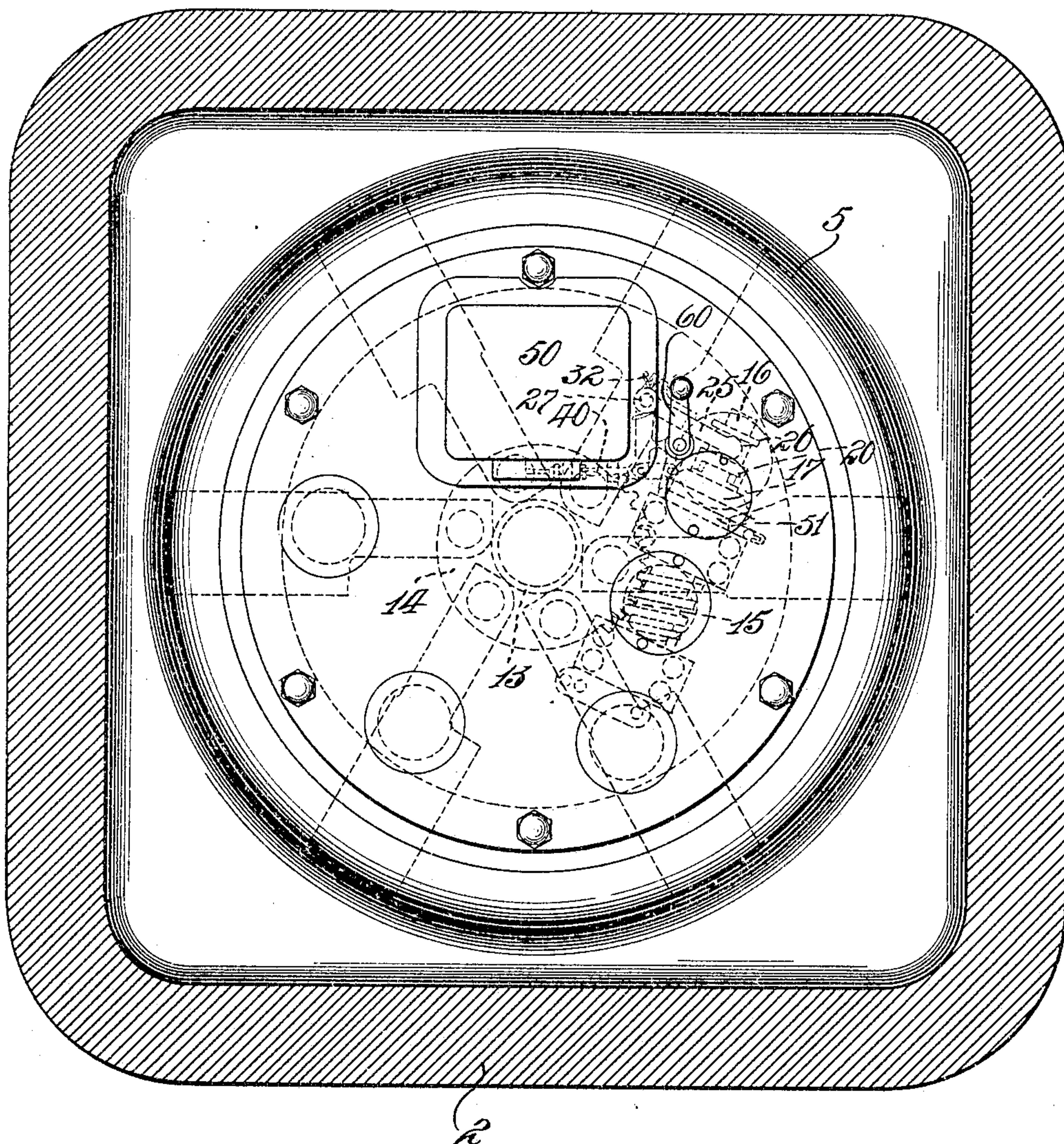
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4 SHEETS—SHEET 2.

*Fig. 2.*



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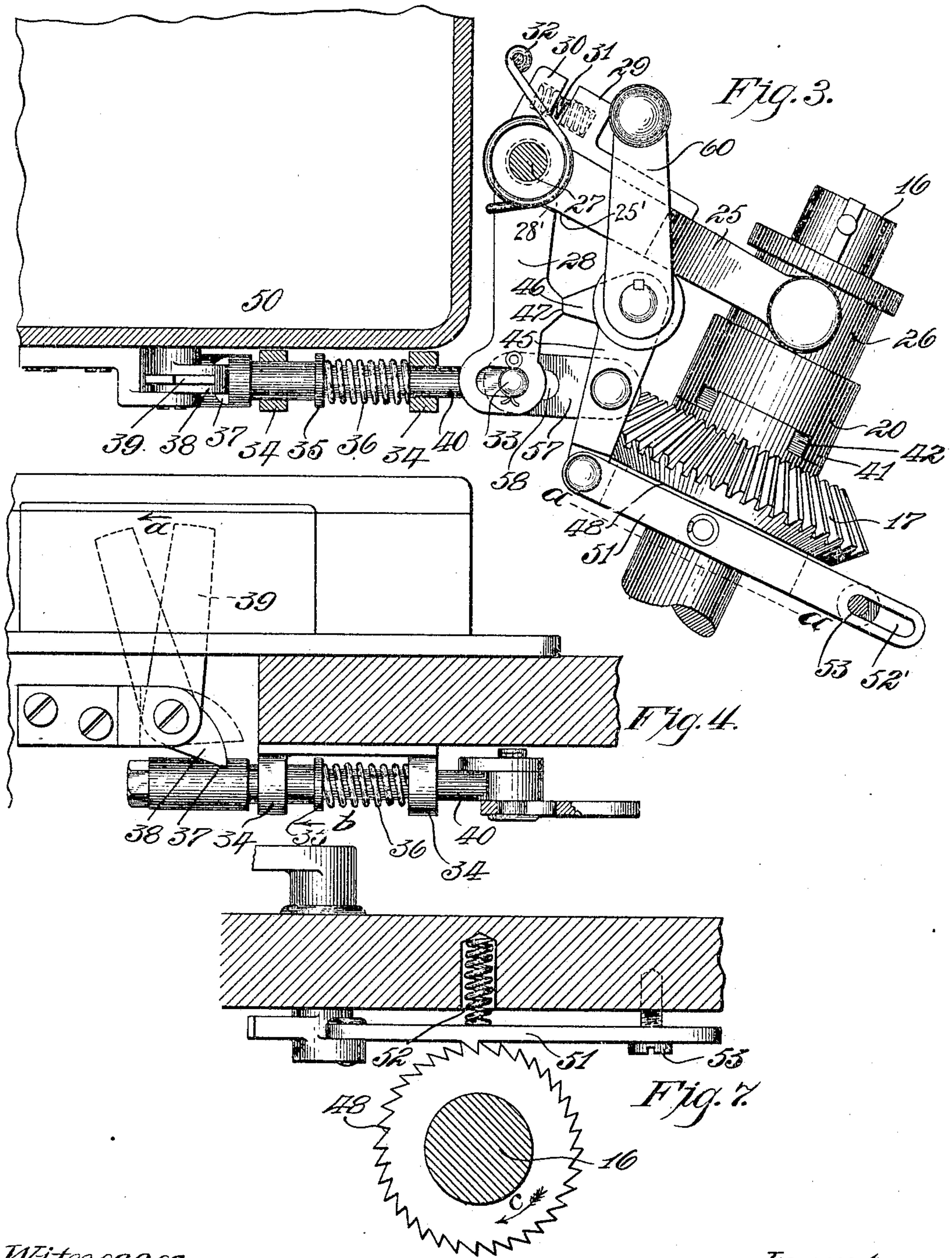
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4 SHEETS--SHEET 3.



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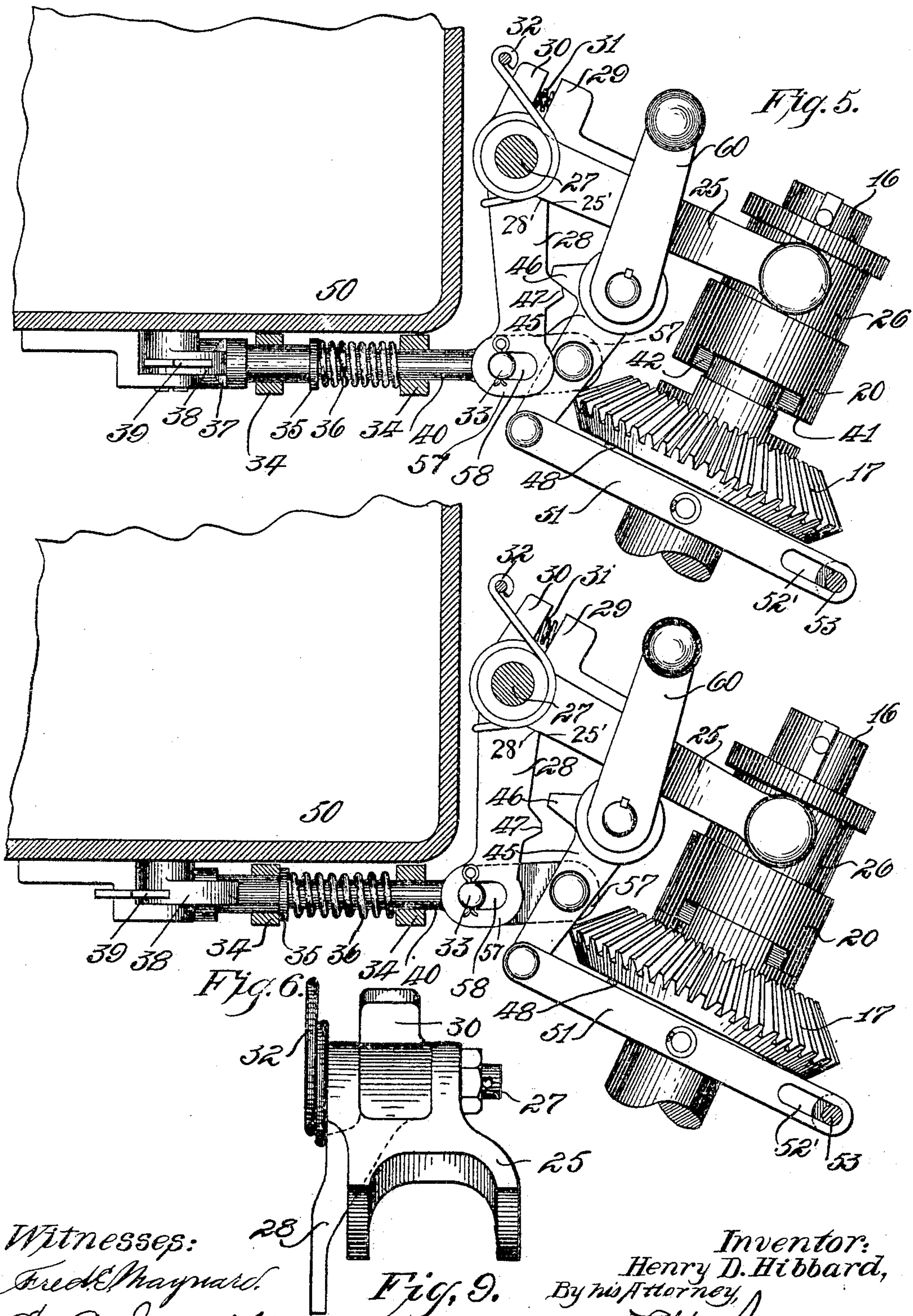
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H. D. HIBBARD.  
SAFE OR VAULT.

APPLICATION FILED AUG. 19, 1903.

4 SHEETS—SHEET 4.



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# UNITED STATES PATENT OFFICE.

HENRY D. HIBBARD, OF PLAINFIELD, NEW JERSEY, ASSIGNOR TO MANGANESE STEEL SAFE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

## SAFE OR VAULT.

SPECIFICATION forming part of Letters Patent No. 788,103, dated April 25, 1905.

Application filed August 19, 1903. Serial No. 169,962.

*To all whom it may concern:*

Be it known that I, HENRY DEMING HIBBARD, a citizen of the United States, residing in Plainfield, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Safes or Vaults, of which the following is a specification.

This invention relates to safes or vaults; and it more particularly relates to the locking or bolting mechanism thereof, the object of the invention being to provide an improved safe or vault the door of which is maintained in its seat by bolting mechanism controlled by means projecting through the wall of the safe, which same means is also effective to so operate the mechanism that the further operation of the bolts thereby cannot be effected until a predetermined period.

A further object of the invention is the provision of locking or bolting mechanism controlled by a single spindle, which is also operative to effect disconnection of part of the bolt-operating means, thereby to prevent the bolt-work from being operated except at a predetermined period.

A further object of the invention is the provision of an improved safe or vault employing but a single spindle in connection with a time-lock for controlling the operation of the bolting mechanism, such spindle also controlling means for preventing the operation of the bolts until the time-lock operates such controlling means.

One of the principal features of the present invention is the provision of a safe or vault in which the door, whatever may be its particular means for locking such door in its seat, is under the control of a single spindle, the rotation of which in one direction will effect the locking of such door, while the rotation thereof in an opposite or reverse direction will prevent the door from being unlocked until a predetermined time.

In the drawings accompanying and forming part of this specification, Figure 1 is a sectional view of a part of a safe and its door, the latter closed, with this improved mechanism located thereon. Fig. 2 is a cross-sectional view of the safe looking at the inner

side of the door. Fig. 3 is a detail view of the bolt-controlling means in that position which permits the door to be closed and bolted. Fig. 4 is a detail view of a part of such bolt-controlling means, illustrating more particularly its connection with the time-lock. Fig. 5 is a detail view of the bolt-controlling means in that position which the parts assume after the door is bolted and the spindle has been operated to make disconnection of the parts to prevent further operation of such bolts by the spindle. Fig. 6 is also a detail view of the bolting mechanism in that position which the parts assume after the time-lock has run down, at which time the manipulation of the spindle will withdraw the bolts. Fig. 7 is a sectional view taken in line *a a*, Fig. 3, looking from the under side thereof; and Fig. 8 is a detail view of the clutch members detached. Fig. 9 is a detail perspective view of the clutch-operating means.

Similar characters of reference indicate corresponding parts throughout the several figures of the drawings.

The present improvement has for its object more particularly the provision of a burglar-proof safe or vault in which the bolting mechanism for maintaining the door in its seat is controlled by a single spindle, thus obviating the necessity of providing two or more spindles passing through the wall—as, for instance, the door of the safe. In the safes heretofore patented by me several spindles have been used, one of which operated the bolts. In the present instance I utilize this bolt-operating spindle not only to manipulate the bolts, but also to operate the mechanism after the bolts have been properly thrown, so that the retraction of such bolts cannot be effected by the spindle, such spindle thus having a duplex function—namely, to throw or retract the bolts and to effect a disconnection of the operating mechanism whereby the bolts cannot be retracted except at a predetermined period—such, for instance, as when the time-lock mechanism has run down, which will operate to reestablish connection of the parts and permit the spindle to retract the bolts and unlock the door.



The safe or vault comprises a body 2 and a door 3 of any suitable construction, but preferably similar to that heretofore patented by me in which the body is provided with an elongated jamb 4, formed by a pair of beads or projections 5 and 6, and which jamb has a suitable offset or step 7 and bolt-receiving recess or groove 8. The door comprises a body 9 and a flange 10, the latter having suitable bolt-receiving openings 12 and a centrally-located boss 13, adapted to cooperate with the inner ends of the bolts to prevent their withdrawal except by a rocking movement thereof, and which bolts work in the openings 12 with their inner ends connected to a rotary disk 14, provided with worm-teeth 15 in engagement with a worm-shaft 16, carrying at one end a bevel-gear 17. When this shaft is rotated, the disk 14 will be partially rotated and the bolts withdrawn or protracted, as the case may be. For rotating this worm-shaft 16 I provide suitable clutch mechanism, one member of which forms part of the bevel-gear 17, in mesh with a bevel-gear 18, located on the inner end of the actuating device or operating-spindle 19, passing through the door and squared on its outer end to receive a suitable crank. The bevel-gear clutch member is loosely mounted upon the worm-shaft 16, so that the turning of the spindle will merely rotate this gear without imparting movement to shaft and bolts, to effect which the companion clutch member 20 is splined or keyed to the worm-shaft 16. When the clutch members are in engagement, the rotation of the geared clutch member will rotate the shaft, thereby to retract or protract the bolts. To prevent the rotation of this worm-shaft by means of the gear when the bolts have been thrown and to effect the reengagement of such clutch members on the running down of the time-lock mechanism, it is necessary that suitable mechanism be provided. The mechanism which in the preferred form thereof herein shown and described is adapted to accomplish this purpose comprises a member or lever 25, having a forked end in engagement with the sleeve or collar 26 of the sliding clutch member 20, its opposite bifurcated end being mounted on a short shaft 27, having also mounted thereon between the furcated ends of the member 25 member or lever 28. Each of these members 25 and 28 is provided with an extension or arm 29 and 30, respectively, between which is located a spring 31, the tendency of which is to force the sliding clutch member into engagement with the geared clutch member through the medium of the member 25. The member 28 has a stop-face 28', adapted to engage a stop-face 25' of the member 25 and move the latter, with its clutch member, away from the bevel-gear clutch member at the proper time. From the foregoing it will be seen that the member 25 is movable independently of the member 28.

To separate the clutch members, a spring 32 is provided effective to force the arm 28 to the right, Fig. 5, and thereby the arm 25, through the medium of the stop-faces 25' and 28', hereinbefore referred to, with its clutch member, away from the lower clutch member.

The spring 31 could be dispensed with, if desired, as it is not essential, although it is of some use under certain conditions to prevent strain on the clutch-shifter, and the main features of this improvement still be present without the necessity of making levers or arms 25 and 28 as separate members. In fact, the various details could be more or less departed from without changing or effecting the scope of this invention.

Projecting into the slotted end of the member 28 is a pin or projection 33, secured to one end of a plunger 40, having mounted thereon between a fixture or bracket 34 and a collar 35 a spiral spring 36, a part of said plunger being formed with a notch 37 for the reception of a suitable catch 38, having an arm 39 in operative connection with the time-lock mechanism 50. The time-lock mechanism (not shown in detail) is effective, as it runs down to throw the catch 38 in the direction of the arrow *a* to release the catch from the plunger 40, whereupon the plunger is thrown by its spring in the direction of the arrow *b* and throws the member 28 to the left, Fig. 6, thus permitting the spring 31 to move the member 25 so that the clutch members are brought into engagement. Should the position of the two-clutch members be such, however, that the teeth 41 thereof will not pass into engagement, the spring 31 will maintain the parts in close engagement, so that as the bevel-gear, with its clutch member, is rotated the sliding clutch member will be moved into position sooner or later to engage its companion clutch member, and thereby permit the operation of the bolts. When, however, the spring 31 is not used, this result is obtained by the spring 36, in which case the arms 25 and 28 would be rigid with each other.

To maintain the meshing of the clutch members and permit the bolts to be properly thrown to lock the safe by the operation of the spindle when the plunger is locked in its retracted position, at which time ordinarily the clutch members would be disengaged, suitable means is provided, comprising in the present instance a stop member 45 having a stop-surface 46 cooperating with a stop-surface 47 on the arm 28 and effective when such arm is thrown to the right on the retracting of the plunger to force the arm 28 to the left and hold it there against the action of the spring 32, and thus hold the clutch members engaged. As long as these stop-surfaces 46 and 47 are in engagement the clutch members will be maintained in mesh, and consequently the bolts can be thrown or retracted, and to



prevent this suitable means are provided comprising a ratchet-disk 48, mounted on the worm-shaft 16 and shown herein as forming a part of the bevel-gear 17. A pawl 51 in the form of a lever is held in engagement with said ratchet-disk by a spiral spring 52 and has a slot 52' at one end for the reception of a suitable guide pin or screw 53, its opposite end being connected to the stop member 45, the upper end of which is fulcrumed to a shaft or stud. On turning the spindle in one direction the worm-shaft will be rotated, the bolts thrown out, and the ratchet turned in the direction of the arrow *c*, Fig. 7, thus permitting the pawl to slip over the teeth of such ratchet. After the bolts have been fully thrown a reverse movement of the spindle rotates the ratchet-disk in the opposite direction and shifts the pawl-lever, which is permitted by its slot, thus throwing lower part of member 45 to the left, and thereby the stop-surface 46 from the stop-surface 47 of the arm 28, thereby permitting the spring 32 to shift the arm 28 to the right, Fig. 5, and through the medium of the stop-faces 25' and 28' on said arms 25 and 28 shift the arm 25 to disengage the clutch members. The relatively long spaces 42 between the clutch-teeth 41 give sufficient play or loose motion to permit this reverse movement of the spindle without withdrawing the bolts. When it is desired to withdraw the bolts, the clutch members being in engagement, the organization is such, as will be observed, that when the pawl-lever has been shifted as far as possible it will not interfere with the rotary movement of the spindle to retract the bolts, since the pawl-tooth will have been pushed sufficiently far to the left, Fig. 7, to permit the ratchet to pass away from it. From this it will be seen that the same spindle which throws the bolts when the clutch members are in engagement also controls the separation of such clutch members when the bolts have been completely thrown.

To set the mechanism so that on the closing and bolting of the door it cannot be opened except when the time-lock runs down, the stop member 45 is connected by a suitable link 57 with the plunger 40, it having a slot 58 working upon the pin 33, so that when the pawl-lever is moved into the position shown in Fig. 5 this slot permits movement of the link upon such pin 33 without effecting the position of plunger 40. For operating this stop member 45 to set the mechanism a suitable crank or handle 60 is provided.

In the operation of setting the mechanism, the door being open, the handle 60 is moved into the position shown in Fig. 3, thereby moving the stop member 45 into the position shown in said Fig. 3, whereupon the link 57 pulls the plunger 40 against the resistance of its spring into the position shown in said Fig. 3 to permit the catch 38 to fall into position

and lock the plunger in such position. At this time, of course, the stops 46 and 47 will be engaged and the clutch members also in engagement. The door is then closed, and on the operation of the bolt-spindle in the proper manner the bolts will be thrown to bolt the door. After the door is closed the spindle is reversed, thereby turning the ratchet-disk in the opposite direction to shift the pawl-lever, as hereinbefore set forth, thus disengaging the stops 46 and 47 and the clutch members, Fig. 5, so that the rotation of the bevel-gears by the spindle will not have any effect upon the bolts. When the time-lock runs down, it throws the catch 38 into the dotted-line position, Fig. 4, releasing the plunger, which moves into the position shown in Fig. 6, carrying the arm 28 with it, which throws the two clutch members into engagement, so that the rotation of the spindle will withdraw the bolts. To prevent the opening of the safe at this time or during the day when the time-lock is off, a suitable combination-lock mechanism may be used locking the hinge or door of the safe.

From the foregoing it will be seen that by a comparatively simple mechanism and by the use of one spindle only the bolts may be either retracted or thrown out and mechanism also operated to prevent the operation of the bolts by this same spindle.

The single-spindle principle could be used with various forms of doors and with various forms of locking or bolting means for maintaining such doors in their seats and could also be used with rotary doors, the rotation of such spindle in one direction serving to lock the door against rotation after it is properly seated, while the rotation thereof in an opposite or reverse direction acting, either through a positive connection or otherwise, as in the present case, to dog or prevent the unlocking of such door until a predetermined period, which may be determined by the use of a suitable automatic or time lock similar to that shown and described herein, if preferred.

To prevent the rotation of the worm-shaft by vibration, some suitable dogging or locking means may be used, similar, if desired, to any of those shown in my contemporaneously-pending applications, Serial No. 173,237, filed September 15, 1903, and Serial No. 182,952, filed November 28, 1903.

Having thus described my invention, I claim—

1. In a safe or vault the combination of a body having a doorway, a door therefor, a set of bolts, a worm-wheel having connection with each of said bolts, a worm in engagement with said worm-wheel, clutch mechanism for controlling the movement of said worm and thereby the bolts, a time-lock, means controlled thereby and effective to throw the clutch members into operative connection, and means for actuating said bolts through said



clutch mechanism and also operative to effect the disengagement of said clutch members.

2. In a safe or vault, the combination of a body having a doorway, a door therefor, locking mechanism for the door, mechanism embodying clutch mechanism operatively connected with said locking mechanism, and means for operating said locking mechanism through the clutch mechanism, and also operative to effect the disengagement of the clutch members.

3. A safe or vault door bolting mechanism comprising bolts, mechanism for throwing and retracting said bolts including a bolting-spindle, which same spindle is also effective to throw a part of the mechanism out of operative connection thereby to prevent the operation of said bolts by said spindle, means intermediate said spindle and said part and lock mechanism for controlling a part of the mechanism, said bolting-spindle being separate from such lock mechanism.

4. In a safe or vault, the combination of a body, a door therefor, locking mechanism for the door, a spindle coöperating with said locking mechanism to lock or unlock the door, and which same spindle is also operative to effect a disconnection of some of the operating parts thereby to prevent the unlocking of the door by said spindle, means through which said spindle operates to effect such disconnection and automatically operative means effective to restore the connection between such operating parts thereby to permit the unlocking of the door through the medium of said spindle.

5. In a safe or vault, the combination of a body, a door therefor, locking mechanism for the door, means for actuating said locking mechanism to lock or unlock the door, said actuating means also being effective to disconnect some of the operating parts thereby to prevent the unlocking of the door, and lock mechanism controlling the effectiveness of such actuating means at one period, but over the operation of which the latter has no control.

6. In a safe or vault, the combination of a body, a door therefor, locking mechanism for the door, a single actuating device for operating the locking mechanism to lock or unlock the door, means connecting said device with such locking mechanism, said actuating device also being effective to disconnect certain of the operating parts thereby to prevent the locking mechanism from being operated to unlock the door, and lock mechanism, said actuating device not being effective to operate such lock mechanism.

7. In a safe or vault, the combination of a body having a doorway, a door therefor, locking mechanism for the door, time-lock mechanism for controlling the operation of said locking mechanism, a single actuating device for operating said locking mechanism thereby to lock or unlock the door and also effective

to throw some of the operating parts out of connection thereby to prevent the unlocking of the door except on the running down of the time-lock mechanism and means for establishing connection between said device and the locking mechanism.

8. In a safe or vault, the combination of a body having a doorway, a door therefor, locking mechanism for the door, a single actuating-spindle for operating said locking mechanism to lock or unlock the door, and also effective after the locking of the door to throw certain of the operating parts out of connection thereby to prevent the unlocking of the door, means for making connection between said spindle and the locking mechanism, and time-lock mechanism effective at a predetermined period to permit the unlocking of the door by such single actuating-spindle.

9. In a safe or vault the combination with a body having a doorway, of a door therefor, bolting mechanism for the door, means for operating the bolting mechanism and embodying a pair of clutch members, time-lock mechanism for controlling the engagement of said clutch members, a single actuating means for actuating the bolts and for controlling said clutch members to prevent the engagement thereof except at a predetermined period through the medium of the time-lock mechanism and means through the medium of which said spindle acts to prevent such engagement.

10. In a safe or vault, the combination of door-locking mechanism including an actuating device effective to lock the door, and which same device is also effective to interfere with the unlocking of the door except at a certain time, means through which said device operates to accomplish such interference, and time-lock mechanism controlling the effectiveness of the actuating device at one period.

11. In a safe or vault, the combination with a body having a doorway, of a door therefor, locking means for the door, means for controlling said locking means, a manually-operated actuating means for actuating said controlling means to unlock the door and also to so shift the parts that the unlocking of the door is prevented by said actuating means except at a predetermined period, and automatic mechanism for throwing the controlling means into position to permit the operation of the locking means by said actuating means.

12. In a safe or vault, the combination with a body having a doorway, of a door therefor, a set of bolts, means for operating said bolts and embodying a spindle other than a combination-lock spindle, effective on rotation in one direction to operate the bolts and effective on rotation in the opposite direction to interfere with the operation of such bolts.

13. In a safe or vault, the combination with a body having a doorway, of a door therefor, a set of bolts, means for operating said bolts



and embodying a pair of clutch members, and a single spindle, time-lock mechanism, means controlled thereby for throwing said clutch members into operative connection, and means effective on the operation of said spindle in one direction to prevent the engagement of said clutch members other than through the medium of the time-lock mechanism.

14. In a safe or vault, the combination of a body having a doorway, of a door therefor, a set of bolts, means for operating said bolts comprising gear mechanism and a pair of clutch members, a spindle for operating said gear mechanism, time-lock mechanism for controlling the operation of said clutch members, and means controlled by said spindle for interfering with the connection of said clutch members except through the medium of said time-lock mechanism.

15. In a safe or vault, the combination with a body having a doorway, of a door therefor, a set of bolts, means for operating said bolts and embodying a pair of clutch members, time-lock mechanism for controlling the connection of such clutch members, a dog operatively connected with the time-lock mechanism, a spring-actuated plunger cooperating with said dog, lever mechanism connected with said spring-actuated plunger and with one of said clutch members and effective to make connection of the clutch members on the release of the plunger by the dog, and means for disengaging said clutch members after the locking of the door.

16. In a safe or vault, the combination with a body having a doorway, of a door therefor, a set of bolts, means for operating said bolts and embodying a pair of clutch members, time-lock mechanism for controlling the connection of such clutch members, a dog operatively connected with the time-lock mechanism, a spring-actuated plunger cooperating with said dog, lever mechanism connected with said spring-actuated plunger and with one of said clutch members and effective to make connection of the clutch members on the release of the plunger by the dog, and means for effecting the relocking of said plunger.

17. In a safe or vault, the combination with a body having a doorway, of a door therefor, a set of bolts, means for operating said bolts and embodying a pair of clutch members, time-lock mechanism for controlling the connection of such clutch members, a dog operatively connected with the time-lock mechanism, a spring-actuated plunger cooperating with said dog, lever mechanism connected with said spring-actuated plunger and with one of said clutch members and effective to make connection of the clutch members on the release of the plunger by the dog, means for disengaging said clutch members after the locking of the door, and means for effecting the relocking of said plunger.

18. In a safe or vault, the combination with

a body having a doorway, of a door therefor, a set of bolts, means for operating said bolts and embodying a pair of clutch members, time-lock mechanism for controlling the connection of such clutch members, a dog operatively connected with the time-lock mechanism, a spring-actuated plunger cooperating with said dog, lever mechanism connected with said spring-actuated plunger and with one of said clutch members and effective to make connection of the clutch members on the release of the plunger by the dog, means for effecting the relocking of said plunger, and means effective to maintain the clutch members in engagement while the plunger is in its locked position.

19. In a safe or vault, the combination with a body having a doorway, of a door therefor, a set of bolts, means for operating said bolts and embodying a pair of clutch members, time-lock mechanism for controlling the connection of such clutch members, a dog operatively connected with the time-lock mechanism, a spring-actuated plunger cooperating with said dog, lever mechanism connected with said spring-actuated plunger and with one of said clutch members and effective to make connection of the clutch members on the release of the plunger by the dog, and means for disengaging said clutch members after the locking of the door and comprising a stop member and pawl-and-ratchet means.

20. In a safe or vault, the combination with a doorway of a door therefor, a set of bolts, means for operating said bolts and including a spindle and a pair of clutch members, time-lock mechanism for controlling the connection of said clutch members, means connecting the time-lock mechanism with one of the clutch members, and stop mechanism effective to maintain the clutch members in engagement.

21. In a safe or vault, the combination with a doorway of a door therefor, a set of bolts, means for operating said bolts and including a spindle and a pair of clutch members, time-lock mechanism for controlling the connection of said clutch members, means connecting the time-lock mechanism with one of the clutch members, stop mechanism effective to maintain the clutch members in engagement, and means controlled by said spindle for operating said stop mechanism.

22. In a safe or vault, the combination with a doorway, of a door therefor, a set of bolts, means for operating said bolts and including a spindle and a pair of clutch members, time-lock mechanism for controlling the connection of said clutch members, means connecting the time-lock mechanism with one of the clutch members, stop mechanism effective to maintain the clutch members in engagement, and a handle for operating said stop mechanism.

23. In a safe or vault, the combination with a doorway of a door therefor, a set of bolts, means for operating said bolts and including a spindle and a pair of clutch members, auto-



matic mechanism for controlling the connection of said clutch members, means connecting the automatic mechanism with one of the clutch members, means effective to maintain the clutch members in engagement, to permit the retraction or protraction of the bolts, and means controlled by said spindle for shifting said means after the door is locked.

24. In a safe or vault, the combination with a doorway of a door therefor, a set of bolts, means for operating said bolts and including a spindle and a pair of clutch members, time-lock mechanism for controlling the connection of said clutch members, means connecting the time-lock mechanism with one of the clutch members, stop mechanism effective to maintain the clutch members in engagement, and means controlled by said spindle for operating said stop mechanism after the door is locked and comprising a pawl-and-ratchet mechanism.

25. In a safe or vault, the combination with a body having a doorway, of a door therefor, a set of bolts, means for operating said bolts and embodying a pair of clutch members, time-lock mechanism for controlling the connection of such clutch members, a dog operatively connected with the time-lock mechanism, a spring-actuated plunger coöperating with said dog, lever mechanism, comprising a pair of levers connected for movement together and independently of each other, connected with said spring-actuated plunger and with one of said clutch members and effective to make connection of the clutch members on the release of the plunger by the dog, and means for disengaging said clutch members after the locking of the door.

26. In a safe or vault, the combination with a body having a doorway, of a door therefor, a set of bolts, means for operating said bolts and embodying a pair of clutch members, time-lock mechanism for controlling the connection of such clutch members, a dog operatively connected with the time-lock mechanism, a spring-actuated plunger coöperating with said dog, lever mechanism, comprising a pair of levers connected for movement together and independently of each other, connected with said spring-actuated plunger and with one of said clutch members and effective to make connection of the clutch members on the release of the plunger by the dog, and means for disengaging said clutch members after the locking of the door and comprising stop mechanism effective to coöperate with one of said levers and maintain engagement of said clutch members during the locking of the door.

27. The combination with a safe or vault door bolting mechanism, of a spindle for shifting the bolts, automatic means for making connection between the bolts and spindle to permit the bolts to be retracted on the turning of such spindle, and means free of control by said automatic means and operative when

the bolts are protracted to break connection between said spindle and the bolts, thereby to interfere with the retraction of the bolts by the spindle until the operation of said automatic means.

28. The combination with a safe or vault door bolting mechanism, of a spindle for shifting the bolts, automatic means for automatically making connection between the bolts and spindle to permit the bolts to be retracted on the turning of such spindle, and means operative through the medium of the spindle when the bolts are protracted to break connection between said spindle and the bolts, thereby to interfere with the retraction of the bolts by the spindle until the operation of said automatic means.

29. The combination with a safe or vault door bolting mechanism, of a spindle for shifting the bolts, automatic means for automatically making connection between the bolts and spindle to permit the bolts to be retracted on the turning of such spindle, and manually-operated means operative when the bolts are protracted to break connection between said spindle and the bolts, thereby to interfere with the retraction of the bolts by the spindle until the operation of said automatic means.

30. The combination of a safe or vault door bolting mechanism comprising bolts, worm-gearing for imparting movement to said bolts, a spindle effective to shift the bolts through the medium of said worm-gearing, automatic means for automatically making connection between the worm-gearing and the spindle to permit the bolts to be retracted on the turning of such spindle, and means operative when the bolts are protracted to break connection between such spindle and the worm-gearing.

31. The combination of a safe or vault door bolting mechanism comprising bolts, worm-gearing for shifting said bolts, clutch mechanism, a spindle effective to shift the bolts through the medium of the worm-gearing when the clutch members are in mesh, automatic means for making connection between the clutch members thereby to enable the spindle to operate the worm-gearing to retract the bolts on the turning of such spindle, and means operative by the spindle when the bolts are protracted to break connection between said clutch members and thereby between the spindle and the worm-gearing to prevent the retraction of the bolts by the spindle.

32. The combination of bolting mechanism, a spindle for shifting the bolts, automatic means for automatically connecting up the spindle with the bolts to permit the withdrawal of the bolts by the spindle, and means effective after the bolts are protracted to break connection between said spindle and bolts thereby to prevent the operation of the bolts by the spindle until the operation of said auto-



matic means, said means being operated on the rotation of the spindle in one direction.

33. The combination of bolts, worm-gearing connected with the bolts, a spindle for actuating said worm-gearing, automatic means for connecting up the spindle with said worm-gearing and including an automatically-operated device, clutch mechanism, a clutch-shifter between said device and clutch mechanism, and means operated by the spindle for breaking connection of certain parts to prevent retraction of the bolts by the spindle.

34. The combination of bolts, worm-gearing connected with the bolts, a spindle for actuating said worm-gearing, automatic means for connecting up the spindle with said worm-gearing and including an automatically-operated device, clutch mechanism, a clutch-shifter between said device and clutch mechanism, and means including pawl-and-ratchet mechanism for effecting disengagement of certain parts to prevent retraction of the bolts by the spindle, said means being operative by the spindle on the turning thereof in a direction reverse to that for shifting the bolts.

35. A safe or vault door having mechanism including a spindle other than a combination-lock spindle, the rotation of which in one direction secures the door to its seat, while the rotation thereof in the opposite direction actuates means to prevent the door from being shifted relatively to its seat.

36. A safe or vault door provided with mechanism including a spindle, the rotation of which in one direction results in securing the door to its seat, while the rotation thereof in the opposite direction results in preventing the door from being shifted relatively to its seat, until a predetermined period and automatically-operative means operative to control the effectiveness of said spindle after the door is secured in its seat.

37. In a safe or vault, the combination of a body, a door therefor, locking mechanism for the door, and a spindle other than a combination-lock spindle, coöperating with said locking mechanism and effective on the rotation thereof in one direction to lock the door against movement relatively to its seat, and effective on its movement in an opposite direction to prevent the operation of said locking mechanism until a predetermined period determined automatically.

38. A safe or vault door having mechanism including a spindle, the rotation of which in one direction is effective to secure the door to its seat, while the rotation thereof in the other direction immediately after the door is locked in its seat is effective to prevent the unlocking of the door until a predetermined period.

HENRY D. HIBBARD.

Witnesses:

C. A. WEED,  
R. JACKSON.