

No. 788,106.

PATENTED APR. 25, 1905.

H. D. HIBBARD.
ACTUATOR LOCKING MECHANISM FOR SAFES OR VAULTS.

APPLICATION FILED NOV. 28, 1903.

2 SHEETS—SHEET 1.

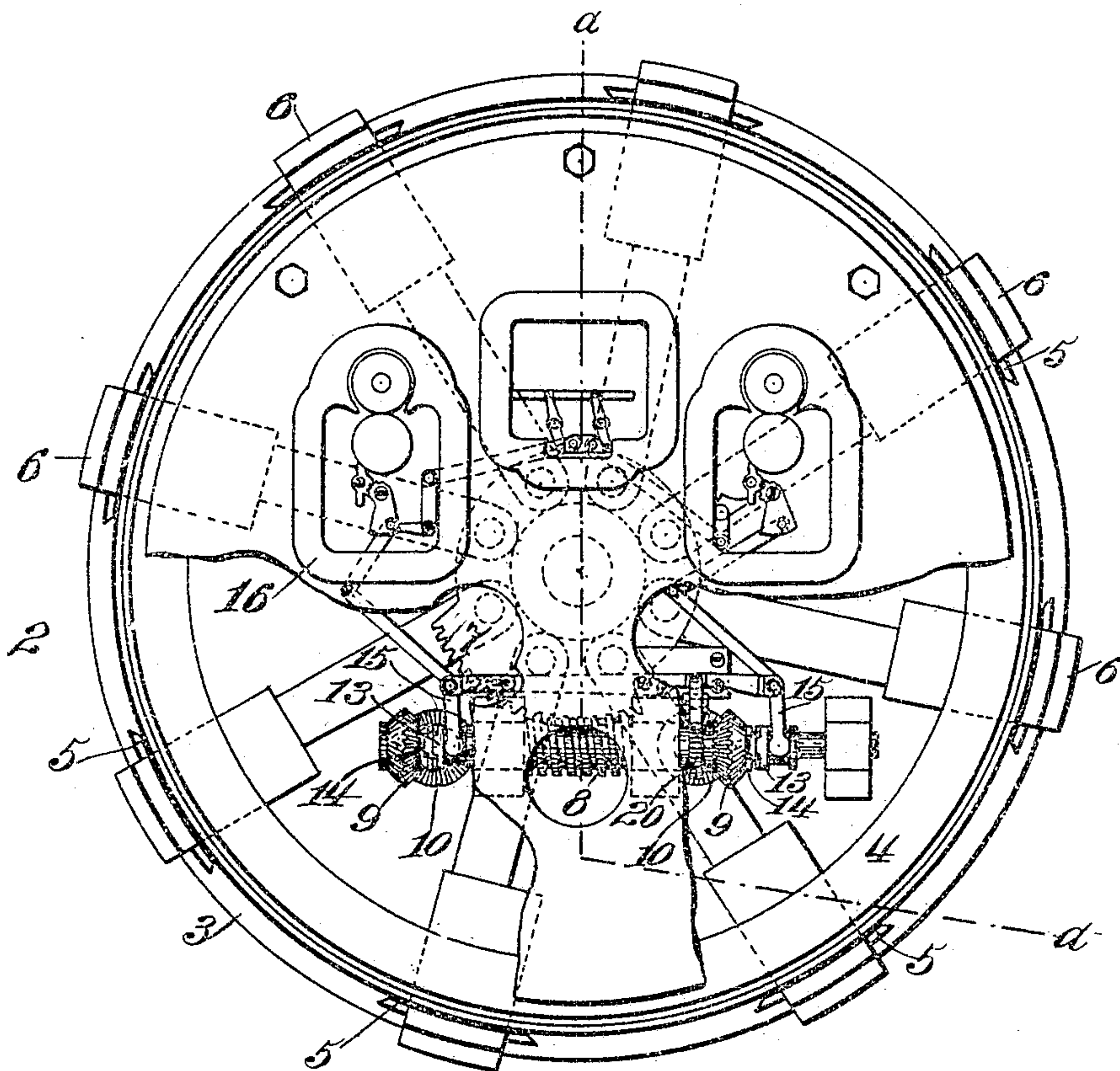


Fig. 1

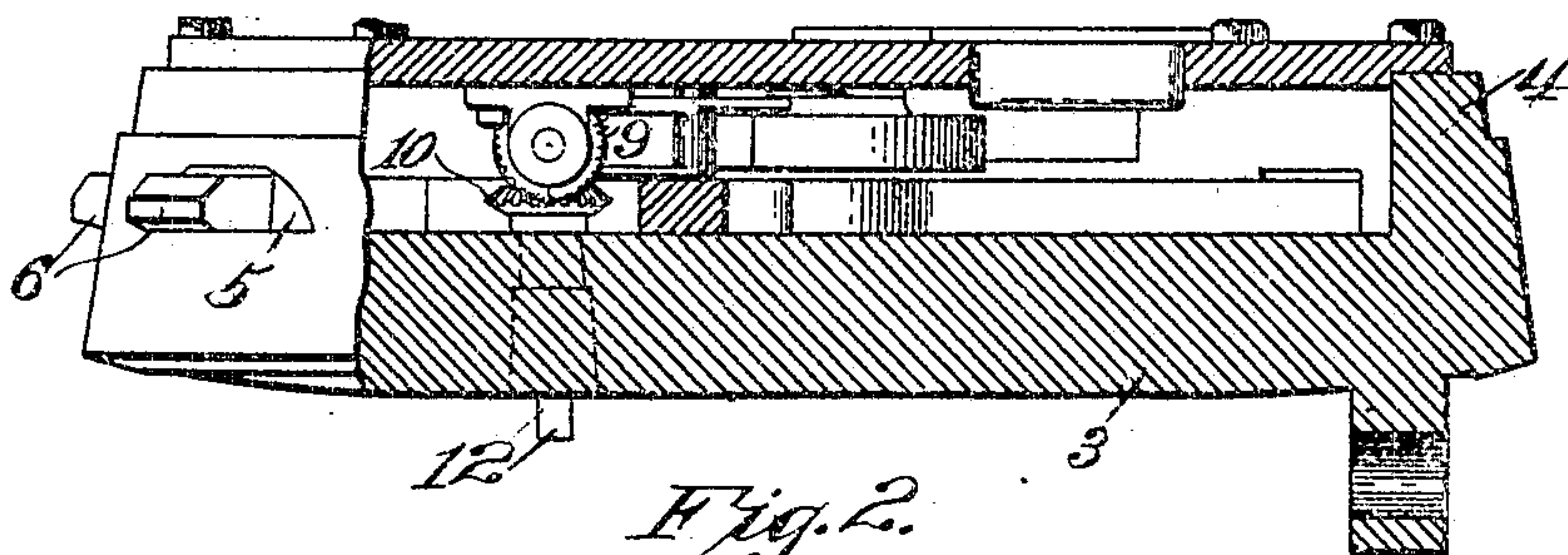


Fig. 2.

Witnesses:

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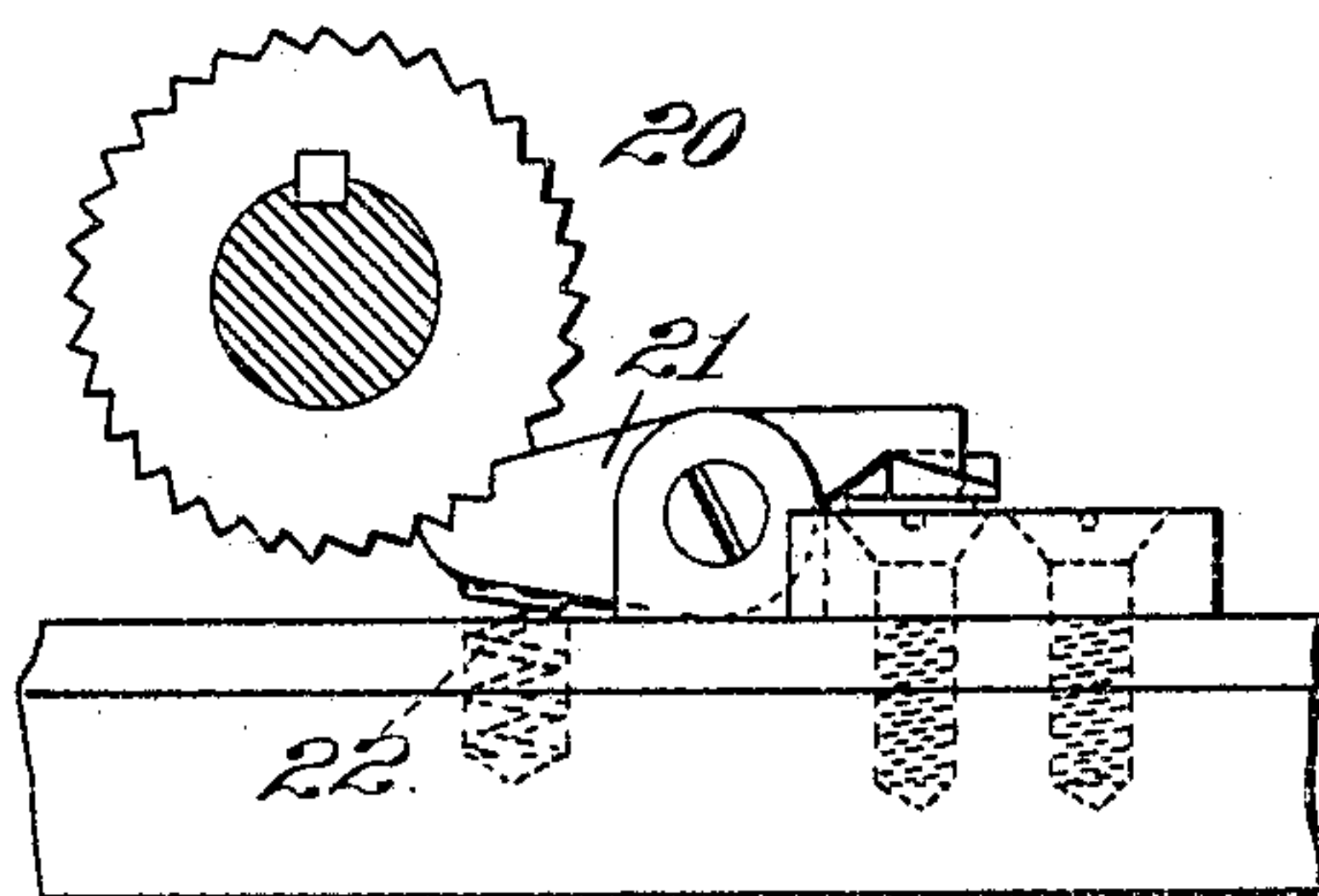


Fig. 4

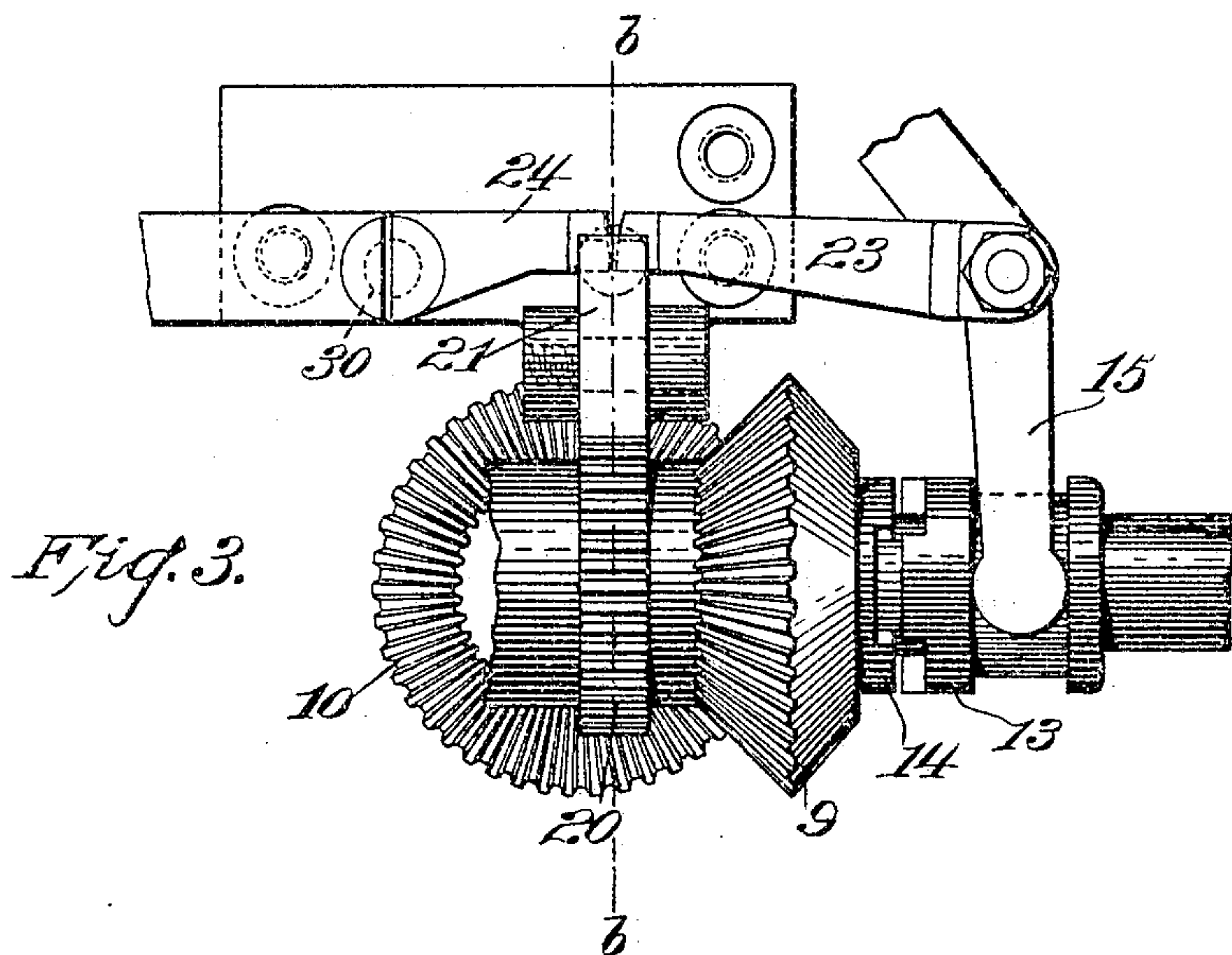


Fig. 3.

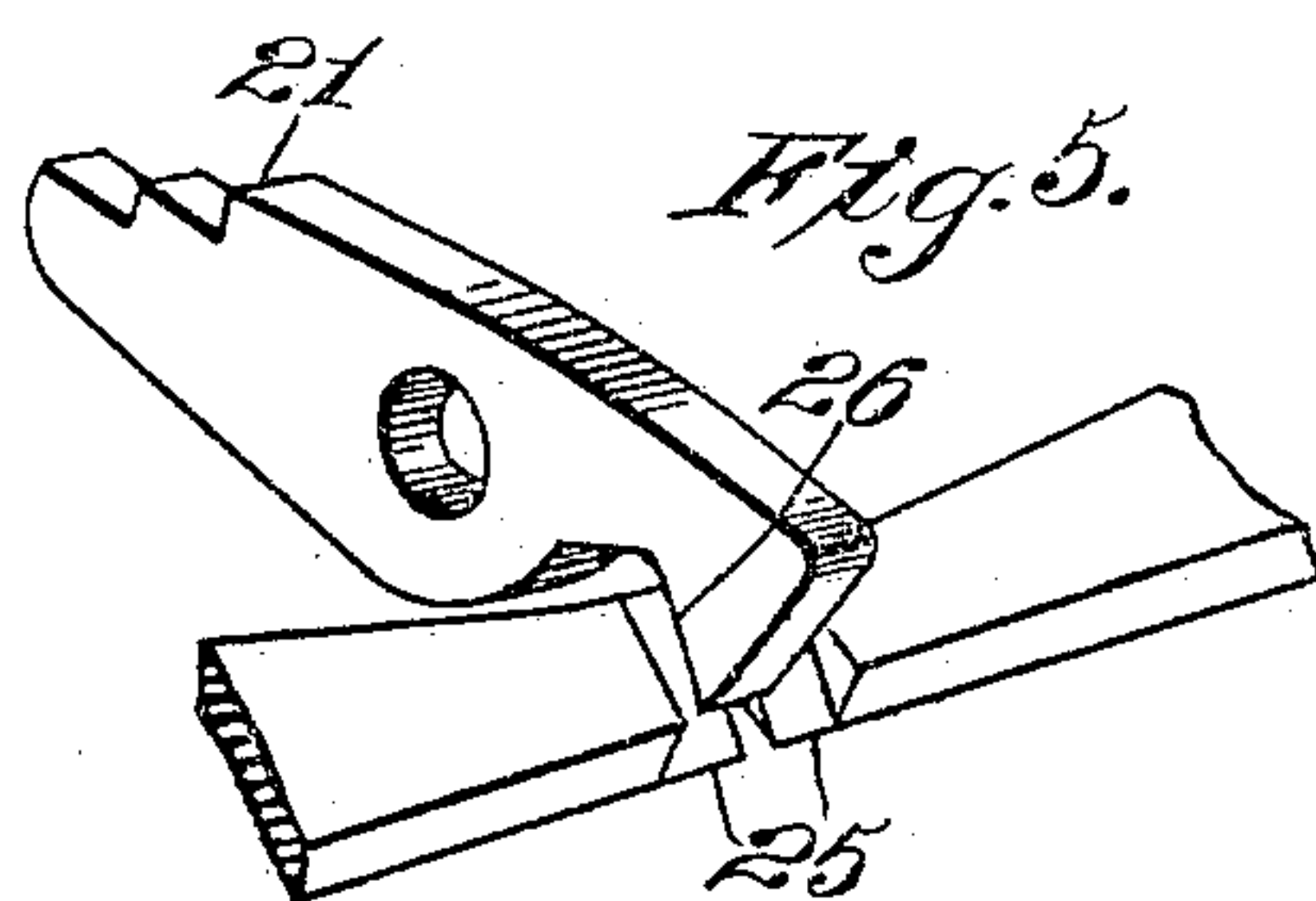


Fig. 5.

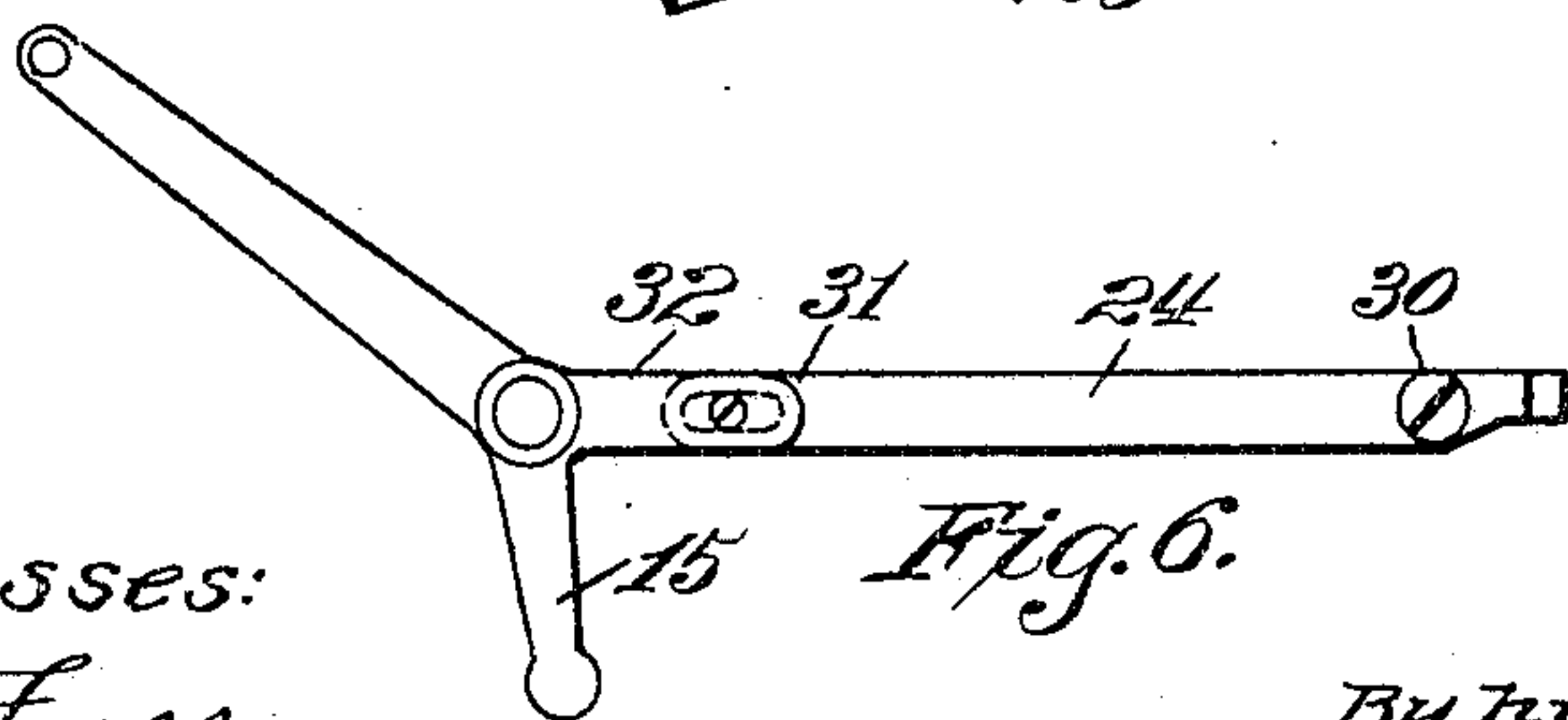


Fig. 6.

Witnesses:

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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.

ACTUATOR-LOCKING MECHANISM FOR SAFES OR VAULTS.

SPECIFICATION forming part of Letters Patent No. 788,106, dated April 25, 1905.

Application filed November 28, 1903. Serial No. 182,952.

To all whom it may concern:

Be it known that I, HENRY D. 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 Actuator-Locking Mechanism for Safes or Vaults, of which the following is a specification.

This invention relates to the bolt mechanism of safes or vaults, the object of the invention being to provide improved means for locking or dogging the bolts.

A further object of the invention is the provision of improved means for locking the bolt-actuator mechanism, thereby to lock or dog the bolts.

The present organization is an improvement in part upon that shown and described in my application, Serial No. 173,237, filed September 15, 1903, and while it may be used in connection with one combination-lock it is herein shown assembled with a pair of such locks. It is to be understood, however, that it can be used either with a single or double spindle safe or vault with equal facility.

In the drawings accompanying and forming part of this specification, Figure 1 is an inside view of a vault or safe door, its bolting mechanism being provided with this improved dogging mechanism, parts of the back being broken away. Fig. 2 is a cross-sectional view thereof, taken in line *a a*, Fig. 1. Fig. 3 is an enlarged detail view of a part of the bolt-actuating mechanism and this improved locking means. Fig. 4 is a cross-sectional view taken in line *b b*, Fig. 3, illustrating the worm-shaft and a part of the locking means. Fig. 5 is a detail view of a part of this locking means, and Fig. 6 is a detail view showing the manner of supporting a part of such locking means.

Similar characters of reference indicate corresponding parts in all the figures of the drawings.

The door 2, which may be of any desired formation, is shown as an integral structure, comprising a body 3 and a flange 4, the flange being provided with bolt-openings 5 for the

passage of the bolts 6, which bolts are pivotally connected at their inner ends to a worm-wheel 7, in mesh with a worm-shaft 8, suitably mounted upon the door, carrying a pair of loosely-mounted bevel-gears 9, in mesh with which is a pair of bevel-gears 10, each mounted on the inner end of a spindle 12, projecting through the door, and by means of which the worm-shaft and the worm-wheel are operated to shift the bolts when the proper combination-lock has been set. A pair of splined clutch members 13 are mounted upon the worm-shaft and cooperate with companion clutch members 14, formed as a part of or on the hubs of the loosely-mounted bevel-gears 9, whereupon when either of the splined clutch members 13 is in engagement with its companion clutch member 14 the worm-shaft may be rotated. The splined clutch members are shifted by a pair of clutch-shifters 15, each connected with a combination-lock 16, whereby on the proper operation of either combination-lock the worm-shaft can be rotated.

To prevent the worm-shaft which constitutes a part of the actuating means from being rotated by vibration when the splined clutch members are disassembled from the loosely-mounted clutch members carried by the bevel-gears, suitable means is provided, which in the present instance comprises a device having locking-faces, which will be designated herein as a "ratchet" or "ratchet pinion or wheel" 20. Suitably mounted in position to engage this ratchet-wheel is a locking member, designated herein as a "locking-pawl" 21, maintained in permanent engagement with such ratchet-wheel by a suitable spring 22. Connected with the clutch-shifters 15 are two levers 23 and 24, one secured to each, the inner ends of which are in position to engage the free end of the pawl 21. In the form shown the inner end 25 of each lever has a cam-face or is beveled and cooperates with an inclined or beveled face 26 of the pawl. When either of the clutch-shifters is moved by its combination-lock to swing the splined clutch member 13 into engage-

ment with the clutch member 14, the pivoted lever 23 or 24 which is connected with that particular clutch-shifter will be shifted or oscillated so that its inclined face 25 will be swung or moved into engagement with the inclined face of the pawl and raise this end of the pawl up, and consequently depress or carry the opposite end of such pawl away from the ratchet, thus unlocking the worm-shaft and permitting said shaft to be rotated on the turning of either spindle in a manner readily understood. To permit both levers to swing in the same direction, one of the levers, as 24, is pivoted at 30, while its free end is pivoted, as at 31, to a lever 32, connected with the clutch-shifter, so that when the lever 32 is moving toward the bevel-gear the pivoted end 31 will be moved in the same direction, and thus throw the inclined face into position to raise the pawl.

From the foregoing it will be seen that on the operation of either clutch-shifter the pawl will be shifted by that lever which is connected therewith against the action of its spring free of the ratchet and that when the clutch-shifter is moved so as to carry the splined clutch member away from its companion clutch member the inclined face of the lever will permit the pawl to be returned to its normal locking position by means of such spring. In the organization shown and described in the application hereinbefore referred to the splined clutch member constituted a part of the locking mechanism, in consequence of which when two combination-locks are used, as illustrated in Figs. 6 and 7, both splined clutch members had to be connected together for the reasons therein stated; but in the present instance this is avoided by mounting the ratchet-wheel directly upon the worm-shaft and rigidly secure it thereto, whereby the operation of either clutch-shifter without the operation of the other will unlock the worm, and thereby the bolts.

Having thus described my invention, I claim—

1. In a safe or vault door, the combination of bolt mechanism, actuating means therefor, and means for locking said actuating means against movement when the bolts are protracted including a pawl-and-ratchet mechanism.

2. In a safe or vault door, the combination of bolting mechanism, actuating means therefor, and means for locking said actuating means against movement when the bolts are protracted and comprising pawl-and-ratchet mechanism, and a lever system for controlling the operation of said pawl.

3. A safe or vault door bolting mechanism comprising bolts, manually-operated actuating means therefor including a rotary member having locking faces or teeth rigid therewith, the organization being such that the locking or dogging of said rotary member

will prevent the retraction of the bolts, and means for engaging one or more of said teeth in whatever position the rotary member may be when the bolts are protracted thereby to lock said rotary member against movement and prevent the retraction of such bolts, and means for unlocking said rotary member.

4. A safe or vault door bolting mechanism comprising bolts, a rotary actuator therefor so connected with the bolts that the locking of such actuator will prevent the retraction of the bolts, and locking means for the actuator comprising locking faces or teeth rigid with said actuator, and a locking member co-operating with said teeth, and means for disengaging said member from said teeth.

5. A safe or vault door bolting mechanism comprising bolts, actuating means therefor, locking means for such actuating means and comprising a member having teeth, and a spring-actuated locking member in engagement therewith, and means for releasing said toothed member.

6. A safe or vault door bolting mechanism comprising bolts, actuating means therefor including a worm-shaft so connected with the bolts that the locking or dogging of said shaft will prevent the retraction of the bolts, one or more locking-faces carried by said worm-shaft against rotation independently thereof, a movable locking member adapted to engage said locking face or faces to prevent movement of said shaft when the bolts are protracted, lock-controlled means for shifting said locking member to permit movement of the shaft and thereby the bolts, a spindle, and means connecting said spindle with the worm-shaft for rotating the latter.

7. In a safe or vault door, the combination of bolting mechanism, actuating means therefor including clutch mechanism, locking means for said actuating means and comprising a pawl-and-ratchet mechanism, a clutch-shifter, and means connected therewith for controlling the operation of said pawl.

8. In a safe or vault door, the combination of bolting mechanism, actuating means therefor, including a shaft, a pair of clutch mechanisms mounted thereon, a pair of clutch-shifters, a ratchet carried by said shaft, a pawl in engagement with said ratchet for preventing movement thereof and of the shaft, and means connected with said clutch-shifters for controlling the operation of said pawl.

9. In a safe or vault door, the combination of bolting mechanism, actuating means therefor including a worm-shaft, a pair of clutch mechanisms mounted thereon, a pair of clutch-shifters, a ratchet-wheel fixedly secured to said worm-shaft, a pawl in engagement with said ratchet-wheel for preventing movement thereof and of the worm-shaft, and means connected with said clutch-shifters for controlling the operation of said pawl, said means comprising a pair of levers.

10. In a safe or vault door, the combination of bolting mechanism, actuating means therefor, including a worm-shaft, a pair of clutch mechanisms mounted thereon, a pair of clutch-shifters, a ratchet-wheel fixedly secured to said worm-shaft, a pawl in engagement with said ratchet-wheel for preventing movement thereof and of the worm-shaft and having an inclined face, and means connected with said clutch-shifters for controlling the operation of said pawl, said means comprising a pair of levers, each having an inclined face cooperating with the inclined face of the pawl.

11. In a safe or vault door, the combination of bolting mechanism, actuating means therefor including a worm-shaft, a pair of clutch mechanisms mounted thereon, a pair of clutch-shifters, a ratchet-wheel fixedly secured to said worm-shaft, a pawl in engagement with said ratchet-wheel for preventing movement thereof, and of the worm-shaft, and means for controlling the operation of said pawl and comprising a pair of swinging members.

12. In a safe or vault door, the combination of bolting mechanism, actuating means therefor, a ratchet-wheel connected with said actuating means, a pawl in engagement with said ratchet-wheel for preventing movement of said bolts, and a swinging device for controlling the movement of said pawl.

13. In a safe or vault door the combination of bolting mechanism, actuating means therefor including a shaft, means for controlling the movement of said shaft, a ratchet carried by said shaft, a pawl in engagement with said ratchet for preventing movement of said shaft at a certain time, and a device for controlling the position of said pawl.

14. In a safe or vault door, the combination of bolting mechanism, actuating means therefor including a shaft, clutch mechanism, a clutch-shifter for controlling the movement of said shaft, a ratchet carried by said shaft, a pawl in engagement with said ratchet for preventing movement of said shaft at a certain time, and a device connected with said clutch-shifter for controlling the position of said pawl.

15. In a safe or vault door, the combination of bolting mechanism, actuating means therefor including a worm-shaft, clutch mechanism, a clutch-shifter for controlling the movement of said shaft, a ratchet carried by said shaft, a pawl in engagement with said ratchet for preventing movement of said shaft at a certain time, and a swinging device connected with said clutch-shifter for controlling the position of said pawl.

16. In a safe or vault door, the combination of bolting mechanism, actuating means therefor including a worm-shaft, clutch mechanism for controlling the movement of said worm-shaft, a clutch-shifter, a ratchet carried by said shaft, a pawl in engagement with said ratchet for locking said shaft when idle and

having an inclined surface, and a swinging device connected with said clutch-shifter for controlling the movement of said pawl, said swinging device comprising a lever having an inclined surface cooperating with the inclined surface of the pawl.

17. In a safe or vault door, the combination of bolting mechanism, actuating means therefor, locking means for said actuating means and comprising a device rigidly secured to a part thereof against movement independently thereof, and provided with a locking face or faces, a locking member cooperating therewith, means for controlling the position of said locking member, a combination-lock, and means connecting said controlling means with the combination-lock for movement thereby.

18. In a safe or vault door, the combination of bolting mechanism, actuating means therefor, and pawl-and-ratchet mechanism for locking said bolting mechanism against movement at a predetermined time.

19. In a safe or vault door, the combination of bolting mechanism, actuating means therefor, and pawl-and-ratchet mechanism effective to prevent movement of the bolts during a predetermined period, said ratchet mechanism having a part thereof rigidly secured to a part of the actuating means and held against movement independently thereof.

20. In a safe or vault door, the combination of bolting mechanism, actuating means therefor, a pawl and ratchet effective to prevent movement of the bolts during a predetermined period, a combination-lock, and means controlled thereby for controlling the operation of said ratchet mechanism.

21. In a safe or vault door, the combination of bolting mechanism, actuating means therefor, a pawl-and-ratchet mechanism effective to prevent movement of the bolts during a predetermined period, clutch mechanism, and means controlled thereby for controlling the operation of said ratchet mechanism.

22. In a safe or vault door, the combination of bolting mechanism, actuating means therefor, a pawl-and-ratchet mechanism effective to prevent movement of the bolts during a predetermined period, clutch mechanism, means controlled thereby for controlling the operation of said ratchet mechanism, and a combination-lock for controlling the operation of said clutch mechanism.

23. In a safe or vault, the combination of bolting mechanism, a worm-shaft, a pair of locking-faces one rigid with said shaft for movement only therewith, and the other cooperating therewith to prevent movement of said shaft, means for releasing said shaft, a spindle, and means controlled thereby for actuating said shaft.

24. In a safe or vault, the combination of bolting mechanism, actuating means therefor including clutch mechanism, a pair of locking-faces one rigid with a part of said actuating

means for movement only therewith, and the other cooperating therewith to prevent movement thereof, and means connected with said clutch mechanism for disengaging said cooperating locking-faces to permit movement of said rigid locking-face, and a combination-lock controlling said clutch mechanism.

25. In a safe or vault door, the combination of bolts, a worm-shaft, a pair of locking-faces one secured to said shaft against independent rotary movement, and the other carried by a pivoted member and cooperating therewith to prevent movement thereof and thereby said shaft, and means for disengaging said cooperating locking-faces to permit movement of said worm-shaft.

26. In a safe or vault, the combination of bolting mechanism, a pair of locking-faces one rigid with a rotary part of such mechanism for movement only therewith, and the other cooperating therewith to prevent movement thereof, a spindle, means connecting it with said rotary part to permit the shifting of the bolts, and lock-controlled means for disengaging said cooperating locking-faces to permit rotary movement of said rigid locking-face.

27. A safe or vault door bolting mechanism comprising bolts, manually-operated actuating means having a part connected with said bolts and having an actuator interlocked with said part in such manner that the dogging or locking of the actuator will prevent the retraction of the bolts, means for locking said actuator against movement and comprising a member having a locking-face, and a spring-actuated locking device adapted to engage said face, and means for shifting said locking device.

28. In a safe or vault door, the combination of bolting mechanism, ratchet means effective to lock such bolting mechanism against movement at a predetermined time, and oscillatory means for controlling the operation of said ratchet-locking means.

29. In a safe or vault door, the combination of bolting mechanism, actuating means therefor, means for locking such actuating means against movement at a predetermined time, and oscillatory means for controlling the operation of said locking means.

30. In a safe or vault door, the combination of bolting mechanism, actuating means therefor, ratchet means for locking such actuating means against movement at a predetermined time, and oscillatory means for controlling the operation of said ratchet-locking means.

31. A safe or vault door bolting mechanism comprising bolts, actuating means therefor having a part connected with said bolts and having an actuator interlocked with said part in such manner that the dogging or locking of one of said parts will prevent the retraction of the bolts, means comprising a pair of cooperating devices one having a circular series

of teeth for locking one of said parts and thereby the bolts against retraction and rigid with said part and means for disengaging said locking devices to permit movement of the bolts.

32. A safe or vault door bolting mechanism comprising bolts, a rotary shaft so connected with such bolts that the locking or dogging of said shaft will prevent retraction of the bolts, means for locking or dogging the shaft and comprising a pair of cooperating locking members, one having teeth, and one carried by said shaft against movement independently thereof, and means for disengaging said locking members to permit movement of said shaft and bolts.

33. A safe or vault door bolting mechanism comprising bolts, a worm for shifting said bolts, locking or dogging means for said worm and comprising one or more locking faces or teeth carried by or rigid with said worm and a locking-pawl in engagement therewith and means for shifting said pawl to permit the retraction of the bolts.

34. In a safe or vault door, the combination of bolt mechanism, actuating means therefor, ratchet-locking means effective to prevent movement of the bolts during a predetermined period, a combination-lock, and oscillatory means controlled thereby for controlling the operation of said ratchet-locking means.

35. In a safe or vault door, the combination of bolt mechanism, actuating means therefor, locking mechanism effective to prevent movement of the bolts when the actuating means is idle, clutch mechanism independent of said locking mechanism, and means controlled by said clutch mechanism for controlling the operation of the locking mechanism.

36. A safe or vault door bolting mechanism, comprising bolts, actuating means including worm-gearing for shifting said bolts, means for rendering said worm-gearing ineffective to shift the bolts, said means comprising a toothed member, and a locking-pawl for preventing movement of said worm-gearing when idle, thereby to prevent retraction of the bolts by vibration, and means effective to shift said locking-pawl.

37. A safe or vault door bolting mechanism comprising bolts, actuating means including worm-gearing for shifting said bolts, means for rendering said worm-gear ineffective to shift the bolts, said means comprising a toothed member, and a locking-pawl for preventing movement of said worm-gearing when idle, thereby to prevent retraction of the bolts by vibration, and means including a swinging or oscillatory member effective to shift said locking-pawl.

38. A safe or vault door bolting mechanism comprising bolts, and actuating means therefor including a spindle, lock-controlled means for connecting up or disconnecting said spin-

dle with another part of said actuating means
thereby to respectively permit or prevent the
shifting of the bolts through said spindle, and
means also controlled by said lock for dogging
5 a part of said bolt mechanism to prevent the
premature retraction of the bolts after the dis-
connection of the parts by said lock, and com-
prising a pair of members one carried by a

pivoted member and one movable toward and
from the other.

Signed at Nos. 9 to 15 Murray street, New
York, N. Y., this 26th day of November, 1903.

HENRY D. HIBBARD.

Witnesses:

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JOHN O. SEIFERT.

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