

W. CORLISS.
Burglar-Proof Safes.

No. 146,382.

Patented Jan. 13, 1874.

Fig. 1.

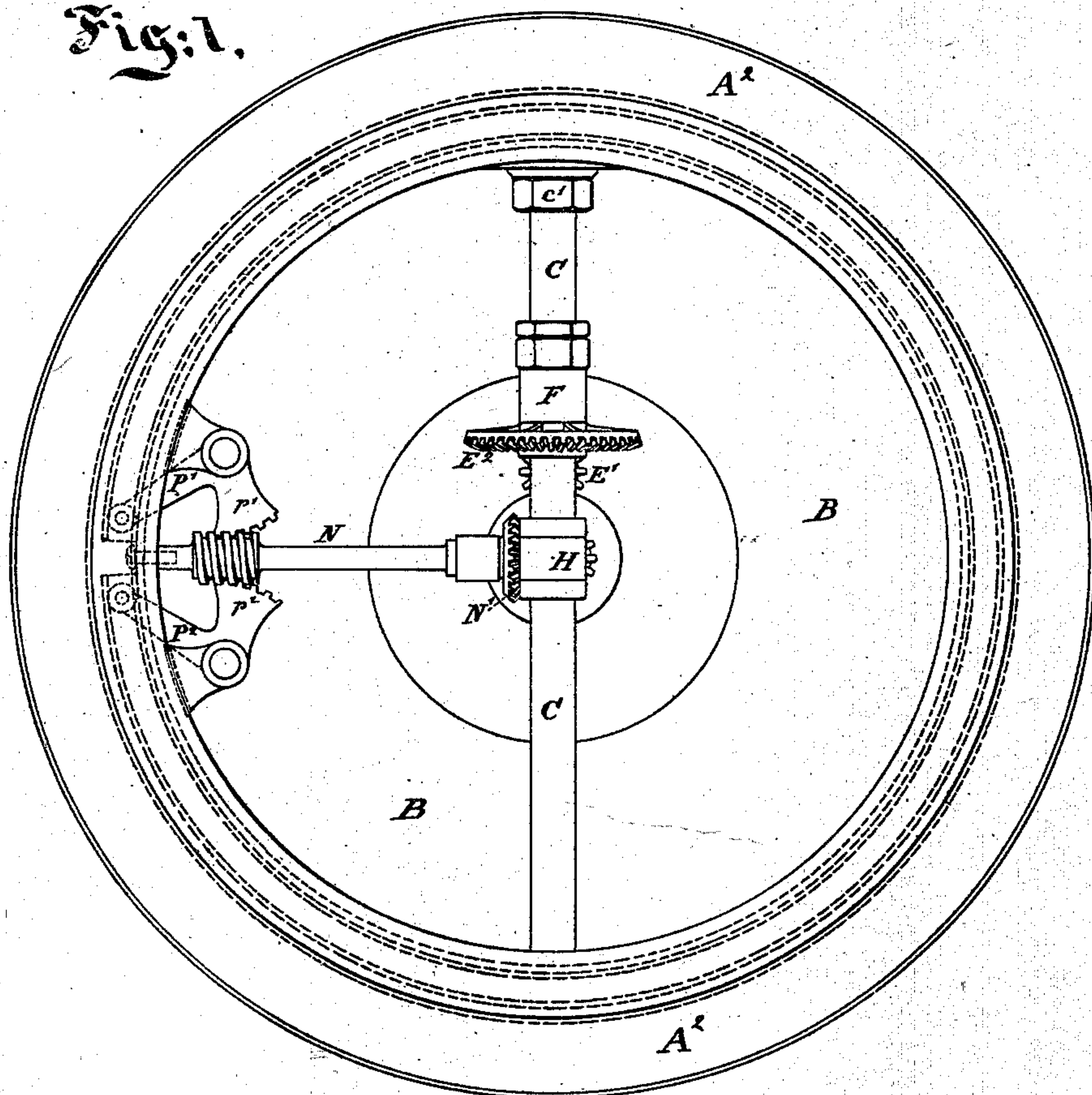
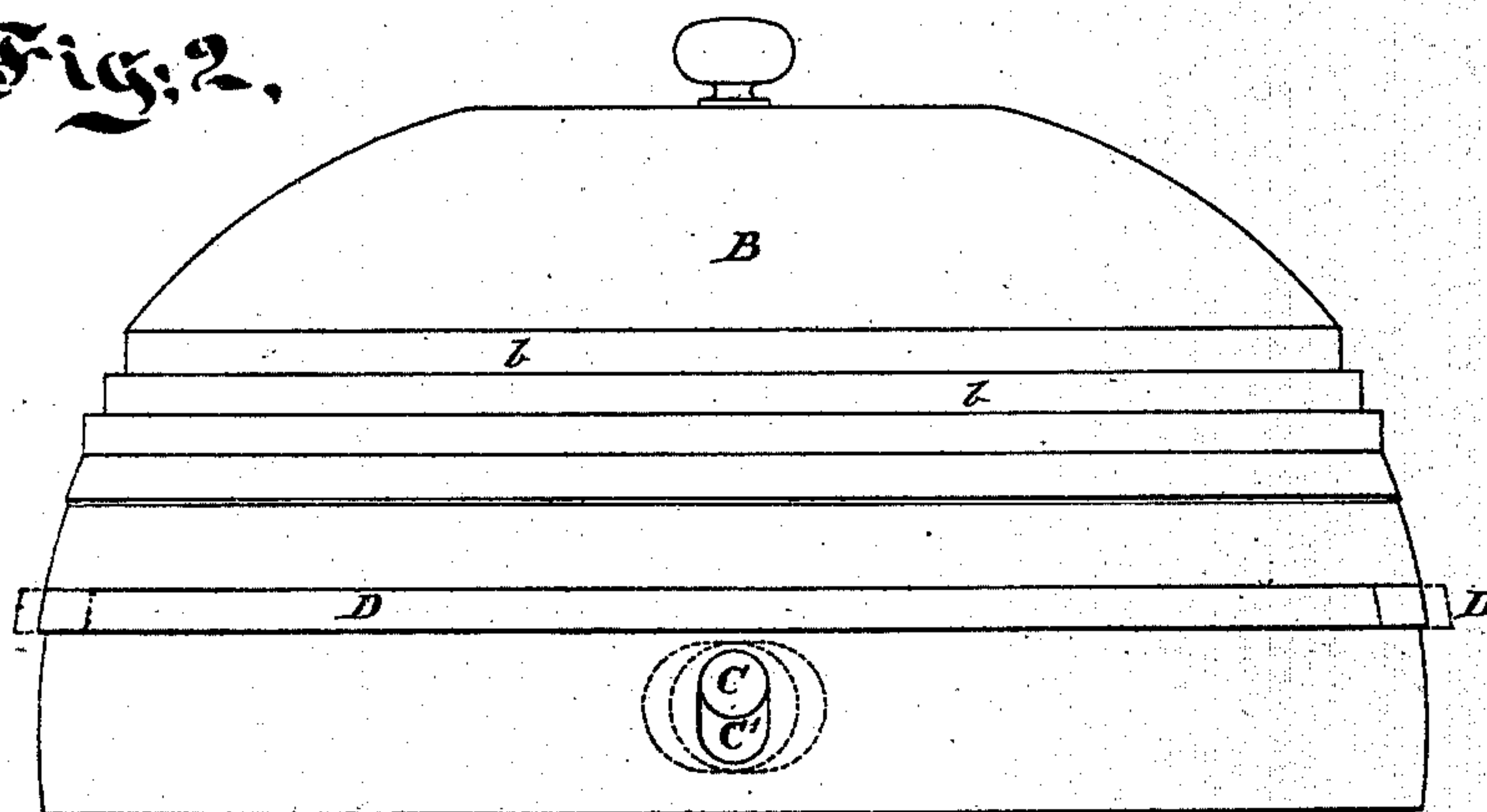


Fig. 2.



Witnesses;

Arnold Hornum.

Alg. Westbrook.

Inventor;

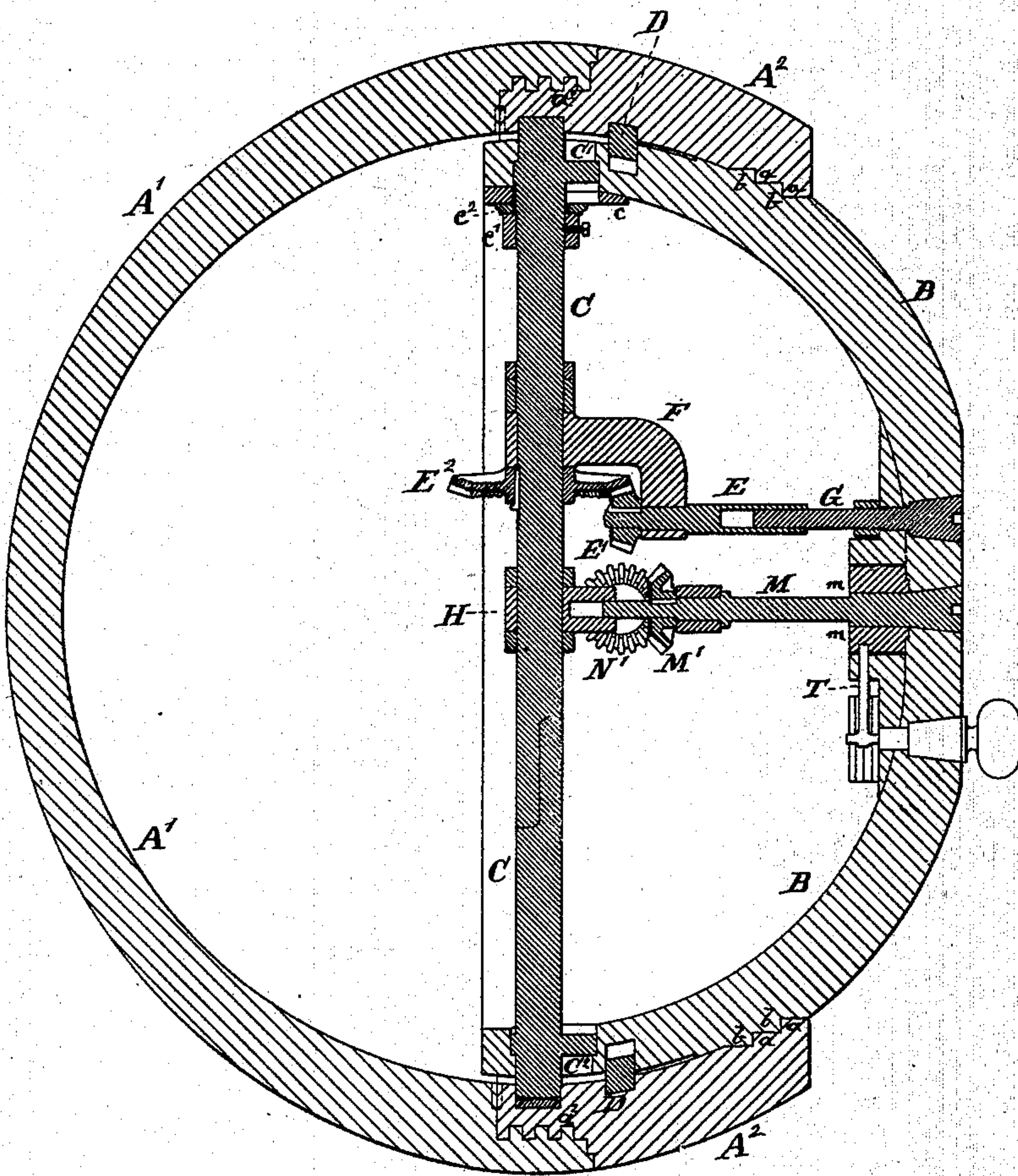
William Corliss
by his atty T. D. Stearns

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Fig. 3.



Witnesses;

Arnold Hermann.
Alfred Westbrook

Inventor;

William Corliss
by his attorney T. S. Stead

UNITED STATES PATENT OFFICE.

WILLIAM CORLISS, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN BURGLAR-PROOF SAFES.

Specification forming part of Letters Patent No. **146,382**, dated January 13, 1874; application filed May 24, 1873.

To all whom it may concern:

Be it known that I, WILLIAM CORLISS, of Providence, in the State of Rhode Island, have invented certain Improvements relating to Burglar-Proof Safes, of which the following is a specification:

The invention relates to means for securing the door with extraordinary force, and to means for moving the door forward and backward without lateral disturbance.

I will proceed to describe what I consider the best means of carrying out the invention.

The safe is in the spheroidal form, the large opening on one side being closed by a corresponding door, which opens by being drawn inward and then swung around. The interior of the main body around the door is recessed in steps or offsets, and the surfaces of the door which match thereto are correspondingly formed. Provision is made for imparting the required reciprocating motion, and for holding the door firmly against these steps. The movement is obtained by means of eccentrics on a shaft which is adapted to be turned independently of the door. The locking is made peculiarly effective by the use of what I term an expanding ring, which serves as a peculiarly-efficient bolt, and is a stout hoop or band, extending nearly around the door, controlled by suitable locking means connected at its ends, so that, on the ends being drawn together thereby, the bolt will contract into a recess in the door, and be of no effect; but on allowing the ends to separate the bolt will enlarge or expand out of the groove or recess, and enter partially into a corresponding recess or groove in the main body or shell of the safe, in which latter position it serves as a locking-bolt, which is efficient not at a few points only, but engages the door with the main body over nearly or quite its whole circumference. Gears are employed, peculiarly arranged, to operate the eccentrics and the locking-ring.

The accompanying drawings form a part of this specification.

Figure 1 is a front view of the safe with the door open. Fig. 2 is a top view of the door detached, and Fig. 3 is a central vertical section in a plane at right angles to the above, with the door closed and locked.

Similar letters of reference indicate like parts in all the figures.

A¹ is a part of the main body. A² is another part, which completes the main body, and is joined to A¹ by strong screw-threads a². One or more keys, shown in dotted lines, inserted into the joint from the interior, prevents any possible unscrewing of these parts after they are put together, until these keys are removed. B is the door, formed in one piece. The steps b on the door are adapted to match tightly against corresponding steps a on the interior of the main body. C is an upright shaft, inserted in two separate pieces, and strongly spliced together, as indicated. This shaft serves as a pivot on which the door B is swung around to open the safe. C¹ C² are eccentrics formed on the shaft C, and adapted to move the door forward when the shaft is turned in the proper direction. The formation of the door adjacent to the upper eccentric, to allow the several motions, is shown in Fig. 2. The parts adjacent to the lower eccentric are similarly formed. The door moves backward and forward without wobbling or any lateral motion. D is my expanding ring or circular bolt. It may be formed of steel or other suitable material, and is, preferably, constructed and applied with a tendency to expand. It is sufficiently elastic to allow the ends to be drawn together, and its diameter to be thereby diminished, so as to lie entirely within the groove provided in the door. There is a corresponding groove in the adjacent part of the interior of the main body, and when the ends of the bolt D are separated the expanding ring or bolt D enlarges its diameter, and, partially entering the groove in the main body, secures the door very firmly.

One or more locks, which may be of the combination style, or of any other suitable character, may be employed, with suitable means for operating. I do not deem it necessary to draw or describe the details of the lock or locks. It will be sufficient to indicate their relations to the other parts of the mechanism.

On the shaft C is keyed a beveled gear-wheel, E², which receives motion from a smaller beveled gear-wheel, E¹, fixed on the end of a

shaft or sleeve, E. The latter is supported in a bracket, F, which is mounted loosely on the shaft C, so that the shaft may be free to turn within it. The sleeve E receives motion from a shaft, G, extending to the outside of the front of the door, and properly protected against being forced by any violence. To turn the shaft C, a proper wrench or crank is applied to the end of the shaft G. Entirely independent of the shaft G is a shaft, M, also suitably defended against violence, which operates my expanding bolt. The inner end of the shaft M is adapted to slide in a long socket in a piece, H, which is mounted on the shaft C with liberty for the latter to turn within it. The beveled gear-wheel M' fixed on the shaft M acts on the gear-wheel N', and thus gives motion to the shaft N, which, by a stout screw-thread or worm, acts on the correspondingly-formed threads or teeth on the sector-arms $p^1 p^2$ of the levers $P^1 P^2$, which latter take hold, respectively, of the two ends of the circular bolt D. On applying a suitable wrench or crank to turn the shaft M, the levers $P^1 P^2$ are drawn together and the circular bolt D is retracted into the groove in the door. By turning the shaft M in the opposite direction, the levers $P^1 P^2$ are allowed to separate, or may be separated with great force, if desired, thereby causing the circular bolt D to move outward into the recess in the main body. A lock or series of locks (not represented) control the position of one or more locking-bolts, T, which may be of any suitable form and material, and, according to their position, confine or liberate the wheel m , which is fixed on the shaft M. The bolt T, being thrust into the piece m , confines the shaft M and its connections until T is withdrawn. There may be one or more locks controlling also the action of the shaft G.

Supposing the safe to be properly secured, the operation of opening it is as follows: First, the lock bolt or bolts T are withdrawn from the piece m by properly operating the lock or locks. (Not fully represented.) Then a proper stout key or wrench being applied to the shaft M it is turned, and the levers $P^1 P^2$ are thereby drawn together until the expanding ring or circular bolt D is entirely within its groove in the door, and no longer takes any hold in its groove in the main body of the safe. Next, the shaft G is operated, and thereby the upright shaft C and the eccentrics $C^1 C^2$ are slowly turned half a revolution, drawing the door B inward. By this movement the steps b are disengaged from

their hold on the steps a and the door B is free to be opened by being swung around within the main body. The weight of the door rests on the shaft C by means of the plate c , and the adjacent nut and washer $c^1 c^2$, as will be obvious. To close the safe the above operation is reversed.

I esteem the steps b a important elements of the construction, as they not only serve to prevent wedging open the safe, and make a firm and proper bearing for the door as it is forced outward, but also adjust or seat the door in its true closed position, so that the expanding ring D on moving outward is certain to enter the groove in the main body and firmly confine the parts.

I propose to make the parts $A^1 A^2$ and also the door B of alternate laminae of soft iron and steel applied together in a heated state, and firmly united to form a unit. The material is then forged to shape and hardened. They may be formed thus commingled by casting the flush steel upon heated masses of the iron. The several parts A^1, A^2 , and B are thus each a single solid piece, and, being secured together internally, serve to constitute a much more substantial safe than when formed of united laminae or the like separate pieces, while they possess the combined toughness and undrillable character due to their compound nature. The screw-threads a^2 are more easily formed if the metal is so arranged that they come in the soft iron; but if partly or altogether in the steel, or franklinite, or other hard material, they may be shaped before hardening, and afterward sufficiently perfected by grinding with proper machinery.

I claim as my invention—

1. In a safe with a circular door, B, the expanding ring D, with suitable operating means adapted to engage and liberate the door and main body, substantially as herein specified.

2. In combination with a spheroidal door and spheroidal body matching by steps $a b$, the eccentrics $C^1 C^2$ mounted, as shown, upon the shaft upon which the door turns, so as to move the door forward and backward without lateral movement, as herein specified.

In testimony whereof I have hereunto set my hand this 9th day of May, 1873, in the presence of two subscribing witnesses.

WILLIAM CORLISS.

Witnesses:

THOMAS D. STETSON,
ARNOLD HÖRMANN.