

Devices for Operating Safe-Doors.

Patented Nov. 25, 1873.

Technical drawing of a mechanical assembly in cross-section. The assembly consists of a central shaft (B) passing through a housing (A). The shaft has a central hole (D) and is secured with a nut (E) and a washer (Z). A flange (C) is attached to the end of the shaft. The housing (A) has a central bore (D) and a flange (C) at the end. The drawing is labeled with letters A, B, C, D, E, Z, and C².

A detailed technical drawing of a mechanical assembly, likely a clockwork or automaton component. It features a central vertical shaft with two gears of different sizes. The top gear is labeled 'S' and the bottom gear is labeled 't'. The shaft is supported by a frame with two horizontal bars, each labeled 'F'. The entire assembly is enclosed in a rectangular frame with a double border. Various points and components are labeled with letters: 'A' at the bottom center, 'B' at the top center, 'C' and 'D' on the left side, 'E' and 'F' on the right side, 'G' and 'H' on the far left, 'I' and 'J' on the far right, 'K' and 'L' on the top, 'M' and 'N' on the bottom, 'O' and 'P' on the left side of the frame, 'Q' and 'R' on the right side of the frame, and 'S' and 't' on the gears.

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IMPROVEMENT IN DEVICES FOR OPERATING SAFE-DOORS.

Specification forming part of Letters Patent No. **145,032**, dated November 25, 1873; application filed July 10, 1873.

To all whom it may concern:

Be it known that I, HIRAM B. TRIPP, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Safes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing forming part of this specification.

The present invention relates to the hanging of safe-doors, more especially such doors as are constructed with a right-angular tongue-and-groove joint between the door and its jamb; and the purpose of the invention is to secure a movement of the door out from its jamb in a straight line, or nearly so, sufficient that when the door is swung it will perfectly clear the edges, grooves, and tongues of the jamb.

The invention consists, first, in combination with said doors, of a hinge constructed of two leaves pivoted together, with the one fastened to the door, and the other pivoted to a bracket or third leaf fixed to the outside of the safe-body or frame in which the door swings, and of a rod arranged to turn in suitable bearings of the door, entering the free leaf of hinge on door, and constructed together with said free leaf, as, when it (the rod) is turned in the one direction, to draw the door at such portion out of its jamb, and when turned in the other direction, to move it into its jamb, the door when moved out, as stated, if opened, swinging through the free leaf of hinge on the bracket-leaf referred to as on safe-body or door-frame; second, in combination with a hanging of the door, substantially as above described, or any equivalent therefor, of a spindle arranged to turn within the safe-door, when said spindle is connected to the operating-rod, or equivalent thereof, in said hinging, in such manner as, by turning said spindle, the said operating-rod will be actuated in either direction to produce the desired and proper moving out and in of the door with regard to its jamb; third, in combination with a hanging of the door, substantially as described, of a spindle for throwing the bolts of the door, when said spindle is connected to the operating-rod, or equivalent thereof, in said hinge, in such manner that, by the turning of said spindle, the bolts will be thrown and the

said operating-rod actuated, the first occurring before the door is swung out of its jamb, if the safe is to be opened, and after the door is swung into its jamb if the safe is to be closed.

In the accompanying plate of drawings my improvements in safes are illustrated, Figure 1 being an exterior elevation of a safe, showing its door as hung according to the several features thereof; Fig. 2, a horizontal section in plane of line *x x*, Fig. 1; Fig. 3, a transverse vertical section in plane of line *y y*, Fig. 1; Fig. 4, a view of the inner face of door, but on a reduced scale.

A in the drawings represents the body of a safe, to which B is the door, and C the jamb of the door, both constructed around their contiguous edges, if closed, with right-angular tongues and grooves, as shown in Figs. 2 and 3; C², two hinges by which door B is hung in safe-body A. The hinges C² are similarly constructed, and are each formed of three parts in leaves *a*, *b*, and *c*. The parts or leaves *a* and *b* are pivoted end to end at *d*, and the other end of part *b* pivoted to the part *c*. The leaf *a* is firmly secured by screws *f*, or otherwise, to the door, leaving the leaf *b* free thereof, and the leaf *c* is fixed to the safe-body A, or frame in which the door is hung. The hinge-point of the leaf *b* and leaf *c* is such that, when the door is within its jamb, the leaf *b* will be at an acute angle horizontally from end to end in the face of the door. The hinges C², constructed as above described, are arranged in horizontal positions upon the door, one above and parallel with the other, the door being adapted to swing horizontally open. D is a rod, arranged vertically upon the door B, and adapted to turn in fixed bearing-blocks E thereon. This rod D, at each end, enters an elongated recess, *h*, of the free leaf *b* to hinges C², and at such portions of its length either more or less within the leaf *b* aforesaid it is constructed with cam or eccentric *l*. The rod D is the operating-rod, so called, for the hanging, above described, of the door, and, by turning it around within its bearings E, either more or less, it is obvious, with a proper amount of eccentric or cam periphery *l*, the door to which the hinges C² are applied will be moved out of or into its jamb, as the case may be, and in a straight line,

or nearly so. With a sufficient length of movement to the door, from the operation of the rod D above described, it is manifest the door can be brought out of its jamb sufficient for the tongues and grooves of its edge to clear those of the jamb, when the door may be swung open. The door, in swinging open, turns by the leaves *b* on the pintle attached to leaves or brackets *c*. *m*, a pinion-wheel secured to operating-rod D, in the present instance near the lower hinge of door to safe-body; *n*, a rack-bar arranged to interlock with pinion-wheel *m*, and slide in a groove formed in the safe-body A and door B. This rack-bar *n* is continued along the front face of the safe-door B, resting upon a guide-bracket, *p*, fixed to safe-door, where, by its rack *q*, it is arranged to engage with a sector-tooth wheel, *r*, fastened to or forming a part of a spindle, *E*², arranged to turn within the door B, said spindle *E*² having handle *F*, for convenience in turning it.

With a connection of parts between spindle *E*² and operating-rod D, substantially as above described, it is obvious turning said spindle actuates the rod D, which, consequently, through its movement within the leaves *b* of hinges *C*², moves the door out of or into its jamb, as the case may be, and in the manner before described.

The spindle *E*², in the present instance, is the spindle for throwing the bolts *F*² to safe-door B, said bolts *F*² being arranged substantially in the same manner as ordinarily—that is, to move horizontally across the inner face of door through vertical guide-bars *G* fixed thereto, and to interlock within the door-jamb. For the spindle *E*² to throw the bolts *F*², its end upon the inner side of safe-door is provided with a sector gear-wheel, *s*, to engage with a horizontal toothed rack-bar, *t*, fixed to the rail *O*, tying together the two bolts *F*² of the safe-door.

With the gear-wheel *s* of spindle *E*² in connection with the rack-bar *t* of tie-rail *O* for bolts *F*², it is obvious the bolts can be thrown either in or out by simply turning the spindle around in the one or the other direction, as may be required.

With sector gear-wheels *r* and *s* on spindle *E*², and their proper relative adjustment on spindle, it is plainly obvious that the movement of the bolts *F*² in the unbolting of the safe may be made to fully take place before the movement of the door out of its jamb commences, and vice versa—that is, the one operation following the completion of the other—

it being obvious that if the spindle *E*² is employed to perform both operations, above described, sector gear-wheels or equivalents therefor must be used, and they must be relatively arranged therefor on the spindle, such arrangement being shown in the drawings.

In lieu of toothed gearing being employed for a connection between spindle *E*² and operating-rod D, and also between spindle and door-bolts, frictional gearing or other suitable mechanical means—such as, for instance, crank-arms and pitman-rods—may be used; but an arrangement of parts, as a whole, substantially as above described, is most desirable and efficient.

L, a stop secured to safe-door in position to limit and arrest the movement of the extension rack-bar, and on the door in its line or direction of movement, to move the door out of its jamb.

The actuating of door-hanging by the turning of a spindle, *E*², may be applied to other forms of hanging than that herein particularly described, and therefore it is not intended to limit such feature of this invention to any particular door-hanging so long as it is susceptible of adaptation for operation by the spindle.

Having thus described my improvements in safes, what I claim, and desire to secure by Letters Patent, is—

1. A safe-door hinge, *C*², consisting of the leaves *a b c*, connected together and applied to said door and safe-body as herein described, in combination with the rod D, having cams or eccentrics *l l* and a spindle arranged to turn within the door and connected with rod D, as herein described, for the purpose set forth.

2. The combination, with a door hung substantially as herein described, of a spindle arranged to turn within the door, when such spindle is connected to the rod or other part for operating said door-hanging, substantially as and for the purpose described.

3. The combination, with a door hung substantially as herein described, of a spindle arranged to turn within the door, when such spindle is adapted to both actuate the rod D or its equivalent, for operating said door-hanging, and to throw the bolts on the door, substantially as described.

The above specification of my improvements in safes signed by me this 14th day of June, 1871.

Witnesses:

H. B. TRIPP.

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