

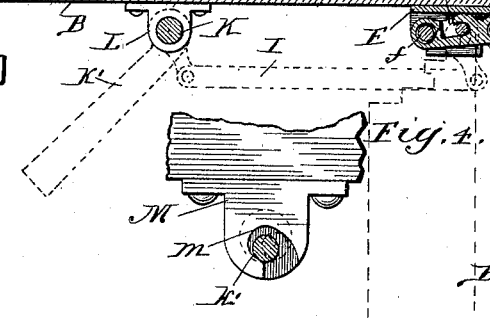
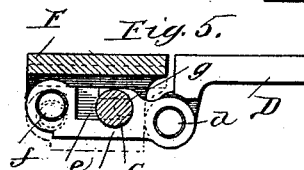
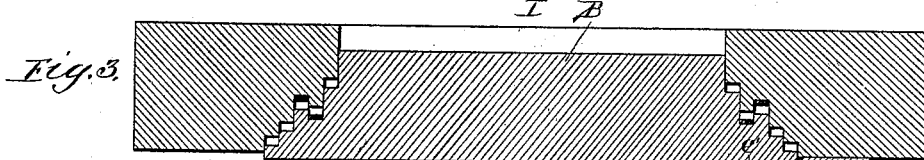
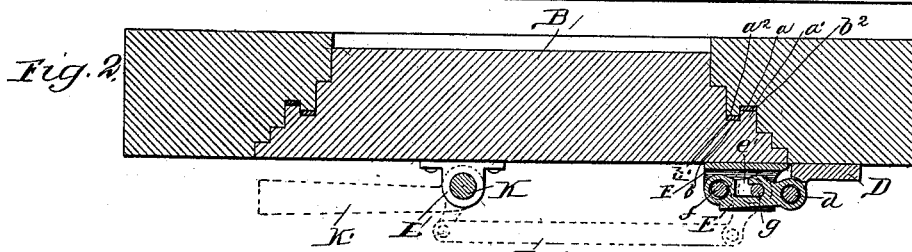
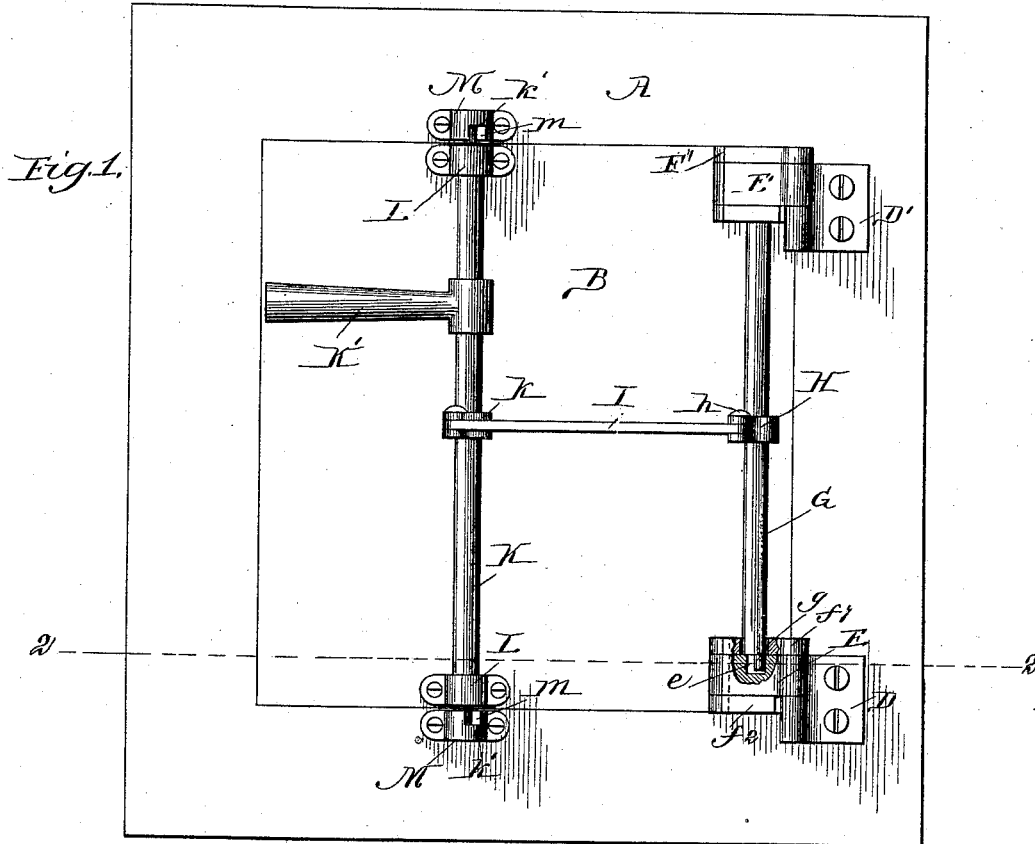
(No Model.)

E. J. GROSS.

HINGE MECHANISM FOR DOORS OF SAFES OR VAULTS.

No. 423,149.

Patented Mar. 11, 1890.



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UNITED STATES PATENT OFFICE.

EDGAR J. GROSS, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE CHICAGO SAFE AND LOCK COMPANY, OF SAME PLACE.

HINGE MECHANISM FOR DOORS OF SAFES OR VAULTS.

SPECIFICATION forming part of Letters Patent No. 423,149, dated March 11, 1890.

Application filed October 13, 1888. Serial No. 238,033. (No model.)

To all whom it may concern:

Be it known that I, EDGAR J. GROSS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful improvements in Hinge Mechanism for the Doors of Safes or Vaults, of which I do declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My present invention has relation to that class of hinge mechanism designed for use upon safes or vaults, the door frames or jambs and doors of which are "stepped" or inclined, and provided with grooves and ribs adapted to interlock when the door is in closed position. As it is customary to form the ribs and grooves that extend from the stepped edges of the door and its jamb at right angles to the plane of the door, it is very desirable that the hinge mechanism employed should be of such character as to impart to the door in the act of opening it an initial straight outward movement, in order that the ribs and grooves may be disengaged before the swinging movement of the door begins. Various forms of hinges have been heretofore devised to accomplish this straight-line movement of the door, an example of this type of hinge mechanism being illustrated in Letters Patent No. 370,472, granted to the Chicago Safe and Lock Company as assignee of H. Gross, September 27, 1887.

The primary object of my present invention is to provide an improved hinge mechanism that shall be very simple and cheap in construction, and shall enable the door to be firmly and securely hung, while at the same time permitting it to be readily opened and closed with the desired straight-line movement at the proper times for causing the ribs and grooves of the door and jamb to engage and disengage each other.

To this end my invention consists in the novel features of construction, hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the claims at the end of this specification.

Figure 1 is a face view of the door-jamb

and door embodying my improvements, parts being broken away for the purpose of better illustration. Fig. 2 is a view in transverse section on line 2 2 of Fig. 1. Fig. 3 is a view similar to Fig. 2, but showing the parts in the position assumed at the end of the initial outward movement of the door. Fig. 4 is an enlarged detail view in central vertical section. Fig. 5 is an enlarged detail view of the hinge mechanism, the shifting-rod and the door-section of the hinge being shown in cross-section and the remaining parts being shown in plan.

A designates the body of the safe or vault wall adjacent the door, and B denotes the door. The door-jamb of the safe or vault is of the well-known "stepped" or "inclined" form, and is provided with a channel *a*, adapted to receive a felt packing *a'*, and with an outwardly-projecting rib *a²* extending entirely around the jamb of the door. The corresponding inclined or stepped edge of the door B is in like manner provided with one or more channels *b*, adapted to receive a felt packing *b'* and to admit the rib *a²* of the door-jamb, and with a rib *b²*, adapted to enter the corresponding channel *a* of the jamb, it being understood, of course, that any desired number of interlocking ribs and grooves may be employed. To the door-frame A adjacent the rear edge of the door is fixed the pintle-plates D and D' of the hinge, two of such pintle-plates being shown in the drawings, and upon the pintles *d* of these plates D and D' are hung the movable sections E and E' of the hinge mechanism, the opposite ends of these movable sections E and E' being hung upon suitable pintles *f*, that pass through appropriate openings in the door-sections F F' of the hinge mechanism. Each of these door-sections F F' is provided, by preference, with the projecting plates or flanges *f'* and *f²*, through which pass the pintles *f*, and in the inner flanges or plates *f'* are formed suitable perforations to receive the ends of the shifting-rod G. Each end of this shifting-rod G is provided with a pin *g*, preferably formed in piece with the rod and having an eccentric position on its end, and the pin *g* at each end of the rod enters a slot *e*, that is formed

in the corresponding movable section E or E' of each hinge. These slots *e* of the movable sections E and E' are preferably open, as at *e'*, to admit the eccentric-pins when the parts
5 are being set in relative position for use upon the door.

From the construction of parts as thus far defined it will be seen that if the door be in closed position, as shown in Figs. 1 and 2 of the drawings, and the shifting-rod G be given
10 a partial revolution, the eccentric-pins *g* upon the end of this rod as the rod is turned bear upon the movable sections of each hinge, and since the outer ends of these movable sections
15 are held upon the fixed pintles *d*, the turning of the shifting-rod G will tend to move outward the opposite ends of the movable sections and carry with them the rear edge of the door until the parts assume the
20 position shown in Fig. 3, after which the door can be swung open, turning upon the pintles *d* after the manner of an ordinary hinge. It will be understood, of course, that when the door has been closed to the position shown in
25 Fig. 3, and it is desired to completely close it, it will only be necessary to turn the shifting-rod G in a direction opposite to that last described, thereby causing the ends of the shifting-rod, by reason of their engagement
30 with the movable sections E and E' and door-sections F and F', to force inward the rear edge of the door to the position shown in Figs. 1 and 2; hence it will be seen that a straight-line movement of the door can be attained in
35 order to cause the interlocking of the ribs and grooves upon the stepped edges of the door and jamb.

One great advantage incident to my improved construction of hinge mechanism is that inasmuch as the movable sections E and E' are held within the flanges *f'* and *f''* of the door-sections, they will be sustained by these flanges, and will thus be enabled to more effectively bear the weight of the door. Moreover, by thus forming the door-section F of the hinge with flanges *f'* and *f''*, between which the movable sections E and E' are held, the slot or opening formed in the movable section is hidden or protected, and so, also, the
50 upper end of the pintle *d* is in like manner covered, and its bearing is protected from all access of dust and dirt thereto.

In order to effect the movement of the shifting-rod G, I prefer to provide this rod
55 with a rocking arm H, to the forked end of which is pivotally joined, as at *h*, the connecting-bar I, the opposite end of this bar being in like manner joined to the forked end of a yoke *k*, that is fixed on the presser-bar K; hence it will be seen that when movement is imparted to the presser-bar K, and for this purpose an operating-handle K', affixed thereon will be employed, the shifting-rod G will be caused to turn and impart the
60 straight-line movement to the door in the manner above defined. The presser-bar K has its ends journaled within suitable plates

L, adjacent the edges of the door, and upon each end of this presser-bar K is a pin *k'*, having a position eccentric with respect to
70 the bar. These pins *k'* are preferably formed by turning down the ends of the bar to the desired extent. Upon the door-jamb and at points opposite the journal-plates L, when the door is in closed position, are fixed the cam-plates M, the inner face of each of these cam-plates being provided with a groove *m*,
75 adapted to receive the pin *k'* of the presser-bar, and by reference to the drawing, it will be seen that when the door has been swung to the closed position the pins *k'* of the presser-bar will enter the slots *m* of the cam-plates, and as the handle K' is turned to impart the movement to the presser-bar and shifting-rod necessary to effect the straight-
80 line movement of the door, the pins *k'* of the presser-bar will ride against the outward wall of the groove *m* of the cam-plate, and will force the outer portion of the safe-door to move inward in straight line at the same time
90 that the inner edge of the door is in like manner moved straight inward by the action of the shifting-rod upon the sections of the hinges. So, also, it will be seen that when the operating-handle K' is turned backward
95 to the position shown by dotted lines in Fig. 3 the pins *k'* of the presser-bar will be caused to ride against the inner wall of each groove *m* and then pass from out these grooves of the cam-plates M at the same time that the
100 pins *g* of the shifting-rod are effecting the straight outward movement of the rear edge of the door; hence it is plain that as the shifting-rod G is effecting the straight-line movement of the rear edge of the door a cor-
105 responding straight-line movement is given to the front portion of the door by the engagement of the eccentric-pins *k'* of the presser-bar K with the cam-plates L, and hence the entire body of the door will be
110 caused to move in unison.

Modifications in the precise details of construction above set out may suggest themselves to the skilled mechanic, and to such precise details, therefore, I do not wish my
115 invention to be understood as restricted.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A hinge mechanism for the doors of safes
120 and vaults, comprising fixed sections for attachment to the door and jamb, respectively, intermediate sections pivoted to said fixed sections, and a shifting-rod engaging with said fixed and intermediate sections to effect
125 their relative movement, substantially as described.

2. A hinge mechanism for the doors of safes and vaults, comprising fixed sections for attachment to the door and jamb, respectively,
130 intermediate sections pivoted to said fixed sections, and a shifting-rod, said shifting-rod being journaled in one set of said fixed sections, and being provided at its ends with eccentric-

pins, and said intermediate sections having long slots therein to receive the eccentric-pins of the shifting-rod, substantially as described.

3. A hinge mechanism for the doors of safes or vaults, comprising fixed sections for attachment to the door and jamb, respectively, intermediate sections pivoted to said fixed sections, and a shifting-rod journaled in one set of said fixed sections and provided with eccentric-pins at its ends, said intermediate sections being provided with long open slots between the pivotal points of said sections to receive the eccentric-pins of the shifting-rod, substantially as described.

4. A hinge mechanism for the doors of safes and vaults, comprising fixed sections for attachment to the door and jamb, respectively, one set of said fixed sections being provided with flanges and movable sections pivoted to said fixed sections and held between said flanges, substantially as described.

5. A hinge mechanism for the doors of safes and vaults, comprising fixed sections for attachment to the door and jamb, respectively, one set of said fixed sections being provided with flanges, movable sections pivoted to said fixed sections and held between said flanges, and a shifting-rod passing through one set of flanges and engaging with the movable sections, substantially as described.

6. A hinge mechanism for the doors of safes and vaults, comprising fixed sections D and F for attachment to the door and jamb, respectively, the sections F being provided with flanges f^1 and f^2 , and the intermediate sections E, located between the flanges of the sections F and pivoted to the sections D and F, and a shifting-rod G, the flanges f^1 of the sections F being provided with bearings for the shifting-rod, and the intermediate sections E being provided with slots to receive the ends of the said shifting-rods, substantially as described.

7. The combination, with the jamb and door of a safe or vault, of the hinge mechanism comprising the fixed sections for attachment to the door and jamb, respectively, movable sections pivoted to said fixed sections, and a shifting-rod engaging with said fixed and movable sections, a rocking arm upon said shifting-rod, a connecting-bar pivoted to said rocking arm, a presser-bar, suitable bearing-plates for said presser-bar, and cam-plates fixed upon the jamb for engagement with the eccentric-pins of the presser-bar, and an operating-handle, substantially as described.

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Witnesses:

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