No. 736,953. PATENTED AUG. 25, 1903.

J. H. FRY.

HINGE.

APPLICATION FILED JULY 2, 1900. RENEWED DEC. 19, 1901.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

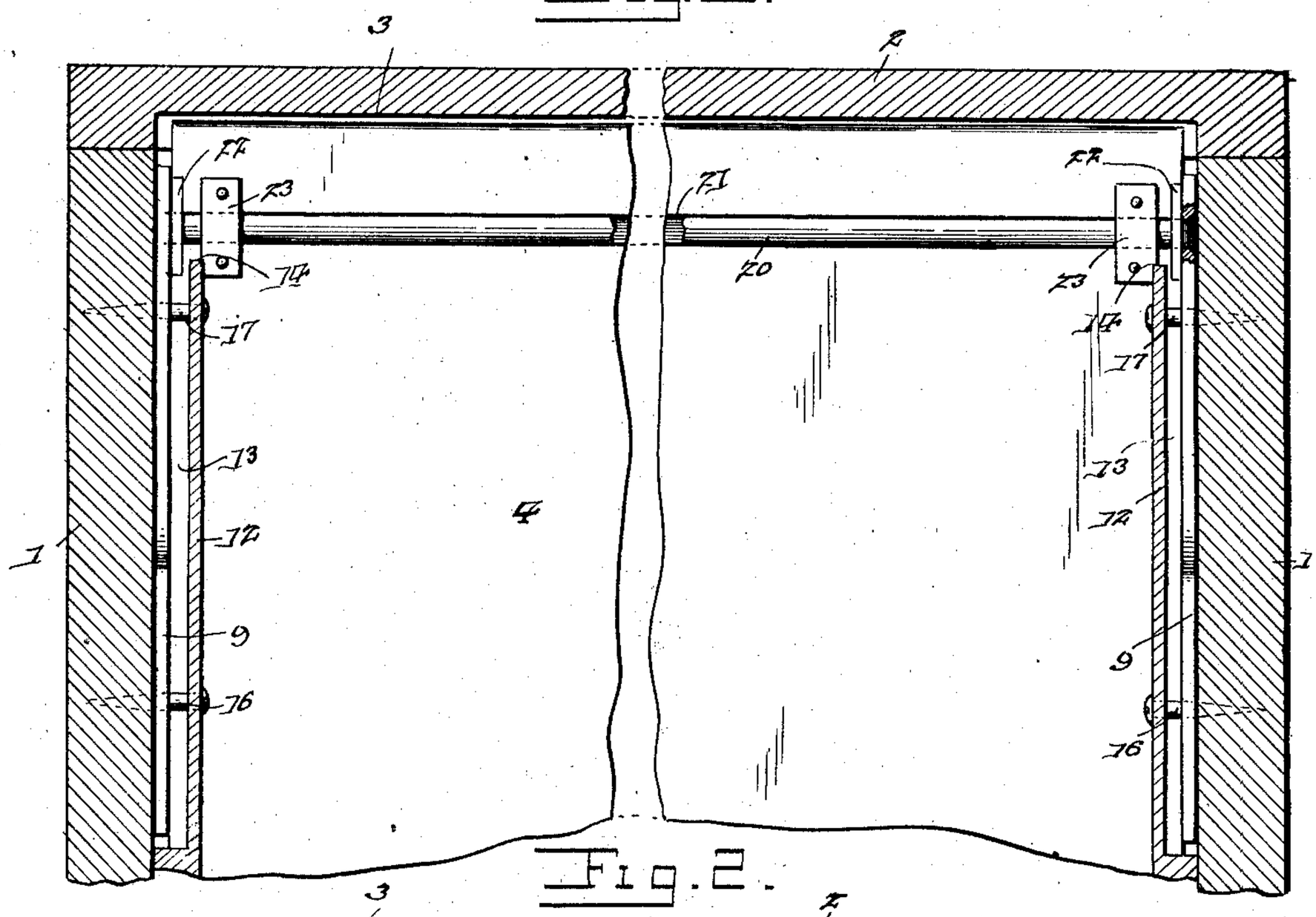
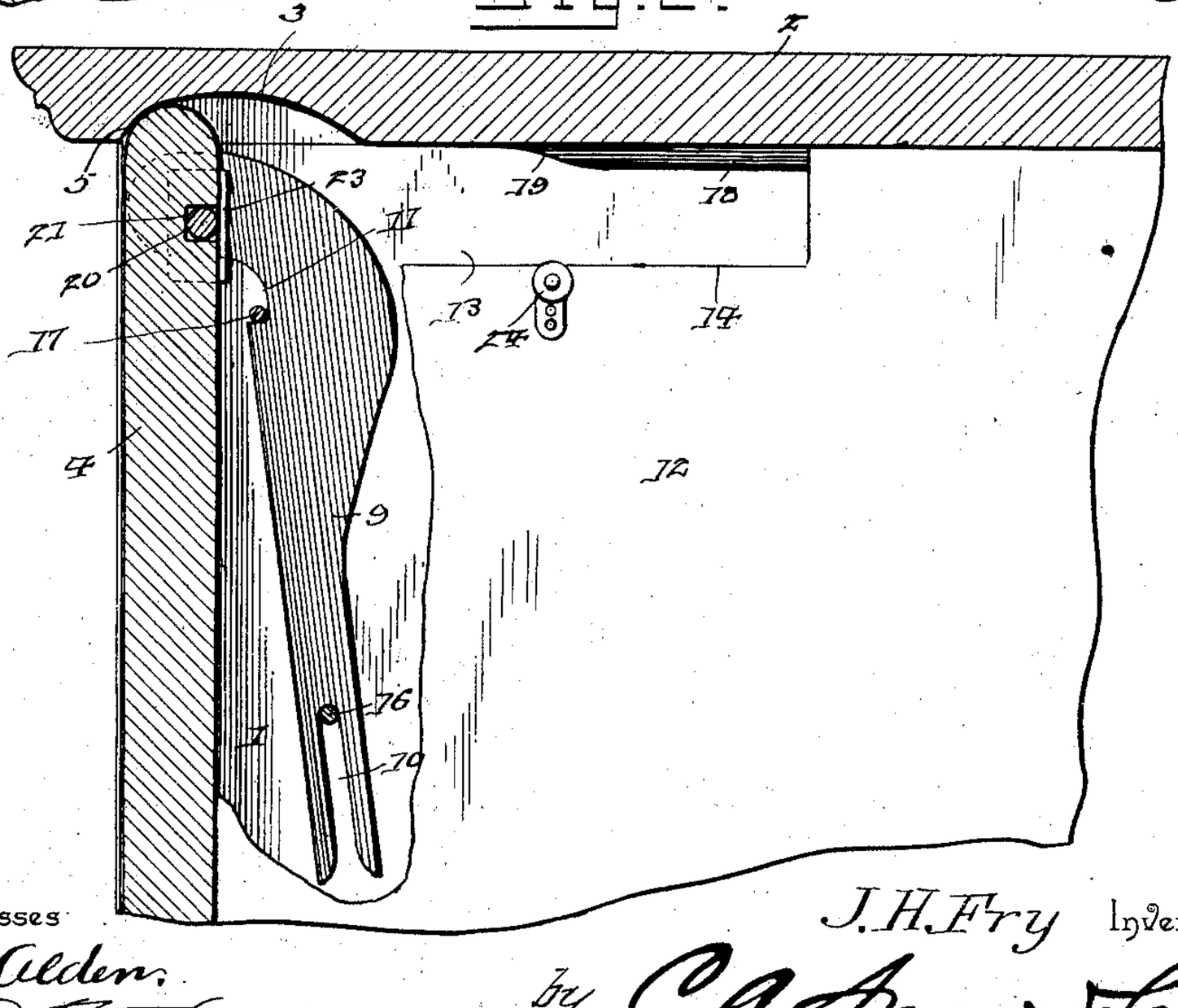


Fig. 2.



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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

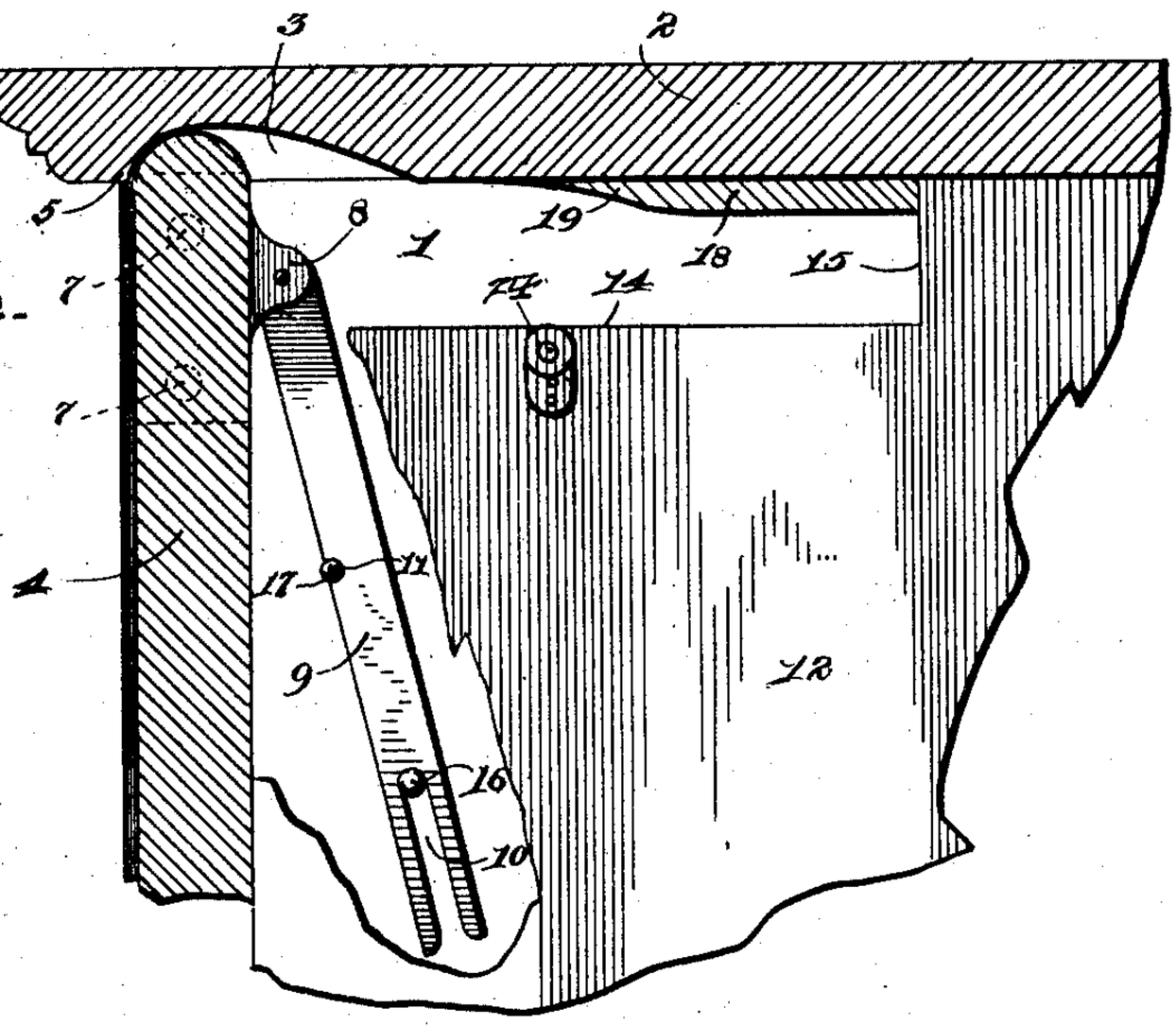


Fig. 5.

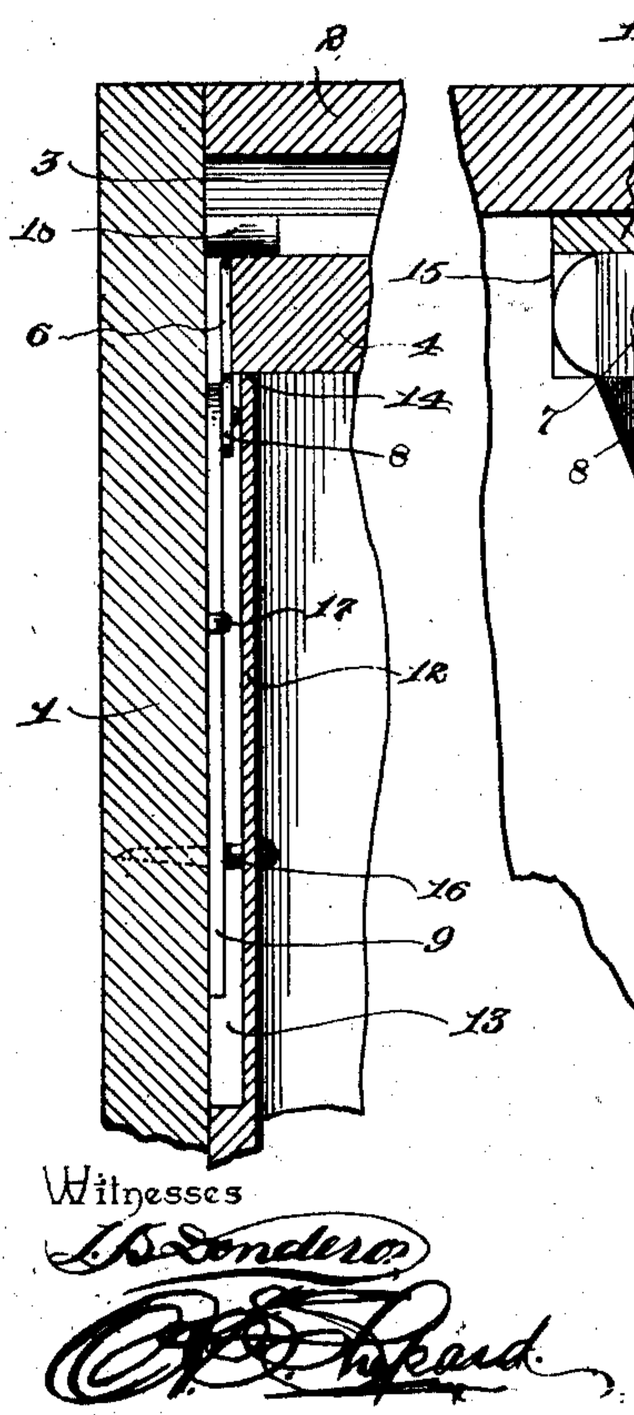
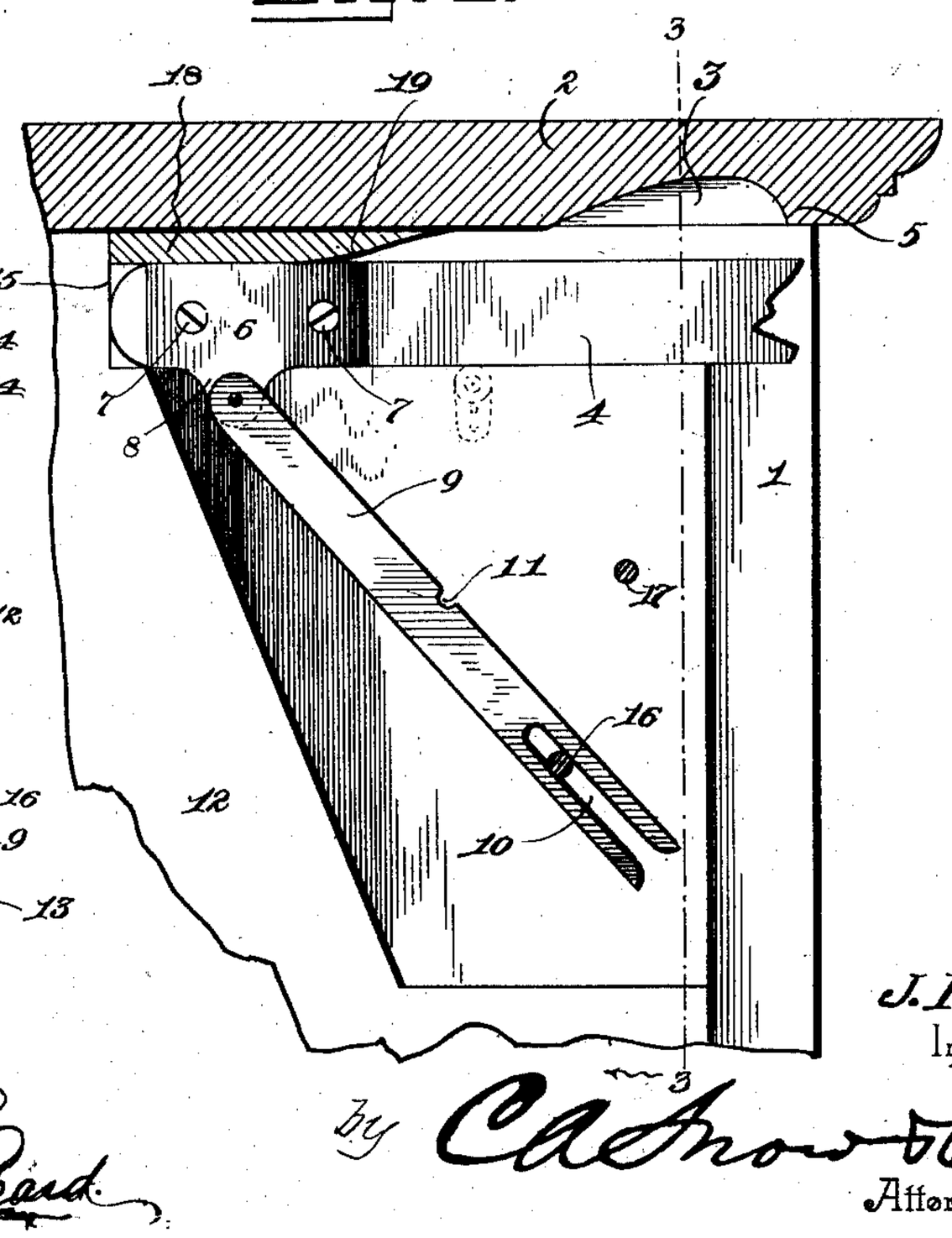


Fig. 4.



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No. 736,953. Patented August 25, 1903.

UNITED STATES PATENT OFFICE.

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HINGE.

SPECIFICATION forming part of Letters Patent No. 736,953, dated August 25, 1903.

Application filed July 2, 1900. Renewed December 19, 1901. Serial No. 86,563. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. FRY, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented a new and useful Hinge, of which the following is a specification.

This invention relates to hinges, and has for its object to provide an improved form of hinge which is especially designed for the mounting of drop-doors in bookcases, desks, and cabinets and to permit of said doors being slid or pushed inwardly into the cabinet after being swung upwardly upon their hinged connection. It is furthermore designed to have the door held rigidly in its closed position and at the same time free to be conveniently elevated and then pushed inwardly.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a longitudinal sectional view taken at the inner side of the door of a cabinet and showing the former closed and provided with the present form of hinge. Fig. 2 is a transverse sectional view taken adjacent to one end of the door. Fig. 3 is a view similar to Fig. 2 and showing a modified form of the hinge. Fig. 4 is a similar view looking in the opposite direction and showing the door elevated and pushed inwardly in its open position. Fig. 5 is a sectional view taken on the line 5 5 of Fig. 4.

Corresponding parts are designated by like characters of reference in all of the figures of the drawings.

Referring to the accompanying drawings, 1 designates the side of a cabinet, having a top 2, which is provided in its under side and adjacent to the front edge thereof with a socket or recess 3, that extends for the entire length of the door or leaf 4, the front wall of the socket being comparatively abrupt, so as to form a stop-shoulder 5, against which the inner upper edge of the door or leaf engages in the closed position thereof, as indicated in Figs. 2 and 3 of the drawings.

Referring more particularly to the form of the device as shown in Figs. 3, 4, and 5 of the drawings, it will be seen that each end edge of the door or leaf is provided with a fixed hinge member in the form of a plate 6, which is secured to the inner or rear end of the edge by means of screw-fastenings 7 and is provided with an intermediate laterally-projecting ear 8, which projects beyond the inner or under side of the door or leaf. Pivotally connected to the outer side of this ear and pendent therefrom is a movable member in the form of a long flat link or strap 9, the lower end of which is provided with a longitudinal slot or bifurcation 10 and has a notch 11 formed in the rear edge thereof intermediate of its opposite ends. This movable member hangs loosely adjacent to the inner face of the adjacent side or end of the cabinet and is held in place against lateral displacement by means of a plate 12, which is secured to the inner face of the end of the cabinet and is provided in its face with a lateral cut-away portion or recess 13 to accommodate and house the movable member of the hinge. Also the upper end of this plate is terminated short of the top of the cabinet, so as to form a supporting-shoulder 14 for the door or leaf when the latter is in its open position, and at the rear end of this shoulder the plate extends upwardly to the top 2, so as to form a stop-shoulder 15 to limit the inward movement of the door or leaf. The shoulder 5 of the groove 3 forms the jamb for the upper edge of the leaf when the leaf is closed to a perpendicular position, the leaf being carried upon the swinging links, the rounded upper edge of the door comes in contact with the inner surface of the groove 3 as the lid is closed and travels in contact therewith until it is stopped by the contact with the shoulder 5. Thus there is produced a closure at the upper edge of the leaf before the leaf is dropped down into a perpendicular position. This closure is practically air-tight and cushions the door as it falls.

The movable member of the hinge is movably or pivotally supported upon a suitable

pivot-pin 16, which is received within the slot or bifurcation 10 and is set through the plate 12 and into the adjacent side of the end of the cabinet. The outer swing or movement of the movable member is limited by a stop-pin 17, which projects laterally inward from the end of the cabinet and into the recess 13 in the plate, so as to engage the notch 11 in the front edge of the link 9, as shown in Fig. 3.

In the closed position of the leaf or door, as best shown in Fig. 3 of the drawings, it hangs downwardly against the front edge of the plate 12, so as to limit the inward swing of the lower end of the door, and the upper edge thereof is received within the socket or recess 3 in the top of the cabinet and also rests against the stop-shoulder 5 or the front wall of the recess. Also the stop-pin 17 is in engagement with the front edge of the movable member of the hinge. Thus the door is fixedly held in its closed position.

To open the door, the lower portion thereof is pulled outwardly and swung upwardly upon the pivotal connection between the fixed member and the movable member of the hinge until the door is in a horizontal position, after which it is pushed or slid inwardly upon the upper edge 14 of the plate 12 as a support. It will be understood that duplicate hinges and plates are provided for the opposite ends of the door. The position of the device is now changed from that shown in Fig. 3 to that shown in Fig. 4, with the door resting upon the upper edge of the plate 12 and its inner or upper edge fitting against the stop-shoulder 15 to limit the inward slidable movement of the door. It will of course be understood that this stop-shoulder may be located at any preferred distance from the front of the cabinet, so as to permit of the door being pushed partly or entirely into the interior thereof, as may be desired.

It will now be understood that the link 9 is designed to form a support for the door when it is being swung upwardly into a horizontal position, and the link is pivotally mounted to swing inwardly with the door as it is slid into the cabinet, while the slot or bifurcation 10 is to permit of a longitudinal movement of the link in following the movement of the door.

The purpose of the socket or recess in the under side of the top is to permit of a rocking movement of the door, and the slot or space between the shoulder 14 or top of the plate 12 and the under side of the top is a trifle greater than the thickness of the door, so that the latter may be easily and conveniently slid into the cabinet. Provided upon the under side of the top and at the inner limit of the door is a block 18, having its outer front edge beveled, as at 19, so as to form a wedge beneath which the inner portion of the door engages, so as to be fixedly held in its open position.

From the foregoing description it will be apparent that the opposite swinging links are entirely independent of each other, and therefore are liable to bind in opening and closing the door or leaf. To overcome this difficulty, the links have been connected by means of a connecting-rod 20, which is mounted to turn within a groove 21, formed in the inner or under side of the door or leaf and adjacent to the upper or inner edge thereof, as best shown in Fig. 1 of the drawings, the opposite ends of the rod being connected to the respective links, so that the latter are designed to move simultaneously, whereby the door is slid straight into the cabinet without binding against the opposite ends thereof. Fitted across each open end of the groove 21 is a bearing-plate 22, which has a perforation for the loose reception of the adjacent projecting end of the rod, the latter being angular and passed through a similar opening in the upper end of the link and then upset against the outer side of the link to fixedly connect the rod thereto. The rod is held within the groove by means of the opposite plates or straps 23, which are secured to the inner side of the door and extend transversely across the groove. Said straps 23 may be so attached as to be readily removed, or in place of said straps any suitable device may be used for retaining the connecting-rod on its groove in such a manner that the door can be readily detached. In this form of the device the upper end of each swinging link or member is preferably enlarged and made substantially L-shaped, so as to connect with the rod 20, and the notch 11 is located adjacent to the upper end of the link. Otherwise the construction and arrangement of the parts is the same.

In both forms of the device it may be found useful to provide an antifriction-roller 24, which is secured to the outer side of the plate 12 and projected slightly above the upper edge thereof, so as to support the door or leaf, and thereby facilitate the inward slidable movement thereof.

What is claimed is—

1. In a cabinet the combination of a leaf, links supporting the said leaf and placed at an outward incline, a jamb against which the upper edge of the door is brought in contact, said inclined links adapted to hold the leaf in contact with its jamb by the gravity of the said leaf, substantially as described.

2. The combination of a leaf, a groove 3 forming the jamb for the leaf, a pair of inclined links supporting the leaf and bringing the upper edge of the said leaf in contact with the inner surface of the groove as the leaf is lowered into this closed position, thereby forming a closure between the leaf and its jamb before the leaf is completely closed, substantially as described.

3. In a cabinet, a vertically-rocking and horizontally-slidable leaf, links pivotally con-

nected thereto and also pivotally supported upon the adjacent side of the cabinet, a plate placed so as to form a pocket between the end of the cabinet and the plate and provided with an upper edge forming a support for the leaf when in its horizontal position and a guide for the leaf when it is moved into and out of the case, substantially as described.

4. In a cabinet, a vertically-rocking and horizontally-slidable leaf, plates placed on the inner side of each end of the cabinet and having an upper edge forming a support for the leaf when in its horizontal position and a guide for the leaf when it is moved into and out of the case, substantially as described.

5. The combination with a leaf, which has independent rocking and slidable movements in directions at substantially right angles to each other, of a link, which is pivotally connected to the leaf, and a pivotal link-support independent of the leaf, said link having a rocking movement upon its support in the same direction as the slidable movement of the leaf.

6. The combination with a leaf, which has a vertically-rocking movement upon its upper edge as a center, and a horizontally-slidable movement at substantially right angles to its rocking movement, a link pivotally connected to the leaf, and a pivotal support independent of the leaf, said link having a rocking movement upon its support and in the direction of the slidable movement of the leaf, and a support for the leaf in its horizontal position.

7. In a cabinet, a vertically-rocking and horizontally-slidable leaf, of a link pivotally connected thereto and provided with a longitudinal slot, a pivot fixedly carried by the cabinet and loosely received within the slot, and a support for the leaf in the horizontal position thereof.

8. In a cabinet, a vertically-rocking and horizontally-slidable leaf, a link pivotally connected thereto, and also pivotally supported upon the adjacent side of the cabinet, and a plate also secured to the same side of the cabinet, the upper edge of the plate forming a support for the leaf in the horizontal position thereof.

9. In a cabinet, a vertically-rocking and horizontally-slidable leaf, a support for the leaf in its horizontal position, and a wedge located above the support and to bear against the leaf in its horizontal position.

10. In a cabinet, a vertically-rocking and horizontally-slidable leaf, a link pivotally connected to the leaf, and also pivotally supported upon the cabinet, a plate secured to the cabinet, and having a recess to receive the link, the upper edge of the plate forming a support for the leaf in its horizontal position, and also provided with an upwardly-directed stop-shoulder to limit the inward movement of the leaf.

11. In a cabinet, a vertically-rocking and horizontally-slidable leaf, a link pivotally connected to the leaf and also pivotally supported upon the cabinet, a stop to limit the forward swing of the link, and a support for the leaf in its horizontal position.

12. In a cabinet, a vertically-rocking and horizontally-slidable leaf, a plate secured to one end thereof and having a lateral ear, a link having its upper end pivoted to the ear, and provided at its opposite lower end with a longitudinal slot, a fixed lateral pivot-pin carried by the adjacent side of the cabinet and loosely received within the slot, a stop also carried by the cabinet and arranged in the path of the forward swing of the link, and a plate secured to the adjacent side of the cabinet, and provided in its inner face with a recess to receive the link, the upper edge of the plate terminating short of the top of the cabinet to form a support for the leaf in its horizontal position, and also having an upstanding stop-shoulder to limit the inward movement of the leaf.

13. The combination with a vertically-rocking and horizontally-slidable leaf, of opposite supporting-links which are pivotally connected to the leaf, pivotal link-supports independent of the leaf, and a rigid connection between the opposite links.

14. The combination with a vertically-rocking and horizontally-slidable leaf, of opposite supporting-links, opposite pivotal link-supports independent of the leaf, the latter having a longitudinal groove therein, and a rod loosely mounted in the groove and having its opposite ends fixedly connected to the respective links.

15. The combination with a vertically-rocking and horizontally-slidable leaf, having a longitudinal groove formed in the inner side and near the upper edge thereof, the opposite ends of the groove opening out through the opposite ends of the leaf, a rod loosely mounted within the groove and having its opposite ends projecting at the ends of the groove, opposite bearing-plates closing the ends of the groove and having perforations receiving the rod, plates or straps secured across the groove to hold the rod therein, opposite links fixedly connected to the respective projecting ends of the rod and opposite pivotal link-supports independent of the leaf.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN H. FRY.

Witnesses:
ELISHA O. STEVENS,
A. MERRIFIELD.