(No Model.) 2 Sheets—Sheet 1.

J. WOLF.

SPRING HINGE.

No. 461,909. Patented Oct. 27, 1891.

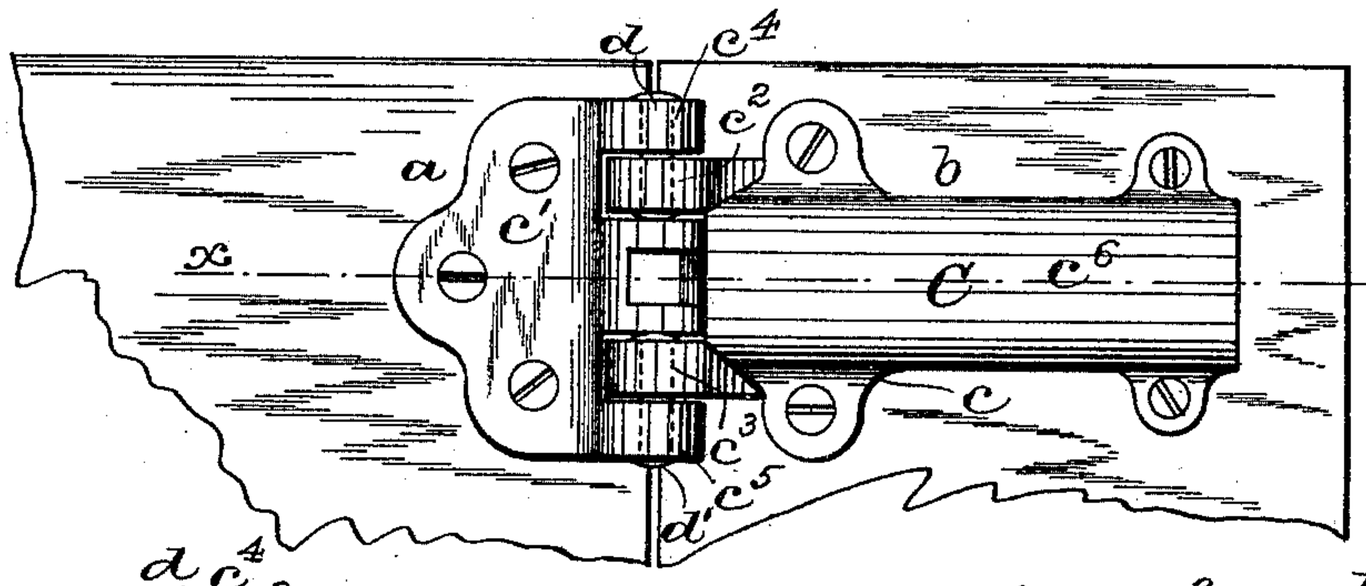

Fig. 1

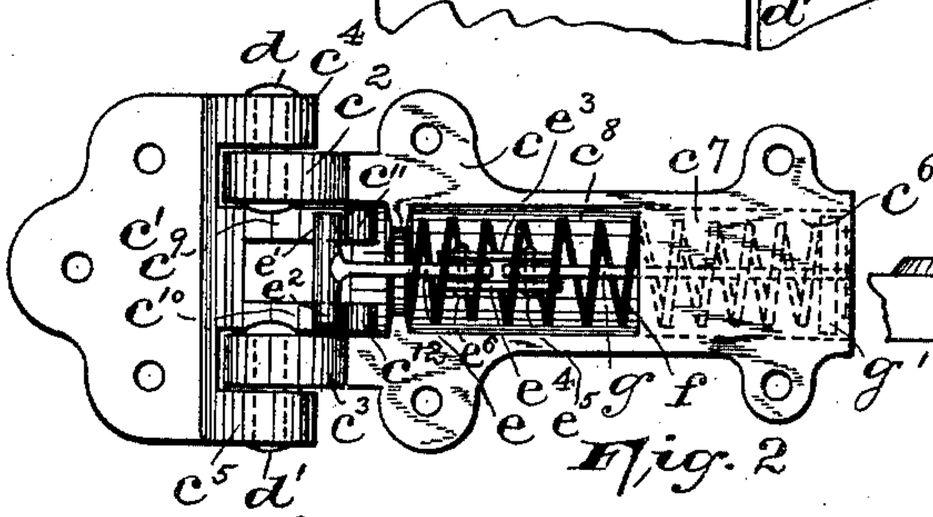

Fig. 2

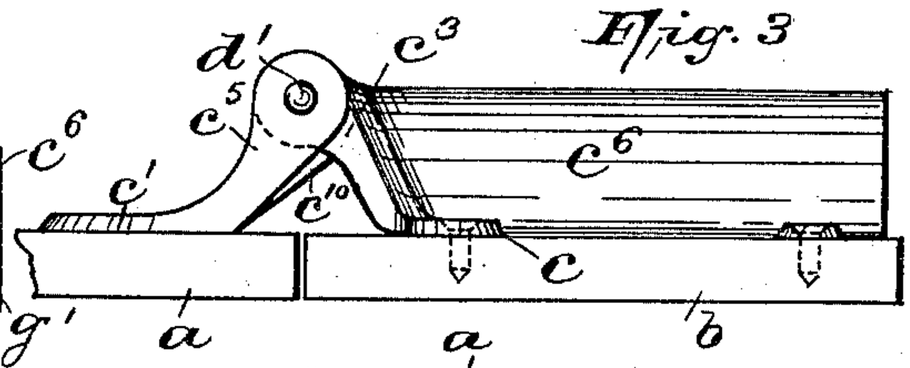

Fig. 3

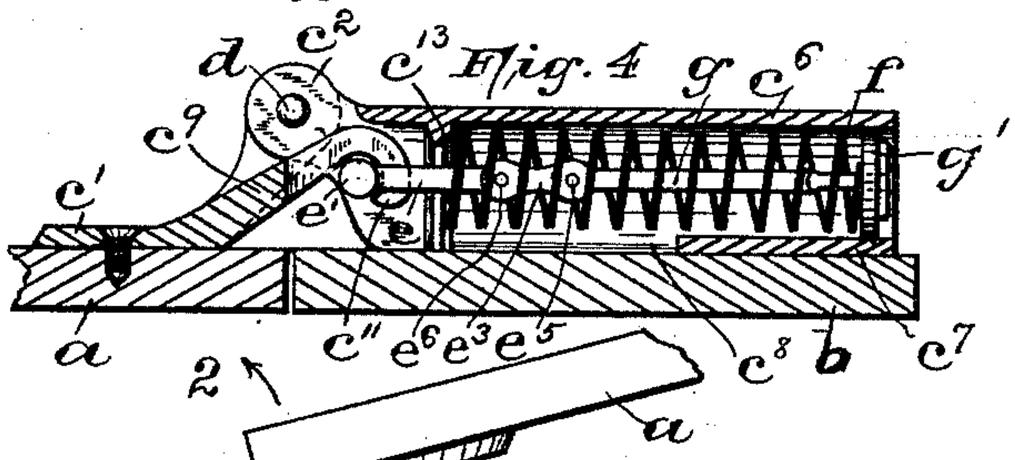

Fig. 4

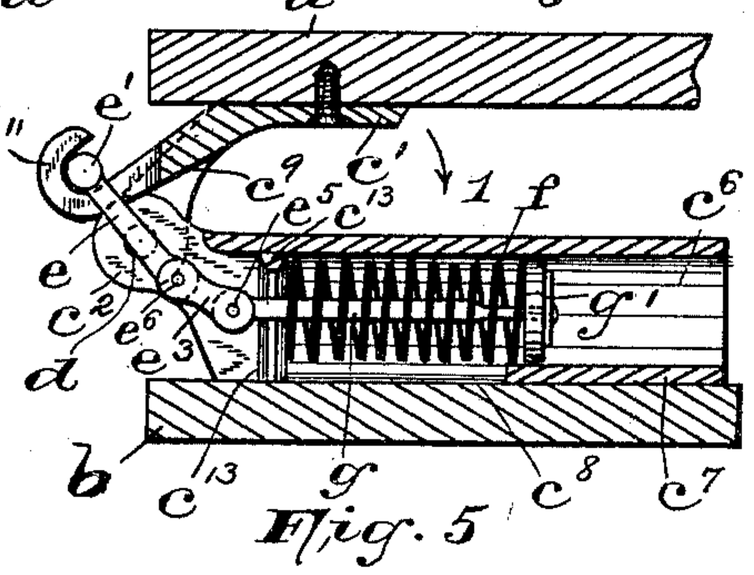

Fig. 5

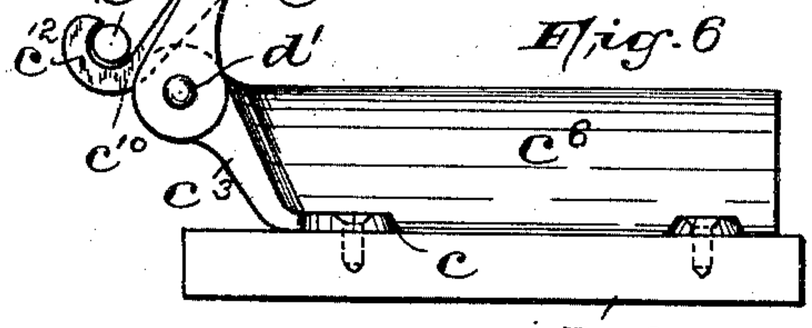

Fig. 6

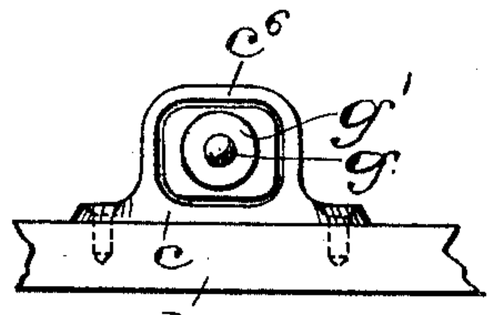

Fig. 7

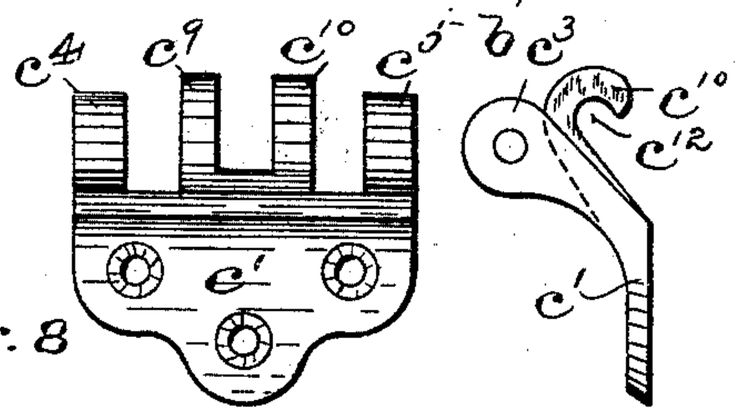

Fig. 8

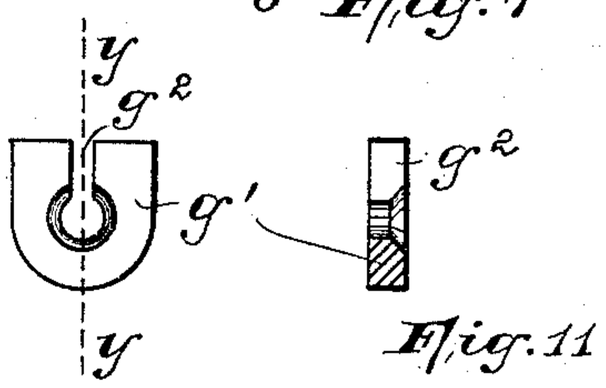

Fig. 11

Fig. 9 Fig. 10

WITNESSES:

Wm. H. Canfield.

Henry J. Falk.

INVENTOR:

Josef Wolf.

BY Fred'k C. Fraentzel, ATTY.

(No Model.) 2 Sheets—Sheet 2.

J. WOLF.

SPRING HINGE.

No. 461,909. Patented Oct. 27, 1891.

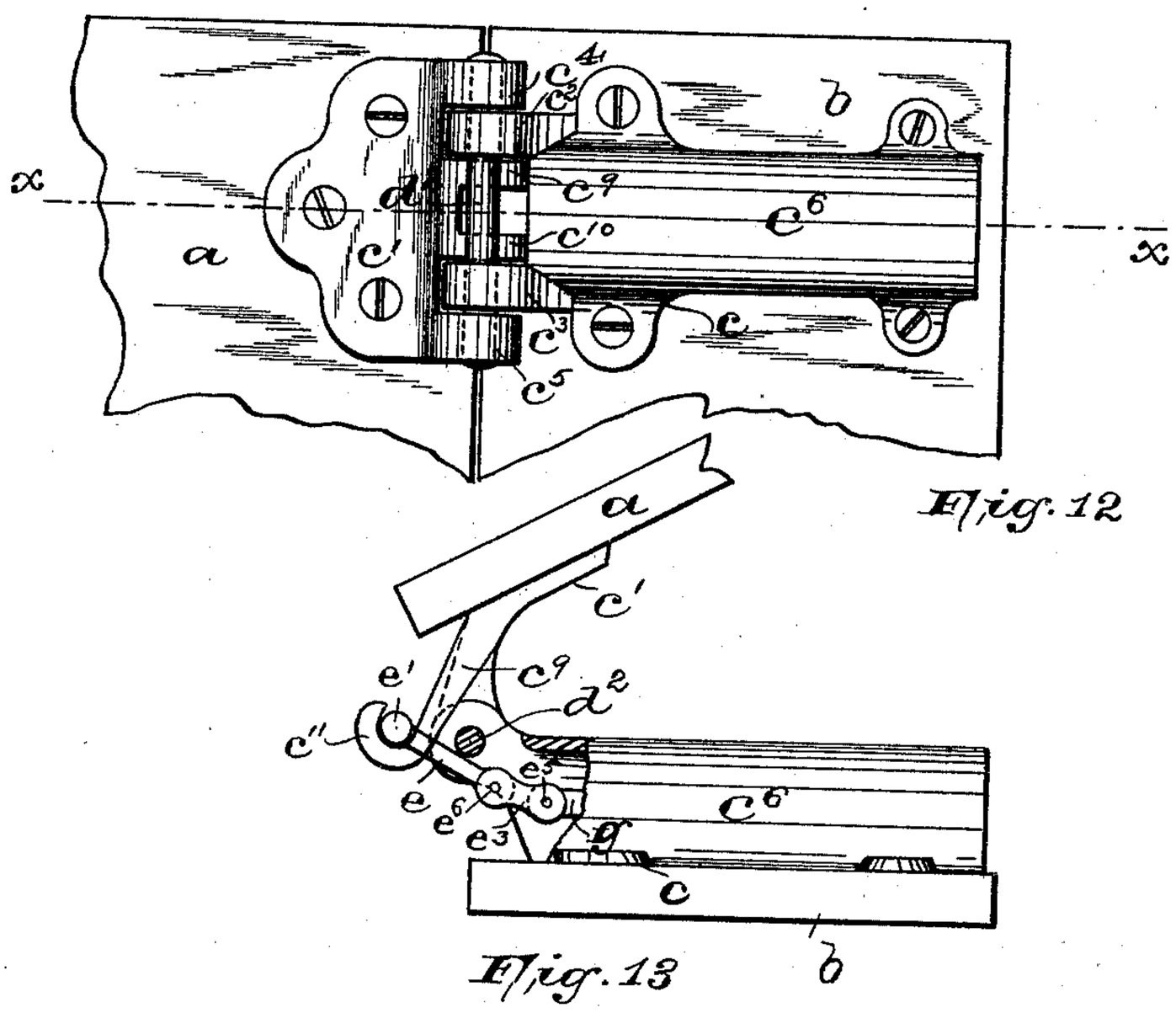

Fig. 12

Fig. 13

WITNESSES:

Wm. H. Canfield.

Henry J. Falk.

INVENTOR:

Josef Wolf.

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UNITED STATES PATENT OFFICE.

JOSEF WOLF, OF NEWARK, NEW JERSEY.

SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 461,909, dated October 27, 1891.

Application filed July 12, 1890. Renewed June 4, 1891. Serial No. 395,041. (No model.)

To all whom it may concern:

Be it known that I, JOSEF WOLF, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Combined Hinges and Springs for Doors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to an improved door-hinge, which serves the double purpose of an ordinary hinge for hanging doors, &c., and also as a door spring and check whereby the door is caused when entirely open to be reliably locked or held in such open position without any further mechanism other than that contained in one of the hinge leaves or plates comprising the hinge.

The invention consists of a cylinder on one of the leaves of the hinge, provided with a spring-actuated piston, which is in hooked engagement with the other of the hinge-leaves, whereby the door when partly opened is caused to be automatically closed and also when entirely opened is caused to be held in such position.

The invention is illustrated in the two sheets of drawings herewith accompanying, in which similar reference-letters are employed to indicate corresponding parts in each of the several views.

In said drawings, Figure 1 represents a front elevation of my improved hinge as attached to a door and its frame. Fig. 2 is a plan view of the under side of the hinge detached from the door, showing the arrangement of the several parts in the cylinder on one of the hinge-leaves in hooked engagement with the other of said leaves. Fig. 3 is a side elevation of the hinge, and Fig. 4 is a vertical section of the same, taken through line x in Fig. 1. Fig. 5 is a view similar to that represented in Fig. 4, illustrating the mechanism in position when the door is held in its opened position by the same; and Fig. 6 is a side view of the hinge, the parts thereof being represented in a position when they cause the automatic closing of the door. Fig. 7 is an end view of the hinge, showing the shape of the cylinder and its piston-head. Figs. 8 and 9 are a top view and side elevation, respectively, of the hook-shaped hinge-leaf. Fig. 10 is a modified form of piston-head, and Fig. 11 is a vertical section of the same, taken on line y in said figure. On Sheet 2 Fig. 12 is a top view of my improved hinge, in which the two hinge-leaves or plates are pivotally secured to each other by a continuous pin, instead of two short pins, as shown in the figures. Fig. 13 is a side elevation of the same.

In the drawings, a indicates the door, and b the door-frame.

C is my improved door-hinge, which consists of two leaves or plates c and c', adapted to be secured by means of screws to the door and door-frame, respectively. Said plates or leaves are provided with perforated ears c^2, c^3, c^4, and c^5, adapted to be fitted, as shown, and through each pair of said perforated ears c^2 and c^3 and c^4 and c^5 is driven a short pin d and d', as will be clearly seen from Figs. 1, 2, *et seq.*

One of the hinge-leaves, as c, is provided with a casing or cylinder c^6, which is partly closed on its under side at c^7 and open at c^8, as shown in Fig. 2. Said cylinder and the hinge-leaf c are preferably cast in one piece. Within said cylinder is arranged a rod g, provided at one end with a piston g', to which it may be securely riveted, as shown in Figs. 4 and 5, or said piston g' can be slotted at g^2, as in Figs. 10 and 11, and the rod g, which in this case is provided with a head or nut, is loosely fitted in said slot. At the other end said rod g connects with a bar e, having cross-arms e' and e^2 arranged at right angles thereto, which form a T-shaped bar by means of the oppositely-placed links e^3 and e^4, which are secured by the pin e^5 to the end of the rod g and by the pin e^6 to the T-bar e, thus forming a flexible and pivotal connection between said parts. The leaf c', which, as has been stated, is provided with the ears c^4 and c^5, has arranged between said ears two upwardly-extending arms c^9 and c^{10}, provided at their free ends with downwardly-projecting hooks c^{11} and c^{12}, as will be clearly seen from Figs. 2, 8, and 9.

When the leaves c and c', forming the hinge C, are in position on the door and its frame,

said T-shaped bar has been connected with said hook-arms c^9 and c^{10}, so that the arm e' rests in the hook c^{11} and the arm e^2 within hook c^{12}. Around the rod g is arranged a spiral spring f, between the piston-head and a projection or rib c^{13}, formed in the forward end of the cylinder.

The operation of the spring-actuated lock-hinge is as follows: When the several parts of the hinge have been secured upon a door and door-frame, leaf c' on the door, and leaf c on the frame, or vice versa, the several parts of the mechanism are arranged as represented in Figs. 1, 2, 3, and 4. When in this position, the spring f is at rest and does not act; but as soon as the door is opened, as indicated in Fig. 6, the leaf c' and its hook-shaped arms draw upon the T-shaped arm e, which causes the latter and the links e^3 and e^4 to approximately enter between the arms c^9 and c^{10} and also between the ears c^4 and c^5, as indicated in Figs. 5 and 6, the spring f being compressed between the piston-head g' and the rib c^{13}, whereby, when the door is only partly opened, as in Fig. 6, it will be caused to close automatically, owing to the tendency of the compressed spring to resume its normal and inoperative position, drawing, through the agency of the rod g and its connecting mechanism, upon said hook-shaped leaf c' and securely closing the door in the direction of arrow 2 in said Fig. 6.

The arms c^9 and c^{10} are formed at the proper angle to the base of the leaf c', so that when the door is entirely thrown back the action of the spring, which draws upon the rod g and the T-shaped arm e, causes the latter to act on a point on the hook-shaped arms on the leaf c' directly above the pivotal axes of the pins passing through the ears on the leaves c and c', whereby the door is entirely held in its open position and locked therein until closed by a person.

As indicated in Figs. 4 and 5, the under side of the cylinder is partly closed at c^7, upon which surface the piston-head g' reciprocates when the door is being opened and closed. Said under side can be entirely closed, if desirable.

In Figs. 12 and 13 I have shown the hinge-leaves secured to each other by a continuous pin d^2, instead of the separate pins d and d', as in the figures, in which case the hinge can be used as a combined hinge and door-spring for automatically closing the door, not being adapted to be used as a door-check to hold the door in its entirely-opened position.

As is clearly shown in Fig. 13, the upper edge of the T-shaped arm e strikes said pin d^2 when the door has been opened to a certain angle, which prevents the same from being thrown entirely open and held in that position by the spring and the connecting mechanism, as has been described.

My improved hinge is adapted for use on doors of all kinds, serving in the place of an ordinary hinge and dispensing with the use of separate door-springs and other devices for automatically closing the door. Another advantage is that it holds the door reliably in its open position until closed by a person, which is readily accomplished by taking hold of the door and giving a sufficient pull to overcome the tension of the spring.

Having thus described my invention, what I claim is—

1. In a combined hinge and door-spring, the hinge leaves or plates provided with ears for pivotally securing them together, one of said plates having hook-shaped arms, a cylinder on the other leaf, a piston and spring-actuated rod in said cylinder, a T-arm, and links connected with said rod, said T-arm being in pivotal engagement with the hook-arms on the one leaf, for the purposes set forth.

2. In a combined hinge and door-spring, the hinge leaves or plates provided with ears for pivotally securing them together, one of said plates having upwardly-extending hook-shaped arms, a cylinder on the other leaf, a spring-actuated rod in said cylinder, a piston having a slot g^2 therein, in which said piston-rod is loosely fitted, a T-arm, and links connected with said arm, thereby making a flexible connection, said T-arm being in pivotal engagement with the hook-arms on one leaf, for the purposes set forth.

In testimony that I claim the invention set forth above I have hereunto set my hand this 10th day of July, 1890.

JOSEF WOLF.

Witnesses:
FREDK. C. FRAENTZEL,
WM. H. CAMFIELD.