(No Model.)

A. A. OAT, Sr.

SELF CLOSING CONCEALED HINGE.

No. 521,546. Patented June 19, 1894.

Fig. 4.

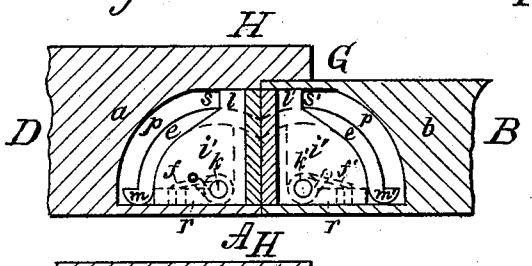


Fig. 5.

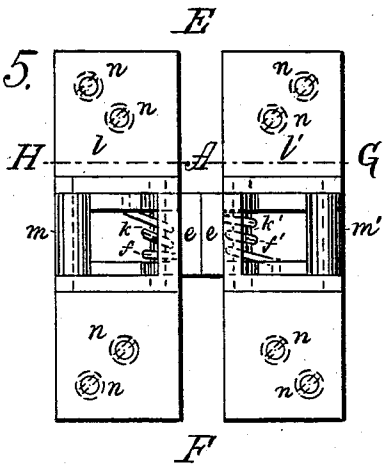


Fig. 3.

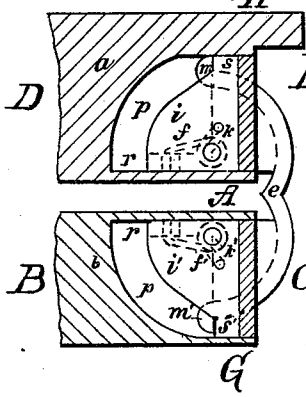


Fig. 1.

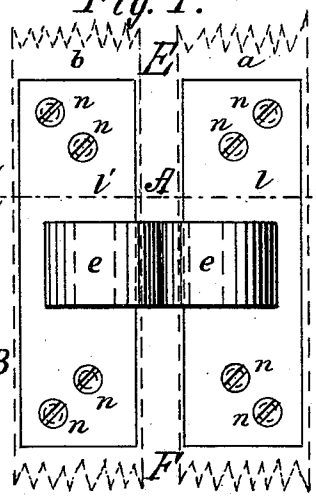


Fig. 2.

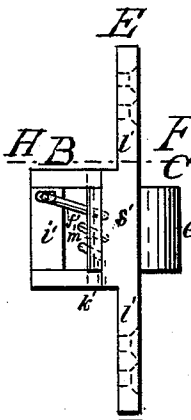


Fig. 7.

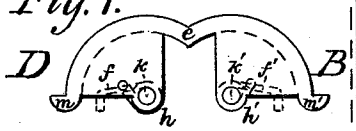


Fig. 8.

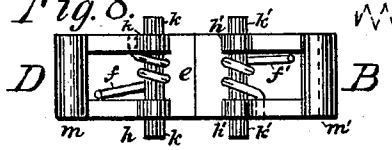


Fig. 9.

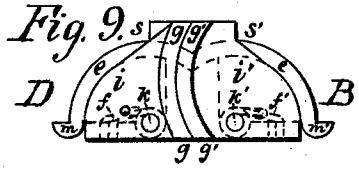
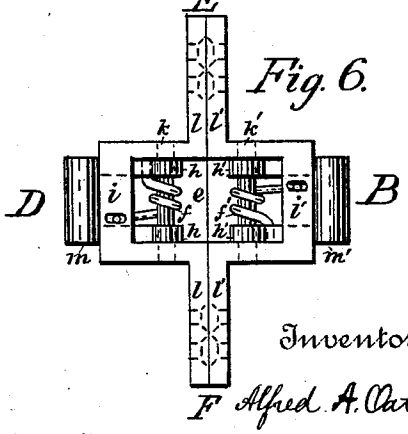


Fig. 6.



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ALFRED A. OAT, SR., OF PHILADELPHIA, PENNSYLVANIA.

SELF-CLOSING CONCEALED HINGE.

SPECIFICATION forming part of Letters Patent No. 521,546, dated June 19, 1894.

Application filed February 21, 1894. Serial No. 500,972. (No model.)

To all whom it may concern:

Be it known that I, ALFRED A. OAT, Sr., a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Self-Closing Concealed Hinges; and I do 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 the letters of reference marked thereon, which form a part of this specification.

My invention relates to a novel form of self-closing hinge for "hanging" doors, shutters, lids or other similar articles, which improved hinge with its self-closing mechanism will be concealed or invisible and will not project beyond the surface of the article so "hung" or "swung" when the door or lid is closed; and is an improvement upon the plain concealed hinge shown, described and claimed in my application for Letters Patent of the United States filed February 24, 1892, Serial No. 422,648. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal elevation E F, G H, of one of my improved self-closing hinges, having flat or straight "leaves" *l l'* opened and as it will appear when in use with the door or lid to which it may be attached swung open, and the two leaves connected by the double segmental curved link *e*, the dotted lines showing parts of the door and frame; Fig. 2, a longitudinal side elevation of my hinge, Fig. 1, looking from G toward A, and open; Fig. 3, a transverse section on line G H of Fig. 1, above the sockets *i i'* and on line B C of Fig. 2; one of my hinges being attached to a door, shutter or lid *b* and frame *a*, and swung open. Fig. 4 is a transverse section on same line as in Fig. 3, but with the door, shutter or lid *b* and hinge closed; Fig. 5, a vertical longitudinal elevation E F, G H, of one of my self-closing hinges open, and looking from B and D toward A of Fig. 3, being the reverse view of Fig. 1; Fig. 6 a longitudinal elevation of one of my self-closing concealed hinges closed and its double segmental curved link *e* connected with the sockets *i i'* of the leaves *l l'* by means of springs *f f'*, which by their elasticity will close the door to which the hinge is fitted after it is opened and released; Fig. 7, a detail plan view of one of my double segmental curved links *e*, with springs *f f'*; Fig. 8, a detail longitudinal elevation D B of Fig. 7; Fig. 9, a plan view of one of my self-closing concealed hinges having curved leaves *g g'*.

In all the figures, except Fig. 1, I have shown the springs *f f'*, *f* having one end attached to the walls of the socket *i* of my hinge, the other end of said spring *f* being attached to one half part of the double segmental curved link *e;* the other spring *f'* having one end attached to the walls of the socket *i'*, and the other end attached to the other half part of the double segmental curved link *e;* the springs *f f'* being shown in solid lines in Figs. 2, 5, 6 and 8; and in dotted lines in Figs. 3, 4, 7 and 9.

Similar reference letters indicate similar parts throughout the several views.

I am aware that "barrel" hinges have been made self-closing by cutting away a portion of each leaf and barrel and placing a coiled spring around their connecting pivot, one end of the spring pressing against one leaf and the other end against the other leaf and by its elasticity tending to press the two leaves apart and to keep the door closed when opened and released; the door being "hung" by having one leaf of the hinge attached to its face or exterior, the other leaf being attached to the face of the door frame or "jamb;" but this form of hinge with its spring is exposed, not concealed, when the door is closed; no concealed hinge has, to my knowledge, been made self-closing prior to my invention.

My invention consists of two leaves *l l'* each having one or more sockets *i i'* having abutments *s s'*, of a double segmental curved link *e*, one end of said link being loosely pivoted at *h* into the socket of one leaf *l* by the pivot *k*, the other end of the link *e* being loosely pivoted at *h* into the socket of the other leaf *l'* by the pin or pivot *k'* or the reverse, as the two ends of the link *e* may be made similar and interchangeable.

My double segmental curved link is com-

posed of two segments each subtending an angle of about or a little more than a quarter of a circle, and connected together at their intersection, as shown in horizontal section at A *e* Fig. 3; their respective centers at *h* and *h'* having pivots *k k'* which rotate or oscillate at *h h'* at fixed centers in the adjoining angles of the walls *i i'* of the sockets of their respective leaves *l* and *l'*, as in Fig. 3. I have shown stops *m m'* at the exterior ends of the double segmental curved link, which will necessarily be at or near the face *r r'* when the hinge is closed, as at Fig. 4, but when the hinge is opened as at Fig. 3, will be at *s s'*, and act as stops, preventing the door *b* from striking the frame or wall *a*, but they may be dispensed with if not wished for this purpose. The two segments of the double segmental curved link *e* are made hollow to admit springs *f f'* of which I attach one end of one spring *f* to one of the walls of the sockets *i* of my hinge, the other end of the spring being attached to its half part of the double segmental curved link *e;* the other spring *f'* being similarly attached to one of the walls of the other socket *i'* and to the other half part of the double segmental curved link *e*.

In the drawings I have shown one end of each spring *f f'* attached to its respective one of the walls of the two hollow segments of the double segmental curved link *e*, the springs *f f'* being loosely coiled around the pins *k k'*, the other end of each spring *f f'* being attached to its respective socket *i i'*.

I do not restrict myself to the use of springs *f f'* coiled around the pins *k k'* as shown, as any similar mechanical device may be used, and may be attached directly to the two parts to be connected, and may be coiled or curved as preferred.

In use, one leaf *l* of my self-closing concealed hinge with its socket *i* and spring *f*, containing one end *m* of the double segmental curved link *e*, are mortised into a cavity *p* and fastened by screws *n n* (or other suitable and well known means) into a frame *a*, giving space for the movement of the end or stop *m* of the walls of the socket *i*, a shoulder or abutment *s* being provided on the leaf *l* for the engagement of said stop *m* when the door *b* is open, the other leaf *l'*, with its socket *i'* and spring *f'*, containing the other end *m'* of the link *e*, being mortised into a cavity *p'* in the door or lid *b*, or the reverse as the two straight leaves *l* and *l'* and their sockets *i i'* may be made similar and interchangeable.

If desired one leaf of this hinge may be made concave as at *l* in Fig. 9, the other leaf convex as at *l'* in the same figure, or the reverse, but in this case the two leaves will not be interchangeable, although the entire hinge may be reversed end for end, so that the curvature of the leaves will be reversed.

The operation of my hinge is as follows:—Having the door or lid *b* closed, it will appear with the frame *a* in horizontal section as in Fig. 4, with the extreme ends *m m'* of the double segmental curved link at *r r'*, and in rear elevation as indicated by the dotted lines in Fig. 5, the link *e* being shown in detail in Figs. 7 and 8. By drawing or opening the door *b* toward *r* the double segmental curved link *e* will oscillate or partly rotate on its two centers or pivots *k k'* at *h h'* in the angles of the respective sockets in the leaves *l l'* until the door is opened to its fullest extent, when the ends *m m'* will have moved to *s s'*, the link *e* appearing as *e* Fig. 1 in vertical longitudinal elevation; and at Fig. 2 in side elevation looking from G toward H of Figs. 1 and 3. Opening the door and hinge as described will tighten and distort the springs *f f'* by drawing their ends farther apart as the relative positions of the parts *i i'* and the segments of *e* are changed, and when the door is released the springs *f f'* by their elasticity will have a tendency to resume their original positions drawing back with them the parts to which they are attached, thus making the hinge self-closing, closing the hinge and the door or shutter to which it is attached.

What I claim, and desire to secure by Letters Patent of the United States, is—

In a concealed hinge the combination of two leaves each having a socket, of a double segmental curved link pivoted therein at their respective centers, with springs attached to each half of said link, the other ends of said springs being each attached to its respective socket and leaf as and for the purposes shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

ALFRED A. OAT, SR. [L. S.]

Witnesses:
ARTHUR C. SNYDER,
ANNA W. SNYDER.