July 4, 1939. J. SOSS 2,164,757

CONCEALED HINGE

Filed July 22, 1937

Fig. 1.

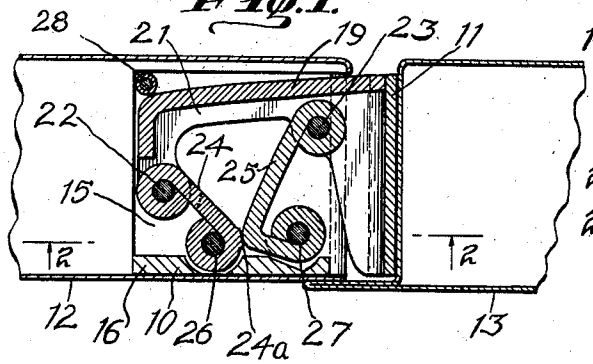


Fig. 2.

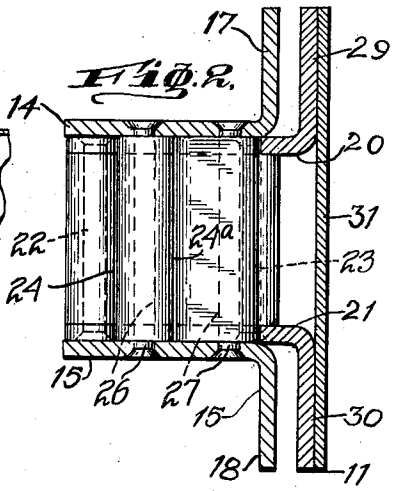


Fig. 3.

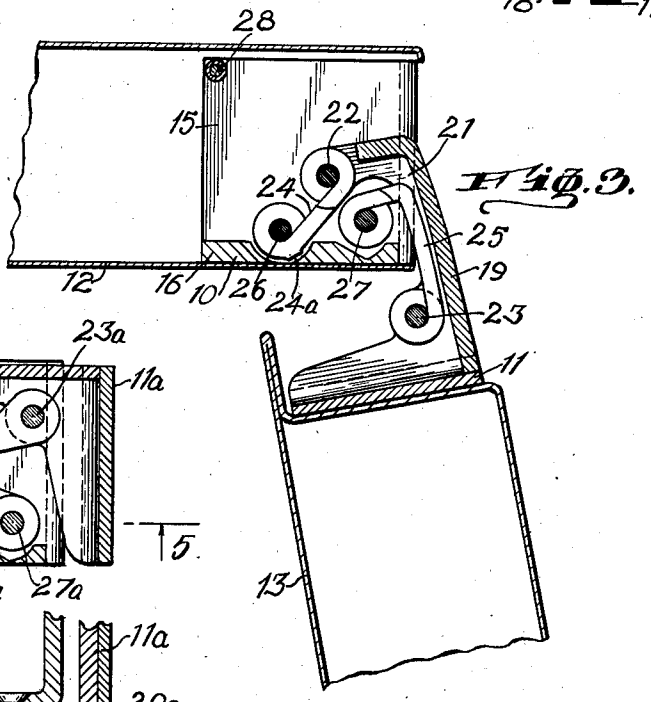


Fig. 4.

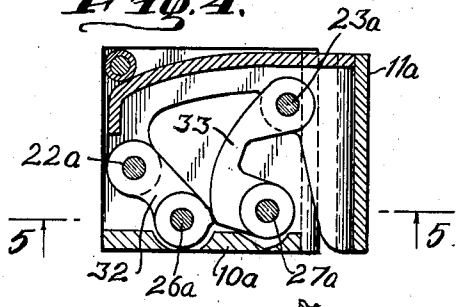
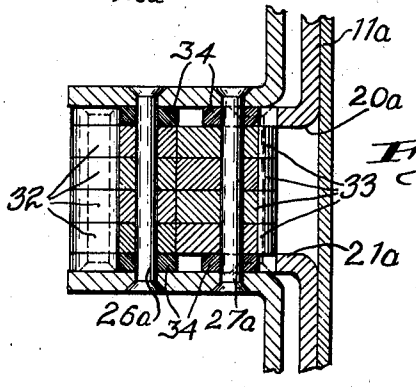


Fig. 5.



INVENTOR
JOSEPH SOSS
BY
ATTORNEY

Patented July 4, 1939

2,164,757

UNITED STATES PATENT OFFICE

2,164,757

CONCEALED HINGE

Joseph Soss, Roselle, N. J.

Application July 22, 1937, Serial No. 154,942

3 Claims. (Cl. 16—164)

This invention relates to what are known as concealed hinges wherein the separate butt parts, including the coupling links thereof, are disposed within the stationary support and swinging member when the latter is in closed position, so that the hinge becomes invisible externally of the support and swinging member, and the object of the invention is to provide a hinge of the class described with an improved butt and link construction whereby a comparatively wide throw of the swinging member is provided and a strong and durable mounting of the swinging member in the stationary support is provided when the latter is in open and closed position, and with these and other objects in view, the invention consists in a hinge of the class and for the purpose specified which is simple in construction, efficient in use, and which is constructed as hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which:

Fig. 1 is a cross sectional view through a hinge made according to my invention illustrating the method of its use.

Fig. 2 is a section substantially on the line 2—2 of Fig. 1.

Fig. 3 is a view similar to Fig. 1 showing the parts in a different position.

Fig. 4 is a view similar to Fig. 1 showing a modification, and

Fig. 5 is a section on the line 5—5 of Fig. 4.

In Figs. 1 to 3 inclusive I have shown at 10 and 11 the separate butts of a hinge, the butt 10 being secured to a stationary support 12, and the butt 11 to a door or swinging member 13. The butt 10 is in the form of a sheet metal housing consisting of top and bottom walls 14 and 15 joined at one side by a wall 16, and the forwardly or outer ends of the walls 14 and 15 have upwardly and downwardly extending attaching plate portions 17 and 18. The part 11 consists of a substantially hook-shaped wall portion 19 having inwardly projecting top and bottom flanges or bearing portions 20 and 21 substantially of the contour seen in Fig. 1 of the drawing to form bearings or supports for pintle pins 22 and 23 for coupling links 24 and 25 therewith, the link 24 being straight and extending to a pintle pin 26 mounted in the top and bottom plates 14 and 15 of the butt 10. The link 25 is in the form of a hook-shaped member, the other end of which has a bearing on a pintle 27 supported in the plates 14 and 15.

With the hinge construction shown in Figs. 1 to 3 inclusive, it will appear that the inner end of the hook-shaped portion 19 of the butt 11 swings through a straight and true arc governed by the straight link 24 while the remainder of the butt 11 swings in another arc to provide a comparatively wide throw of the door 13 as indicated in Fig. 3 of the drawing, at the result of which, the link 25 is substantially nested within the hook-shaped portion 19 or the top and bottom bearing walls 20, 21 of the butt 11.

It will be seen that when the hinge is in closed as well as open positions, the door or swinging member is rigidly and firmly supported against relative movement especially by virtue of the arrangement of the links one with respect to the other. In other words, when the hinge is in open position, the upper and lower surfaces of the link 25 are disposed within the walls 20, 21 which will naturally reinforce and strengthen the hook-end portion 19 of the butt to rigidly support the door in its open position. It will also be understood that while clearance is shown between adjacent surfaces of the wall of the hook 19 and the link 25, in Fig. 3, that these surfaces may substantially contact when the hinge is in open position for a further reinforcement. When the hinge is in closed position the projecting hook portion of the link 25 preferably engages a seat 24a on the link 24 adjacent the pintle pin 26 which forms a wedge-like connection between the parts securely retaining the hinge in closed position.

It is also preferred that the links 24 and 25 be of narrower widths where they couple with the walls 20 and 21 so as to take up the difference in the thickness of the material of said walls in properly seating in the top and bottom walls 14 and 15 of the butt 10. This same result can be accomplished by using links of a common width throughout and incorporating washers in the manner taught in Fig. 5 of the drawing.

It will also appear that a coupling and spacing pin 28 may be provided between the top and bottom walls 14 and 15 at the inner free corner portion thereof as seen in Fig. 1 to reinforce and strengthen the butt 10 and to maintain the proper support of the arm 19 of the butt 11 within and between said plates in the movement of the hinge to open and close the door.

The butt 11 is provided with wide attaching plate portions 29 and 30 extending upwardly and downwardly from the walls 20 and 21 for attach-

ment to the door or swinging member, and this plate may, if desired, be reinforced by a connecting strip of sheet metal 31 in order to aid in maintaining the spaced relationship of the walls or bearings 20 and 21 at the outer surface of the butt 11, as will be apparent.

In Figs. 4 and 5 of the drawing I have shown a slight modification of the structure shown in Figs. 1 to 3 inclusive, which consists primarily in substituting for the unitary links 24 and 25, built up or laminated links 32 and 33, which are substantially of the contour of the links 24 and 25. These links are attached to butts 10*a*, 11*a* similar to the butts 10 and 11 by arrangement on similar mounting or pintle pins 22*a*, 23*a*, 26*a*, and 27*a*. The only other substantial difference between the two structures consists in the use of washers 34 on the pins 26*a*, 27*a*, to make up for the thickness of the top and bottom walls 20*a*, 21*a* of the butt 11*a*, as clearly seen in Fig. 5 of the drawing. However, as above stated, this same arrangement may be provided in the structure shown in Figs. 1 to 3 inclusive.

It will be understood that the hinge shown in Figs. 4 and 5 will operate in the same manner as the hinge shown in Figs. 1 to 3 inclusive. In this connection it will be apparent that the particular manner of constructing the links as well as the respective butt parts may be modified to suit the requirements of a manufacturer. That is to say, it is not essential to use what may be termed sheet metal parts throughout, although this method of construction is possibly the most economical. When the laminated plates are employed, as in Figs. 4 and 5, separate plates may be welded or otherwise secured together to form a unit thereof.

With my improved linkage between the butt parts, it will appear that the separate parts are well reinforced in the several positions of the butts, one with respect to the other, especially by reason of the coupling of the links with the outer and inner end portions of the hook-shaped butt part. It will also be understood that by making the hook-shaped butt part of what might be termed channelled cross sectional form, this part becomes very strong and durable and also provides an enclosing hood which substantially conceals the links of the hinge when the hinge is in open position.

Having fully described my invention, what I claim as new and desire to secure by Letters Patenet, is:

1. In a concealed hinge of the class described comprising two butts movably connected by a pair of links pivoted to each butt, one butt comprising a sheet metal housing portion adapted to be countersunk in a stationary support, the other butt comprising a sheet metal hook-shaped arm adapted to be secured to a swinging member and movable into and out of the housing of the first named butt in the operation of closing and opening the swinging member, said arm comprising perpendicular outer walls arranged substantially at right angles to each other and terminating at upper and lower edges in inwardly extending integral flanges extending throughout the length of the angularly disposed perpendicular walls, said flanges being widened at one end portion of the arm and including integral outwardly or laterally projecting attaching plates for mounting the arm in connection with its support, and the flanges on said arm adjacent both end portions thereof being apertured to receive pintle pins for pivotally coupling the links with said arm.

2. In a concealed hinge of the class described comprising two butts movably connected by a pair of links pivoted to each butt, one butt comprising a sheet metal housing portion adapted to be countersunk in a stationary support, the other butt comprising a sheet metal hook-shaped arm adapted to be secured to a swinging member and movable into and out of the housing of the first named butt in the operation of closing and opening the swinging member, said arm comprising perpendicular outer walls arranged substantially at right angles to each other and terminating at upper and lower edges in inwardly extending integral flanges extending throughout the length of the angularly disposed perpendicular walls, said flanges being widened at one end portion of the arm and including integral outwardly or laterally projecting attaching plates for mounting the arm in connection with its support, the flanges on said arm adjacent both end portions thereof being apertured to receive pintle pins for pivotally coupling the links with said arm, means coupled with the attaching plates and joining said top and bottom flanges for reinforcing the hook-shaped arm where attached to the support, said housing having top and bottom bearing plates integrally joined at one side, the pintles for said links being arranged in the bearing plates adjacent the joined side thereof, and means coupling and bracing the inner free corner portions of said plates to maintain alinement thereof and to arrange the top and bottom bearing plates of the housing butt part in close proximity to the top and bottom flanges of the hook-shaped arm to provide a firm mounting of the arm within the housing butt part.

3. In a concealed hinge of the class described comprising two butts movably connected by a pair of links pivoted to each butt, one of said butts comprising a hook-shaped arm consisting of a long part and an angularly extending short part at the free end portion of the arm, both parts having vertical outer wall portions arranged substantially at right angles to each other, said arm having inwardly directed top and bottom flanges integral with upper and lower edges of said vertical walls to form an arm of substantially channel cross-sectional form throughout its length, said flanges being extended at the other end portion of the long part of said arm and including outwardly or laterally projecting parts forming attaching plates for mounting said hook-arm butt in connection with its support.

JOSEPH SOSS.