March 27, 1945. B. R. THIELE 2,372,303

STOP HINGE

Filed Nov. 23, 1942 2 Sheets-Sheet 1

Fig. 1.

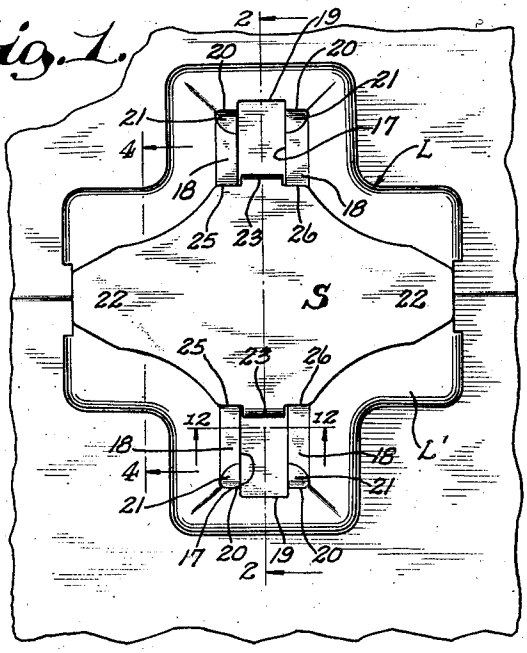


Fig. 2.

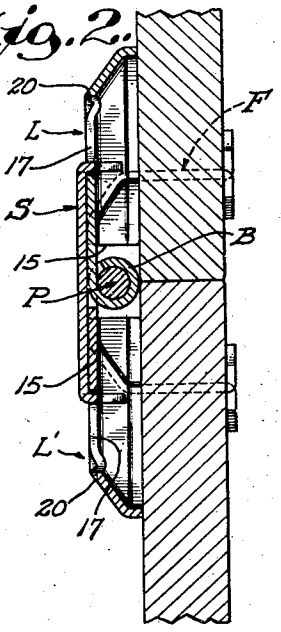


Fig. 3.

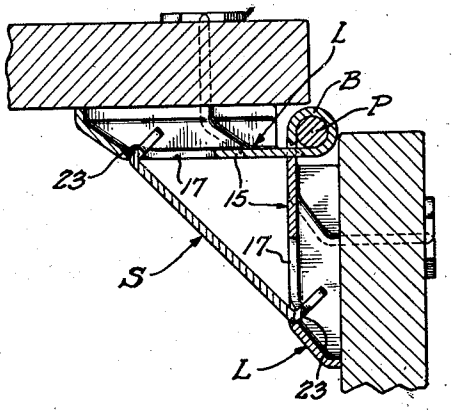
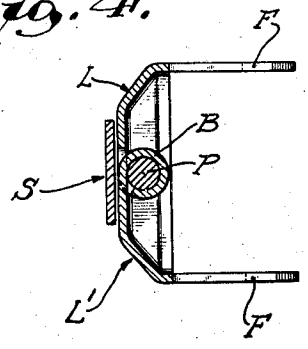


Fig. 4.



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March 27, 1945. B. R. THIELE 2,372,303

STOP HINGE

Filed Nov. 23, 1942 2 Sheets-Sheet 2

Fig. 5.

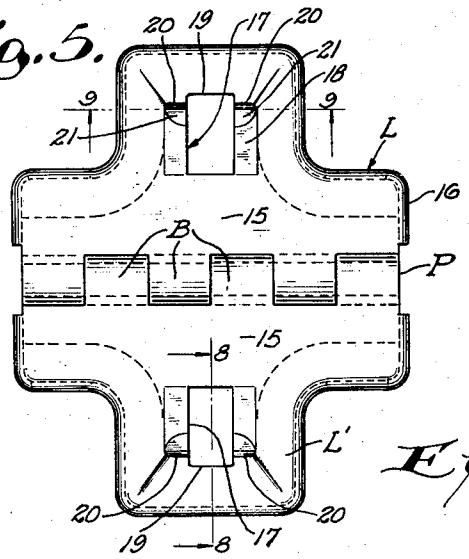


Fig. 8.

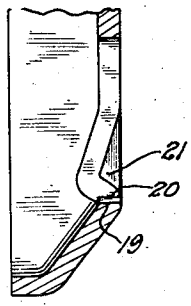


Fig. 9.

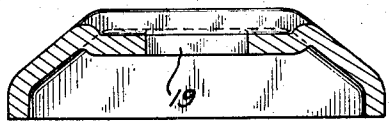


Fig. 6.

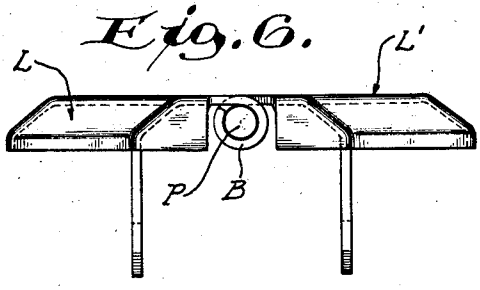


Fig. 10.

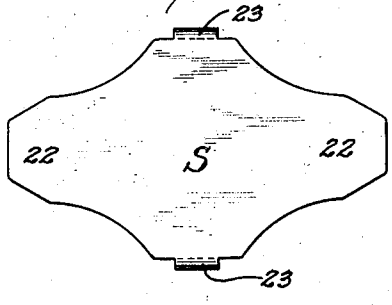


Fig. 7.

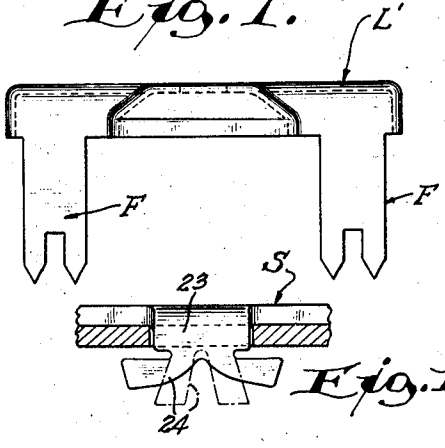


Fig. 11.

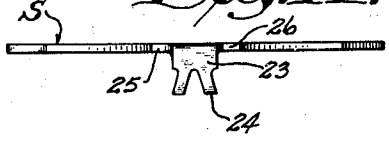


Fig. 12.

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UNITED STATES PATENT OFFICE

2,372,303

STOP HINGE

Berthold R. Thiele, Milwaukee, Wis., assignor to E. R. Wagner Manufacturing Company, Milwaukee, Wis., a corporation of Wisconsin

Application November 23, 1942, Serial No. 466,570

6 Claims. (Cl. 16—138)

This invention relates to an improvement in stop hinges—that is, a hinge of the type which embodies in its construction means for limiting the opening movement of the hinge leaves and which employs for this purpose a stop plate lying against the outer surfaces of the hinge leaves and slidably interconnected at its ends therewith.

The object of the invention is to so constitute and so organize a stop hinge of this character that when the stop plate functions to limit the opening movement of the hinge leaves, it takes the stresses set up therein in compression and does this in such an advantageous way that the full compressive strength of the stop plate and of the hinge leaf structure is utilized, all of the parts being relieved of bending stresses.

Another object of the invention is to constitute the hinge leaves as box-like structures and so combine the hinge barrels and their pintle pin therewith that the stop plate serves to conceal them as well as to exert its highly effective action heretofore described. This feature also makes it practical to embody the stop plate in such an ornamental and complete form that it serves to conceal the hinged barrel and pintle pin and provide not only a stop hinge but a hinge of cover plate type.

A further object of the invention is to provide a hinge having these advantages and capacities, and which is simple and compact in its construction, requiring far less parts than any stop hinges or cover plate hinges heretofore proposed, and to accomplish these advantages while providing a structure which may be economically produced from materials and by means of facilities ordinarily available.

Other objects and advantages reside in certain novel features of the construction, arrangement, and combination of parts, which will be hereinafter more fully described and particularly pointed out in the appended claims, reference being had to the accompanying drawings forming a part of this specification, and in which:

Figure 1 is a view in top plan of a hinge embodying the present invention, fragments of the parts to which the hinge is attached being shown;

Figure 2 is a sectional view taken on line 2—2 of Figure 1 and looking in the direction of the arrows and illustrating the hinge when it is closed;

Figure 3 is a view similar to Figure 2 but showing the hinge open;

Figure 4 is a view in section taken on line 4—4 of Figure 1 and looking in the direction of the arrows;

Figure 5 is a view in top plan illustrating the hinge structure with the stop plate removed;

Figure 6 is a view in side elevation of the structure shown in Figure 5;

Figure 7 is a view thereof in end elevation;

Figures 8 and 9 are cross sectional views taken on lines 8—8 and 9—9 respectively of Figure 5;

Figure 10 is a detail view in top plan illustrating the stop plate;

Figure 11 is a view similar to Figure 10 but showing the stop plate in end elevation; and

Figure 12 is a fragmentary sectional view taken on line 12—12 of Figure 1 and showing the bifurcated guide lug of the stop plate in full lines as finally assembled, and in dotted lines as it is positioned for assembly.

Referring to the drawings it will be seen that the hinge embodying the present invention comprises, generally, a pair of hinge leaves, designated as a whole at L and L'. The hinge leaves L and L' are of identical construction and each is of box-like or flanged structure and is equipped with a suitable number, for example three, hinge barrels B, which, in the assembly, are interfitted and pivotally interconnected by a pintle or hinge pin P. Fastening prongs F, integral with the hinge leaves L—L', are employed to secure the hinge leaves to the parts to be hinged together. A stop plate S is combined with the hinge leaves L and L' in a manner which will be hereinafter more fully described.

Each hinge leaf has a body plate 15 substantially flat and of general T-shaped outline, as illustrated in the drawings. Around its other edges the body plate 15 of each hinge leaf is provided with an integral downturned marginal flange 16, which flange gives the box-like structure to the hinge leaf. With a box-like structure of this character the barrels B may be formed downwardly—that is, they may be located within or below the plane of the top of the body plate 15 of the hinge leaf. This way of constructing and organizing the barrels with the hinge leaves is a feature that permits of the use of a properly constituted stop plate, and which also lends the construction to a concealed covered hinge type.

In the body plate 15 of each hinge leaf a slot 17 of suitable dimensions and proportions is provided. Each slot 17 is formed with flats 18 along its side and marginal edges, providing tracks or guides. The outer end of each slot 17 is notched, as at 19, and is formed with stop shoulders 20 on each side of the notch. Just in front of the stop shoulders 20 depressions 21 are provided in the tracks 18.

The stop plate S is of the outline shown in the drawings and consists of a flat, rather thick and strong, stiff piece of metal. For the purposes of ornamentation, and to serve also as a cover plate, its sides 22 are extended and of sloping or tapered shape, as shown in the drawings, and its ends are formed with downturned guide lugs 23. Each guide lug 23 has its lower end bifurcated, as at 24. In the assembly, the stop plate S is placed over the hinge leaves and the guide lugs

23 pass down into the slots 17. After the lugs 23 have been assembled with the slots 17, a suitable tool is utilized to spread the bifurcated ends of the guide lugs 23 so as to interlock them with the hinge leaves L and L', while, of course, allowing relative sliding movement of these parts. On each side of each guide lug 23 the stop plate is formed with stop shoulders, designated at 25 and 26.

With this construction, when the hinge is closed, the stop plate S lies flush up against the hinge leaves L and L' in the manner shown in Figures 1 and 2, and presents a highly ornamental appearance with the hinged barrel B and the pintle pin P concealed. When the hinge is open the parts shift from the position shown in Figure 2 to the position shown in Figure 3. In this position the stop plate is at a forty-five degree angle, and is lined up with the similarly inclined flanges of the hinge leaves. The shoulders 25 and 26 of the stop plate at this time abut the shoulders 20 at the outer ends of the slot 17 so that the stress or force involved in the bracing or strut-like action of the stop plate S is applied directly to the stop plate. The guide lugs 23 are entirely or substantially entirely relieved of stress and strain. Furthermore, the stop plate S so coacts with the inclined flanged formation of the hinge leaf, and is so interrelated therewith or relatively positioned with respect thereto, as to take the stress in compression. No bending stresses are set up in the stop plate.

While I have shown and described one construction in which the invention may be advantageously embodied, it is to be understood that the construction shown has been selected merely for the purpose of illustration or example, and that various changes in the size, shape, and arrangement of the parts may be made without departing from the spirit of the invention or the scope of the subjoined claims.

I claim:

1. A stop hinge of the character described comprising a pair of box-like hinge leaves, each having a plate-like body portion formed with hinge barrels along one edge and a marginal flange around other edges, said hinge barrels being of downwardly rolled formation, with the roll formations lying below the mean plane of the top of the plate-like bodies of the hinge leaves, a pintle pin pivotally interconnecting said hinge barrels, the body portions of the hinge leaves having alined lengthwise slots, said body portion being provided with stop shoulders spaced at intervals from the outer ends of said slots, a flat stop plate overlying the hinge leaves and having guide lugs slidably interfitted with said slots, said stop plate having stop shoulders on the opposite sides of each of the guide lugs, whereby in the open position of the hinge force is directly applied from the stop shoulders of the hinge leaves to the stop shoulders of the stop plate and the guide lugs are substantially entirely relieved of stress.

2. A stop hinge of the character described comprising a pair of box-like hinge leaves, each being formed with hinge barrels along one edge, said hinge barrels being of downwardly rolled formation, a pintle pin pivotally interconnecting said hinge barrels, said hinge leaves having alined lengthwise slots and being formed with tracks paralleling the margins of said slots, the hinge leaves having fixed stop shoulders adjacent the outer ends of the tracks, the tracks being formed with depressions just in front of the stop shoulders, a flat stop plate overlying the hinge leaves and having guide lugs slidably interfitted with said slots, said stop plate having stop shoulders on the opposite sides of its guide lugs directly engageable with the stop shoulders of the hinge leaves in the open position of the hinge so that the stresses set up by virtue of the action of the stop plate in the open position of the hinge are directly transmitted by said shoulders to the stop plate and are taken by the stop plate in compression and the guide lugs are substantially entirely relieved of stress.

3. A stop hinge of the character described comprising a pair of box-like hinge leaves, each having a body portion formed with hinge barrels along one edge and a marginal flange around other edges, said hinge barrels being of downwardly rolled formation, with the roll formations lying below the mean plane of the top of the plate-like bodies of the hinge leaves, a pintle pin pivotally interconnecting said hinge barrels, the body portions of the hinge leaves having alined lengthwise slots, a flat stop plate overlying the hinge leaves and having guide lugs slidably interfitted with said slots, said stop plate having stop shoulders on the opposite sides of each of the guide lugs, said hinge leaves having cooperable stop shoulders on the opposite sides of and spaced inwardly from the outer end of their slots, whereby in the open position of the hinge force is directly applied from the stop shoulders of the hinge leaves to the stop shoulders of the stop plate and the guide lugs are substantially entirely relieved of stress.

4. A stop hinge of the character described comprising a pair of box-like hinge leaves, each being formed with hinge barrels along one edge, said hinge barrels being of downwardly rolled formation, a pintle pin pivotally interconnecting said hinge barrels, said hinge leaves having alined lengthwise slots, the hinge leaves having fixed stop shoulders adjacent and spaced inwardly from the outer ends of the slots, a flat stop plate overlying the hinge leaves and having guide lugs slidably interfitted with said slots, said stop plate having stop shoulders on the opposite sides of its guide lugs directly engageable with the stop shoulders of the hinge leaves in the open position of the hinge and the guide lugs are substantially entirely relieved of stress.

5. A hinge of the character described comprising a pair of box-like hinge leaves, each being formed with hinge barrels of downwardly rolled formation, a pintle pin pivotally interconnecting said hinge barrel, said hinge leaves having alined slots and having fixed stop shoulders adjacent and spaced inwardly from the outer ends of the slots, a combined cover and stop plate overlying the hinge leaves and having guide lugs slidably interfitted with said slots, said plate having stop shoulders directly engageable with the stop shoulders of the hinge leaves in the open position of the hinge, said combined cover and stop plate being flat and being so dimensioned and proportioned as to completely conceal the hinge barrels in the closed position of the hinge.

6. A stop hinge comprising a pair of journalled hinge leaves, slots in said leaves, depressions in said leaves adjacent said slots to provide stop shoulders spaced inwardly from the outer ends of said slots, and a stop plate having guide lugs interfitted with said slots and also having shoulders adapted to engage with said stop shoulders to maintain the hinge in angular open position without the stress being placed on said lugs.

BERTHOLD R. THIELE.