Oct. 30, 1951 J. J. ENDER 2,573,096

COMBINED HINGE, COVER SUPPORT, AND CHECK

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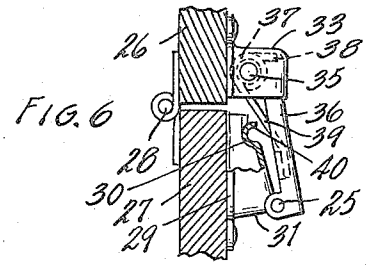


FIG. 6

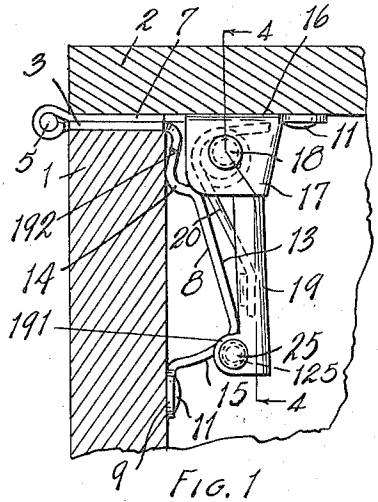


FIG. 1

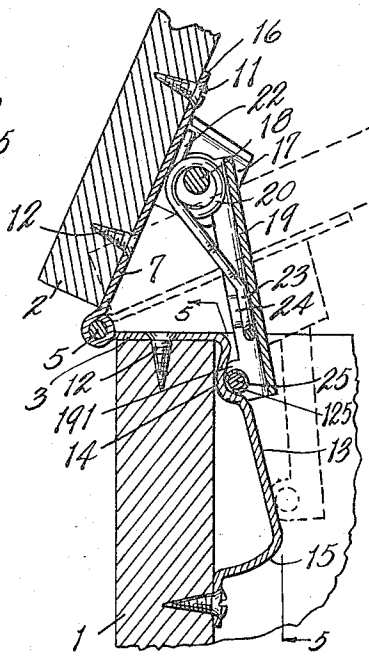


FIG. 2

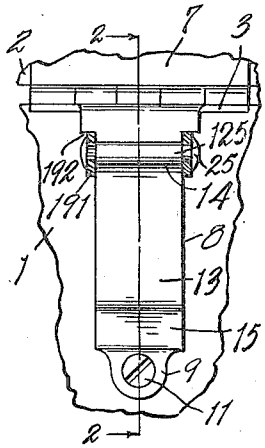


FIG. 5

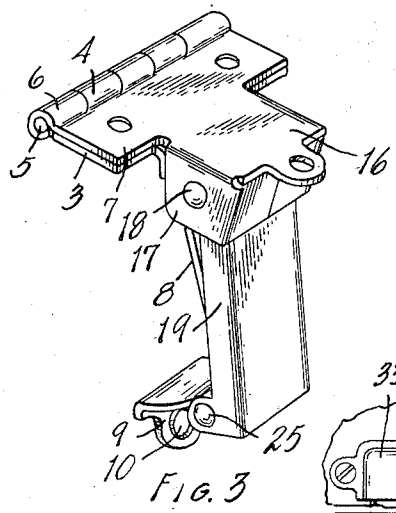


FIG. 3

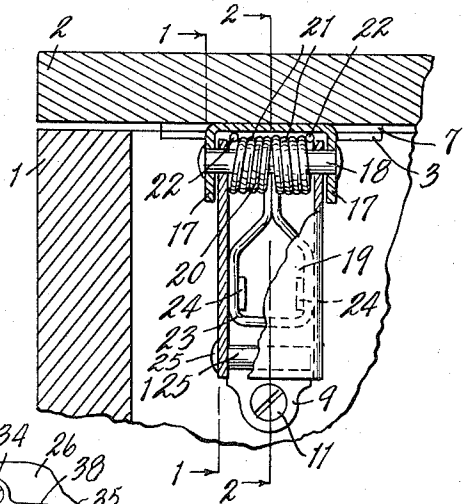


FIG. 4

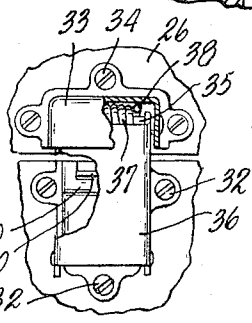


FIG. 7

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COMBINED HINGE, COVER SUPPORT, AND CHECK

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1

The main objects of this invention are:

First, to provide a cover support and check member which is effective in supporting the cover in open position and at the same time permits the cover being pulled downwardly, also serving as an effective check to control the cover in its final movement.

Second, to provide a combined hinge and cover support and check which is easily applied, is compact, and at the same time highly efficient.

Third, to provide a structure having these advantages which is attractive in appearance and not likely to become inoperative or inefficient in use.

Objects pertaining to details and economies of the invention will definitely appear from the description to follow. The invention is defined in the claims.

A structure which embodies the features of my invention is clearly illustrated in the accompanying drawing, in which:

Fig. 1 is a side elevation of a structure embodying the features of my invention applied to the lid of a cabinet with the lid in closed position, the cabinet and lid being sectioned on line 1—1 of Fig. 4.

Fig. 2 is a fragmentary view in section on line 2—2 of Figs. 4 and 5 with the lid or cover in open position.

Fig. 3 is a perspective view of the unit in closed position.

Fig. 4 is a fragmentary view mainly in section on a line 4—4 of Fig. 1.

Fig. 5 is a fragmentary view partially in section on broken line 5—5 of Fig. 2.

Fig. 6 is a side elevation of a modified form or embodiment of my invention.

Fig. 7 is a front elevation of the modification of Fig. 6.

In the accompanying drawing 1 represents a cabinet and 2 the lid or cover thereof. In Figs. 1 to 5 of the accompanying drawing the invention is illustrated as embodied in a combined hinge, cover support and check. In Figs. 6 and 7 the invention is illustrated as embodied in a combined check and support. In the embodiment of Figs. 1 to 5 the base member 3 is in the form of a leaf hinge member and has knuckles 4 on its rear edge adapted to receive a pintle 5 engaging complementary knuckles 6 on the swinging hinge member 7. The base member 3 is provided with an angularly disposed keeper arm or support 8 having an ear 9 at its lower end perforated at 10 to receive an attaching screw 11 by means of which it is secured to the

2

inner side of the cabinet. The base member is secured to the upper edge of the cabinet wall by means of the screws 12. The keeper support has an upwardly inclined camming surface 13 of substantial length merging into the recess-like keeper 14 and also into the shoulder-like keeper 15. It will be noted by reference to Figs. 1 and 2 that the base member 3 is an elongated plate-like member of substantially uniform thickness from end to end thereof, and provides at one end thereof the knuckles 4 of the hinge joint to the hinge member 7, and provides between the opposite ends thereof the spaced keepers 14 and 15 and the camming surface 13 between said keepers. This plate-like member is curvedly bodily offset at the opposite ends of the camming surface 13 relative to the general direction of the camming surface to provide said spaced keepers. This structure facilitates the ready assembly of the hinge, camming, and keeper members as a unit to the enclosure wall, provides a relatively strong rigid structure after assembly and facilitates the ready and economical production of the same by merely stamping flat stock material to shape.

The swinging member 7 is provided with holes adapted to receive attaching screws 11 and 12, the screw 11 engaging the end of the arm 16 of the member 7. The arm 16 has laterally turned ears 17 carrying the pin 18 which engages the flanges of the channel shaped supporting or latching and check arm 19 which is of channel section and arranged to face rearwardly. The tensioning spring 20 is preferably formed in two coils 21 arranged on the supporting pin or pivot 18, the outer ends of the coils being extended at 22 into arm-like terminals engaging the inner side of the arm 16 of the swinging hinge member. The inner ends of the coils are extended into a loop 23 which is engaged over lugs 24 turned inwardly from the edges of the flanges of the arm 19 so that the arm 19 is biased or urged under spring tension against the keeper support. The rivet 25 extending between the flanges of the arm 19 at its outer end provides a keeper engaging member for the arm. The rivet is preferably provided with a roller 125.

When the lid or cover is in its fully open position the keeper engaging member 25 engages in the recess-like keeper 14 and is urged into such engagement by the spring tension on the arm. When the lid is pulled downwardly the member 25 travels out of the keeper and additional spring thrust is imparted to the arm, this increasing as the keeper engaging element trav-

els along the camming surface 13. The tension of the spring is such as to fully check the closing of the lid or cover or other closure as it approaches closed position so that manual pressure is required to fully close the closure. In the closed position the keeper engaging element 25 engages over the shoulder-like keeper 15, thus requiring substantial force to move the closure from its closed position. This is of particular advantage when the structure is being transported as it prevents rattling, keeps the cover firmly closed and prevents any opening thereof such as might occur if the second keeper were not provided. It will be noted by reference particularly to Figs. 1 and 2 that the surface of each of the keepers 14 and 15 adjacent the camming surface 13 is sloping or inclined relative to the direction of travel of the arm 19 produced by swinging the hinge member 7, for releasing the arm from the keeper 14 when the cover is forcibly moved from an open to a closed position and for releasing the arm from the keeper 15 when the cover is forcibly moved from a closed to an open position.

In the embodiment of the invention shown in Figs. 6 and 7 the cover or closure 26 is of the box type, being secured to the cabinet 27 by means of separate hinges 28. The keeper support 29 is substantially the same as that described in the preferred embodiment, with the exception that it is not formed as a part of the hinge. This keeper support is provided with the recess-like keeper 30 at its upper end and a shoulder-like keeper 31 at its lower end. The support 29 is secured to the inner side of the cabinet by means of the screws 32. The swinging member 33 is secured on the inner side of the rear wall and the cover 26 as by means of the screws 34. This swinging member carries a pin 35 on which the combined support and check arm 36 is pivoted, the coiled spring 37 being arranged on the pin 35 and provided with anchoring or thrust arms 38 engaging the member 33 and with a loop-like arm 39 connected to the arm 36. The fixed end members parts function the same as described with the exception as stated that the combination does not constitute a hinge.

Both structures are provided with means for limiting the opening movement of the closure. In the embodiment shown in Figs. 1 to 5 this stop means is in the form of shoulder-like stops 192 formed in the upper end of the keeper recess 14 to be engaged by the coacting stops 191 on the arm 19. In the embodiment shown in Figs. 6 and 7 the tongue-like stop 40 is struck out at the upper edge of the keeper 30 to engage the transverse pin 25 which constitutes a coacting stop.

I have illustrated and described the invention in highly practical commercial embodiments. I have not attempted to described other embodiments and adaptations as it is believed this disclosure will enable the adaptation of my invention as may be desired.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. A combination hinge, cover support and check comprising a base hinge member having an angularly disposed keeper support provided with a keeper recess at its upper end and an inclined camming surface extending from said keeper and terminating in a second shoulder-like keeper, said keepers merging into said camming surface, a coacting swinging hinge member pivotally connected to said base member and provided with laterally spaced pivot ears, a supporting arm of inwardly facing channel section having one end disposed between said ears, a pivot carried by said ears extending through the flanges of said arm, said arm having a cross piece at its other end engaging said keeper support and adapted to engage said keepers thereof at the ends of the movement of said swinging hinge member and to ride on said camming surface in intermediate positions of the swinging hinge member, and a double coiled spring arranged on said pivot between the flanges of said arm, the outer ends of the coils having anchoring terminals engaging said swinging member, the inner ends of said coils being extended to provide a connecting loop-like arm disposed within the channel of said supporting arm and engaged therewith to urge the arm against said keeper support.

2. A combination hinge, cover support and check comprising a base hinge member having an angularly disposed keeper support provided with a keeper recess at its upper end and an inclined camming surface extending from said keeper and terminating in a second shoulder-like keeper, said keepers merging into said camming surface, a coacting swinging hinge member pivotally connected to said base member and provided with laterally spaced pivot ears, a supporting arm of inwardly facing channel section having one end disposed between said ears, a pivot carried by said ears extending through the flanges of said arm, said arm having a cross piece at its other end engaging said keeper support and adapted to engage said keepers thereof at the ends of the movement of said swinging hinge member and to ride on said camming surface in intermediate positions of the swinging hinge member, and a spring arranged on said pivot between the flanges of said arm in anchoring engagement with said swinging member and biasing engagement with said arm to urge the arm against said keeper support.

3. A device for hingedly and supportingly mounting a cover on an enclosure wall comprising a base member adapted for attachment to the enclosure wall and having a keeper support provided with spaced keepers and an inclined camming surface between said keepers, a coacting swinging member adapted for attachment to the cover and pivotally connected to said base member, said base member and swinging member constituting coacting hinge members of a hinge for hingedly connecting the cover to the enclosure wall, an arm pivotally connected to said swinging member to coact with said keeper support, and a double coiled spring arranged on the pivot of said arm, the outer ends of the coils having anchoring terminals engaging said swinging member, the inner ends of said coils being extended to provide a connecting loop-like arm engaged with said arm to urge it against said keeper support, the surface of each keeper adjacent the camming surface being inclined relative to the direction of movement of the arm produced by swinging the swinging member for releasing the arm from the keeper upon forcibly swinging the swinging member, said base member being an elongated plate-like member of substantially uniform thickness from end to end thereof and providing at one end thereof a hinge portion for connection to said coacting swinging member and providing between the opposite ends thereof said keepers and the camming

surface between said keepers, and being curvedly bodily offset at the ends of the camming surface relative to the general direction of the camming surface to provide said keepers.

4. In a device for hingedly and supportingly mounting a cover on an enclosure wall, a base member adapted for attachment to the enclosure wall and having a keeper support provided with a keeper and an inclined cammed surface extending from said keeper, a coacting swinging member adapted for attachment to the cover and pivotally connected to said base member, said base member and swinging member constituting coacting hinge members of a hinge for hingedly connecting the cover to the enclosure wall, an arm pivotally connected to said swinging member to coact with said keeper support to engage said keeper of the keeper support at one end of the movement of said swinging member and to ride on said camming surface in intermediate positions, and a spring biasing said arm against said keeper support, the surface of the keeper adjacent the camming surface being inclined at an angle relative to the direction of travel of the arm produced by swinging the swinging member for releasing the arm from the keeper upon forcibly swinging the swinging member, said base member being an elongated plate-like member of substantially uniform thickness throughout the length thereof and providing at one end thereof a hinge portion for connection to said coacting swinging member and providing between the opposite ends thereof said keeper and camming surface, and being curvedly bodily offset at one end of the camming surface relative to the general direction of the camming surface to provide said keeper.

5. In a device for hingedly and supportingly mounting a cover on an enclosure wall, a base member adapted for attachment to the enclosure wall and having a keeper support provided with a keeper at its upper end and a camming surface extending therefrom, a relatively swinging member adapted for attachment to the cover and carried by said base member, an arm pivotally connected to said swinging member for swinging movement toward the keeper and camming surface, and a spring means biasing said arm toward said keeper and camming surface, the biasing force of the spring against the arm being such that the arm and swinging member support the cover adapted for attachment to the swinging member in its open position with the arm in engagement with the keeper and applying increasing resistance to the closing movement thereof as the arm travels along said camming surface away from the keeper, said camming surface being disposed relative to the path of movement of said arm to increase the bias of the spring as the arm moves along said camming surface away from the keeper, said keeper support and arm being provided with coacting stops limiting the swinging movement of the swinging member, the stop of the keeper support being disposed above the keeper.

6. A cover support and check for a cover member hingedly connected to an enclosure wall member comprising a keeper support adapted for connection to one of said members and provided with a keeper and a camming surface extending therefrom, an arm supporting member adapted for attachment to the other of said members, an arm swingably connected to said arm supporting member, said keeper support and arm supporting member being relatively movable between a cover closed position and a cover open position, the arm being disposed between the arm supporting member and keeper support to releasably engage said keeper in the cover open position and to engage said camming surface between the cover open and closed positions upon relative movement between the arm supporting member and keeper support, and a spring means biasing said arm relative to said arm supporting member and towards the keeper and the camming surface, said camming surface and arm being relatively disposed to increase the bias of the spring as the camming surface and arm engagingly move relative to each other in order to increase the resistance to the closing movement, the surface of said keeper adjacent said camming surface being inclined to the direction of relative movement of the keeper support and arm between cover open and closed positions for releasing the arm from the keeper upon forcible relative movement between the arm supporting member and keeper support, said keeper support being a plate-like member of substantially uniform thickness and providing said keeper and camming surface, and being curvedly bodily offset at one end of said camming surface relative to the general direction of the camming surface to provide said keeper.

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