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BEEHIVE HAVING A SLIDABLE BROOD FRAME ASSEMBLY

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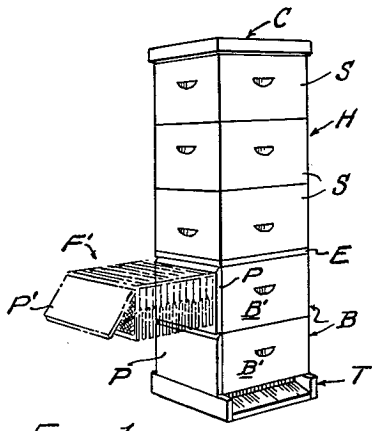


FIG-1

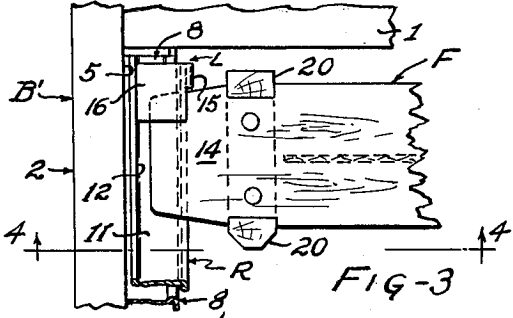


FIG-3

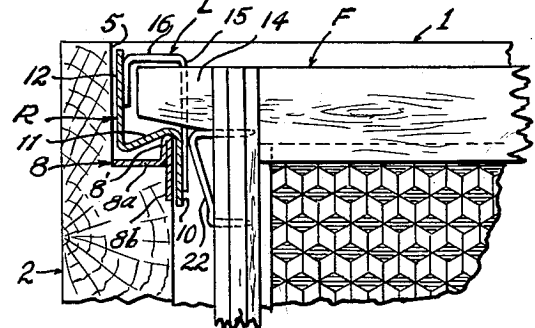


FIG-4

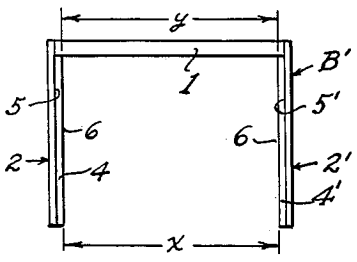


FIG-2

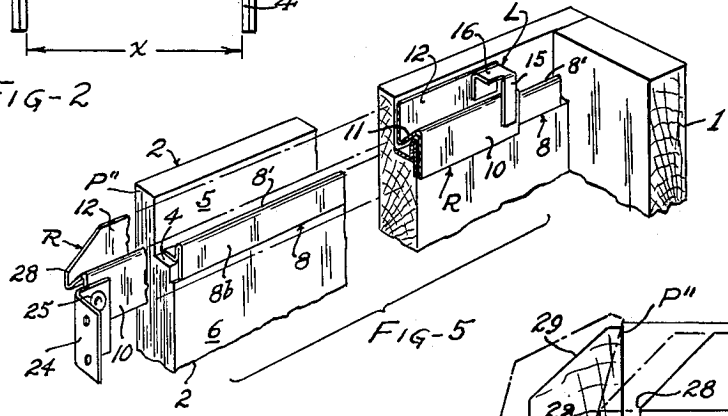


FIG-5

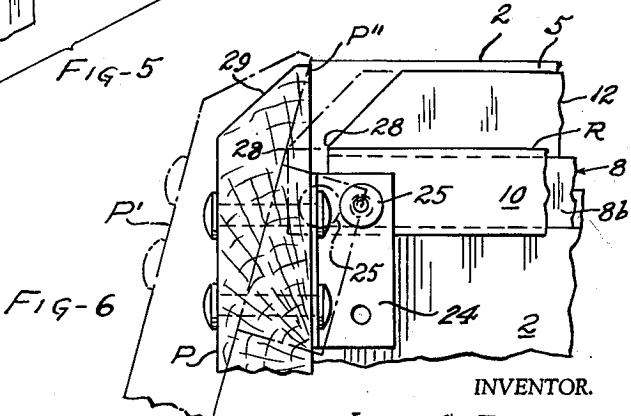


FIG-6

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BEEHIVE HAVING A SLIDABLE BROOD FRAME ASSEMBLY

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This invention relates to an improved brood chamber unit (body and brood frame assembly) for use in presently standard beehives or hive assemblies such as usually comprise, principally, a bottom board; hive stand; one or two brood chamber units; one or more supers or honey storage units, and a hive cover or cover assembly.

Commercial beehives or hive assemblies throughout large portions of the world presently have standard proportions measured horizontally, brood rearing being accomplished in single or double brood chambers (tiered identical hive body units if two are used) surmounted by as many supers or honey storage units as necessary for accommodating expected honey production or crop in the areas, seasons and colony conditions involved. Efficient, i.e., reasonably highly productive, beekeeping requires close attention to the brood portions of the colony, for sanitation, swarming indications etc., and, since the colony will accept for brood rearing only the lower regions of the hive assembly, appropriate periodic attention to the brood regions presently requires laborious and hazardous lifting off and replacement of the cover assemblies. The present invention greatly reduces such labor and hazards, thus indicating the general object thereof.

The herewith-illustrated embodiment of the present invention comprises replacement of standard brood-body unit assemblies (upwardly and downwardly open rectangular bodies with frame rests, called rabbets, and extractor-type frames supported as usual on the frame rests) by three sided generally rectangular body units having horizontal proportions approximately identical with those of the standard body units, and provision enabling support of a complete complement or set of standard extractor-type brood frames in the brood chamber body and easily removable from and replaceable into the body through its open front portion provided by such brood-chamber-defining three sides.

The invention provides a rigid and complete front closure panel for the three-sided brood body, so connected to comb-frame-supporting rails or runners slidable on standard "rabbet" flanges or ribs upon which, in conventional hive constructions, the usual top bar extensions or shoulders of the frame top bars would rest. The rigid closure panel is pivotally connected to the rails or runners in a manner to enable the panel to be used initially as a lever against forwardly exposed surfaces of the approximately parallel sides of the body, serving as fulcrum points, to facilitate breaking loose of any of the frames that the bees may have attached to the body by propolis or bee glue; and, subsequently, as a manipulator for the rail and frame unit assembly to facilitate withdrawing of the same from normal position in the hive and replacing it therein.

Objects and advantageous features of the invention not indicated above will become apparent from the following description of the presently preferred embodiment as shown in the accompanying drawing, wherein:

FIG. 1 is a perspective view of a hive or hive stand H including the present subject brood chamber units B (two being shown by way of example).

FIG. 2 is a small scale plan view of the three sided, brood chamber body B' as earlier above outlined.

FIG. 3 is a fragmentary full scale top or plan view of

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a corner portion of the body B' and an associated portion of a more or less standard frame F having self-spacing end bars.

FIG. 4 is a fragmentary sectional view taken as indicated by the line 4—4 on FIG. 3 showing typical comb foundation and a shoulder portion of the frame top bar resting on a rail or runner R hereof.

FIG. 5 is a fragmentary perspective view principally showing further details of the rail or runner R and its relationship to a standard or conventional frame rest member 8 commonly called a "metal rabbet."

FIG. 6 is a fragmentary transverse sectional view of a forward (left hand) corner portion of the unit B and front closure panel P thereof in closed position (full lines), the panel being indicated in open or opening position by broken lines.

The hive stand assembly H, as shown in FIG. 1, has, in addition to the already identified brood chamber units B hereof, a conventional bottom support and bee-entrance assembly T; queen-excluder E; supers S, and cover assembly C. As has been indicated above, the term front, as used in this specification (with correlative terms) means the leftwardly exposed portions of the hive stand as shown in FIG. 1.

The brood chamber units B are substantially identical, and, as shown for example in FIG. 2, each of the bodies B' includes a wooden back 1 and two nearly parallel wooden sides 2 and 2' conventionally or suitably joined as by dovetail constructions not shown. The sides diverge forwardly at a suitably small angle (dimension x, FIG. 2, being greater than dimension y)—usually in the magnitude of one sixteenth of an inch—to facilitate forward movement of the frames F after they have been broken loose.

The sides 2 and 2' or at least their free end forward portions are suitably treated or sealed to exclude moisture and prevent warping. The preferred treatment is such as will also minimize or discourage the tendency on part of the bees to coat the inner surfaces of the body B with propolis or bee glue. The preferred treatment is with silicone type coating which serves both purposes mentioned. The metal parts are also similarly or suitably coated to discourage deposition of propolis thereon by the bees. The front closure panel P is similarly sealed-treated, particularly to minimize warping.

The inner upper marginal portions of the sides 2 and 2' are conventionally rabbet-cut or formed, providing depressed horizontal ledges 4 and 4' as usual in beehive body constructions, having approximately vertical wall surfaces 5 and 5' FIG. 2 or as indicated at 5 in FIGS. 3 through 6. The inner surface portions 6 of the sides 2 and 2' are extended as ribs upwardly beyond the ledges 4 by the conventional metal rabbets 8, providing slidably guiding supports for the rails or runners R as is believed to be self evident from the drawing.

The upright flange or rib portions 8' of the metal rabbets 8 (see FIG. 4) are formed by folding metal strips which constitute the "rabbets," and by bending the marginal or flange portion 8a and 8b of the strips at right angles to each other for attachment as by nails (not shown) to the sides 2 and 2'. The exposed surfaces of the vertical flanges 8b are preferably flush with the surface portions 6 of the sides 2 and 2' as shown in FIG. 5. The construction just described provides two upwardly open channels or troughs of uniform cross section above the respective ledges 4 and 4' for substantially the full depth, horizontally, of each of the broad chambers of the body units B'.

The metal rails or runners R hereof are preferably of uniform Z-shaped cross section, having, as shown, vertical flanges 10 for loose guidance by associated vertical body surfaces provided as by the sides 2 and 2', and metal

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rabbit flanges 8b; web portions 11 which slope downwardly and outwardly from the tops of the ribs 8', and upright flanges 12 loosely adjacent the upright rabbit-cut inner marginal surface portions 5 of the sides 2 and 2'. The acute angle formed by the upright flange portions 10 with the inclined webs 11 of the rails or runners provides narrow (bee-glue-area-minimizing) rests for conventional horizontally projecting end portions 14 of the top bars of the frames F as will be evident from inspection of FIG. 4. The upright flange portions 12 of the rails or runners lie somewhat loosely adjacent the associated vertical wall surfaces 5 and 5' of the rabbit formations on the sides 2 and 2' and provide barriers to prevent the bees from gluing the outer ends or shoulders of the top bars of the frames F to the sides 2 and 2' of the body B'. Such gluing would otherwise make it very difficult to move the frames F outwardly or forwardly with the rails or runners R.

The rearward end portions of the rails or runners R are provided with lugs L, rigid therewith, to abut the top bars or shoulders of the rearmost frame F and to enable drawing of that frame, hence the other frames, forwardly with the rails or runners R.

The lugs L can be formed by sheet metal pieces of U-shape, spot-welded or otherwise secured rigidly to the rails or runners. As shown, vertical portions 15 of the lugs abut the frame end portions 14. Horizontal portions 16 of the lugs L overlie the frame top bar end portions or shoulders 14 so that, if or when the rearmost frame F, i.e., the principal plane thereof, becomes inclined toward horizontal position while drawing the frames out of the body B' the end portions 14 cannot slide over the abutments provided by the frame abutment portions 15 of the lugs L. As shown, the upright portions of the lugs L are adapted to be secured to both associated or adjacent upright flange portions 10 and 12 of the rails or runners R, so that the lugs are strongly rigid and unitary with the rails or runners.

As previously mentioned, the sides 2 and 2' of the body B', FIG. 2, diverge slightly forwardly. Thereby any accumulations of propolis or bee glue by which the bees tend to attach any available portions of the end bars 20 of the frames F to the sides 2 and 2' of body B' will be successively cleared or passed by freely; and the frames, thereby, will not be subjected to drag such as would have occurred had the sides 2 and 2' been formed or disposed substantially in parallel relationship to each other as (intentionally at least) are the corresponding sides of conventional brood or super bodies.

The frames F can be generally aligned with each other fore and aft, by the use of staple-type end spacer devices 22, FIG. 4, in the end frame bars 20 or by extending the overhanging end or shoulder portions 14 of the top bars so as to lie close to the upright barrier flanges 12 of the rails or runners R. If transverse alignment of the frames is effected by extending the top bars as just mentioned the frames F would not be difficult to remove vertically; and, of course, any attachment of the projecting end portions 14 by the bees to the rail or runner flanges 12 would not obstruct free movement of the frames out of the body B' with the rails or runners.

For enabling effectual operation in breaking loose of the frame and rail or runner assembly (represented at F' diagrammatically in FIG. 1), as by forward prying operation on the front panel P with a bee knife and subsequent manipulation of the panel P as a lever, the panel P is hinged to the rails or runners as by hinge brackets shown as angle members 24 (via attaching rivets 25, one shown) forming loose pintles or axles having substantially common axes transverse to the direction of sliding movement of the assembly F'. The pivot axis is located below the principal horizontal plane of the top edge portions of the sides 2 and 2', and the sides extend forwardly so that the forward edge surfaces thereof are normally abutted horizontally by the closure panel P in its full-line-illus-

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trated or closed position in FIG. 6. Thus when the panel P has been pried loose and has then been swung outwardly, as into the broken-line-illustrated position P', FIG. 6, forward edge surface regions, as at P'', of the sides of the body B' constitute fulcrums. Thereby the panel P serves as a lever so that forward swinging motion of it will break loose any attachment, via propolis, of the various frames F in the body B'. FIG. 1 illustrates diagrammatically the manner in which a frame and runner assembly F' can be withdrawn from the hive so as to facilitate periodic inspection of the brood chambers either by the beekeepers or by government-authorized inspectors. Rearrangement or redistribution of the frames F in the chambers or from chamber to chamber becomes necessary or desirable at times in order for example to disturb the swarming pattern of the bees in the colony, thereby to prevent or postpone swarming.

The forward swinging motion of the panel P, FIG. 6, is limited by abutment of the panel with end corner portions 23 of the vertical flanges 12 of the rails or runners R. The top edge surface 29 of the closure panel P is preferably beveled as shown, so that, if the panel, in its normal or brood-chamber-enclosing position, underhangs a super S or another body B', the panel in being swung forwardly will not tend to disturb the position of such super or body.

The unit F' comprising the front panel P, rails or runners 10 and the frames does not tend to bind or stick in its support as a drawer in a bureau or cabinet often will. This is due to the fact that the pivotal connections at 25 and other cooperating parts of the above described construction require working clearances and the fact that the frames F are loosely held by gravity in position on the rails or runners R. Thus the rails or runners can be shifted (e.g., by manipulation of the panel P) individually forwardly and rearwardly short distances during the operation of sliding the units F' in and out. Successive weaving or see-saw motions horizontally may thereby be used to advantage in breaking the frames F loose from unusually heavy accumulations of propolis or bee glue.

Instead of placing the brood chamber units B with their closure panels P facing in a common direction (e.g., toward the "front" as in FIG. 1) it is recommended that, when two units B are required, the upper one can to advantage be placed in a 180° turned position relative to the lower unit B, presumably occupying the position of it illustrated in FIG. 1. In other words, two units B, without rendering the hive assembly H unstable or unbalanced, even in appearance, can be relatively staggered in a common vertical plane sufficiently so that the upper and lower edge surfaces of each closure panel will be exposed vertically and out of registration with associated portions of the hive assembly (e.g. of super units, bottom board units or other brood chamber units). Thereby the closure panels P can most easily be pressed firmly into closing positions without interfering with or disturbing any underlying or overlying surface portions of the hive assemblies.

I claim:

1. A brood chamber unit for use under conventional supers (or under units approximately identical therewith), and in combination with brood frames therein having top bars whose end portions project horizontally beyond their end bars, said unit comprising a three-sided approximately rectangular body open at the front, rabbit formations along the top edge portions of the approximately parallel sides of the unit and having upstanding ribs rigid therewith providing, in cooperation with the rabbit formations, upwardly open channels, rails or runners providing downwardly facing channels slidably guided by respective ribs, and providing rests for the horizontally projecting top bar end portions of the brood frames, a rigid rectangular panel removably closing the open side of the body and secured to the rails or runners, the rails or runners having means at their rearward ends arranged for

abutment with the rearmost brood frame to enable it to be pulled forwardly when the panel is moved forwardly.

2. The brood chamber unit according to claim 1 wherein the approximately parallel sides diverge forwardly.

3. The brood chamber unit according to claim 1 wherein the rails or runners are of Z-shaped cross section with parallel flanges continuously therealong to provide narrow rests for the horizontally projecting end portions of the frames and whereby the downwardly open channels thereof have downwardly diverging surfaces adjacent the associated ribs, the flanges of the rails or runners lying adjacent the approximately parallel side portions of the body serving as barriers to prevent contact between said horizontally projecting ends of the top bars and associated side surfaces of said body.

4. In a beehive, a brood chamber unit including a three-sided rigid body open at the front and generally enclosing an approximately rectangular brood space, and a plurality of standard or full depth frames in said space and having top bars whose end portions project horizontally beyond associated end bars, the three sides of the unit body being proportioned to underlie corresponding three sides of a conventional or standard rectangular honey storage super in approximate vertical alignment therewith continuously along three sides of such super, the two opposing ones of said three sides of said body being rabbet-cut or formed continuously along its top edge and respectively having upstanding metal flanges fixed therealong to form upwardly open channels in cooperation with associated rabbet-constituting surfaces, a pair of metal rails or runners providing downwardly open channels loosely embracing said upstanding flanges and in slidably guided contact therewith, the rails or runners providing on their top sides narrow supports for associated projecting end portions of the top bars of the frames, the rails or runners having respective lugs rigid therewith near their rear end portions disposed to abut associated upright surface portions of the top bar of the rearmost frame so as to be capable of moving that frame, hence the other frames, forwardly as a function of forward sliding move-

ment of the rails or runners, and a rigid closure panel removably blocking the open side of the three-sided body and being connected to the rails or runners in a manner to move the same, hence the frames through said open side when the panel is pulled forwardly.

5. The apparatus according to claim 4 wherein the lugs have rigid portions overhanging the projecting end portions of the rearmost frame to prevent such end portions from riding over the lugs in event resistance to movement on part of the rearmost frame causes that frame to be greatly inclined.

6. The apparatus according to claim 4 wherein the rails or runners are generally Z-shaped unitary strips of sheet metal of uniform width having approximately parallel flange portions and connecting webs, and the downwardly facing guide channels are constituted by the flange portions which lie adjacent the brood space in cooperation with the associated web portions of the strips.

7. The apparatus according to claim 4 wherein the front closure panel is pivotally connected along a common horizontal axis at regions adjacent its upper corners to forward end portions of the respective rails or runners.

8. The apparatus according to claim 7 wherein the common horizontal axis of the pivoted connections is disposed sufficiently below the top edges of the closure panel so that forwardly swinging movement of said panel enables it to operate as a lever against adjacent forwardly exposed surface regions of the sides which thereby provide fulcrums for the lever to enable breaking loose of any adhering frames.

References Cited in the file of this patent

UNITED STATES PATENTS

| | | |
|-----------|--------|---------------|
| 212,594 | Driver | Feb. 25, 1879 |
| 502,486 | Dewey | Aug. 1, 1893 |
| 945,650 | Webb | Jan. 4, 1910 |
| 2,217,222 | Hall | Oct. 8, 1940 |

FOREIGN PATENTS

| | | |
|---------|---------|--------------|
| 163,107 | Austria | May 25, 1949 |
|---------|---------|--------------|