June 6, 1944. J. E. BALES 2,350,487

HOPPER TYPE BIN

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FIG. 1.

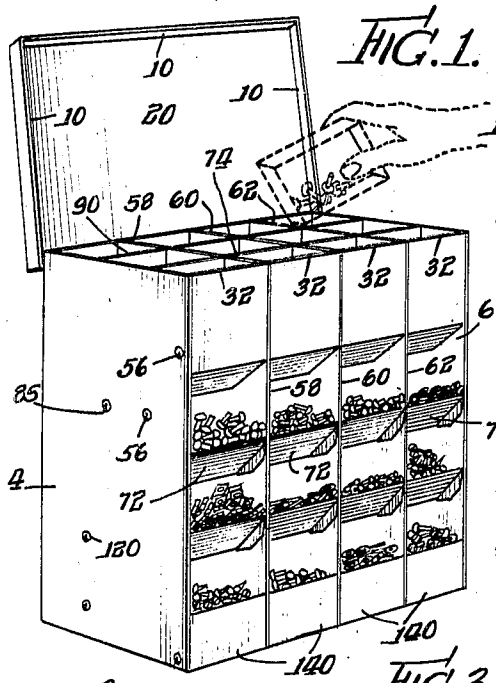


FIG. 2.

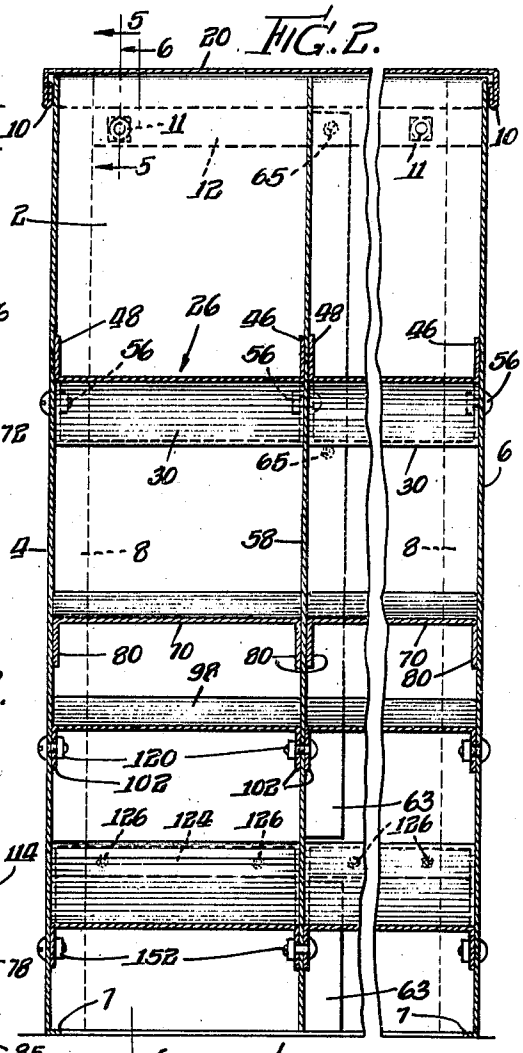


FIG. 3.

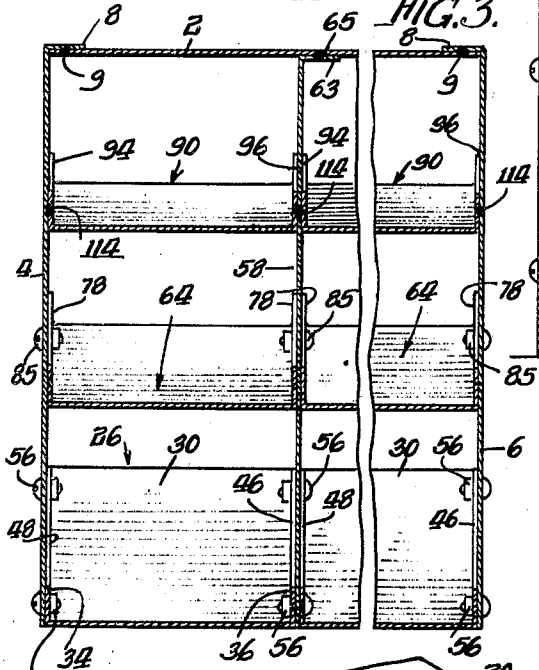


FIG. 4.

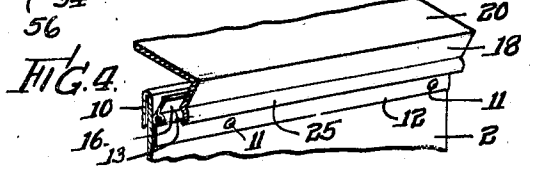
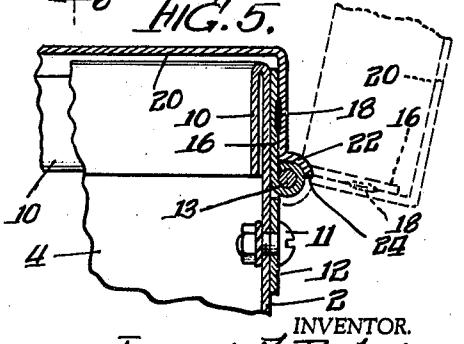


FIG. 5.



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HOPPER TYPE BIN

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FIG. 6.

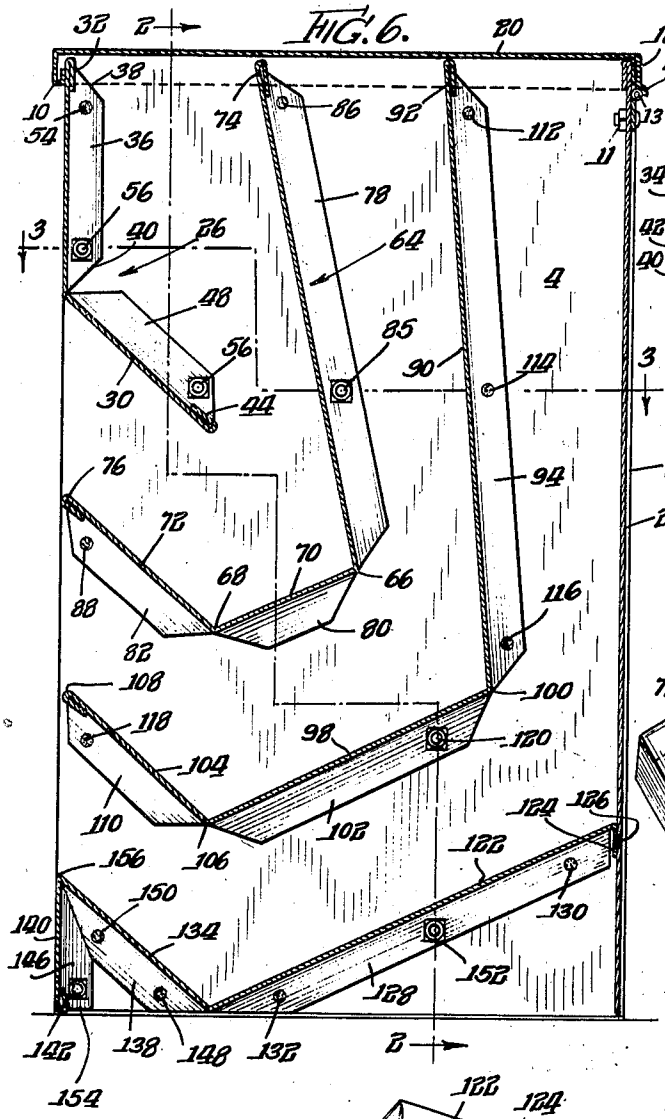


FIG. 7.

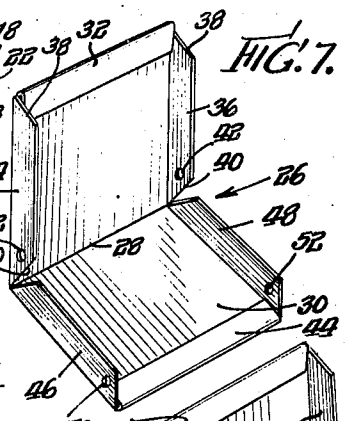


FIG. 8.

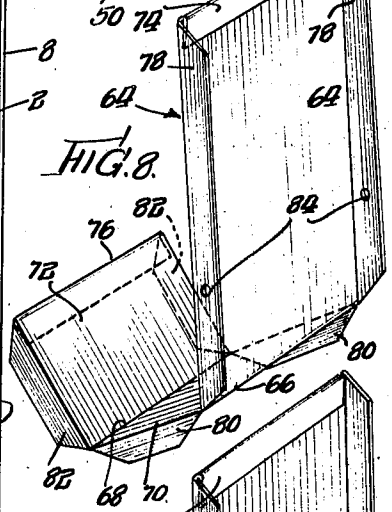


FIG. 9.

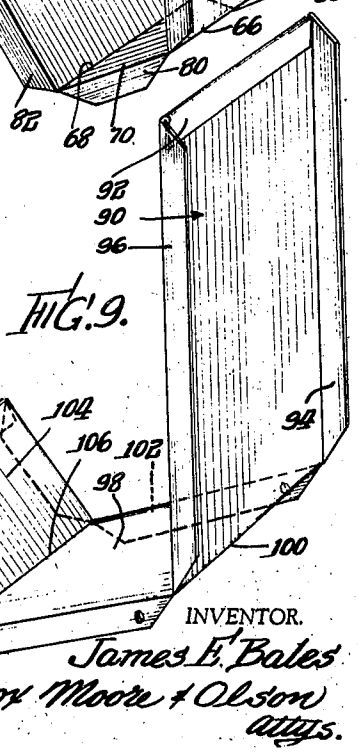
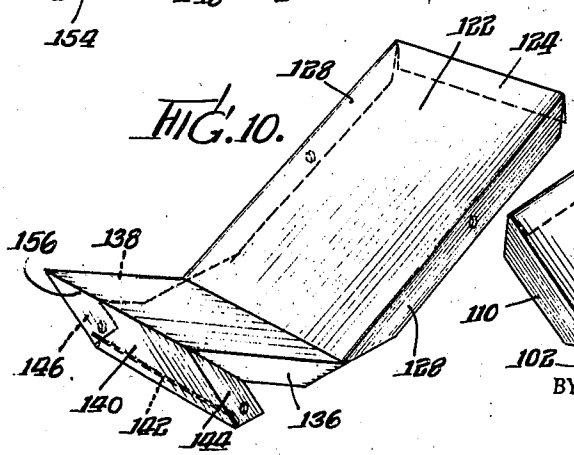


FIG. 10.



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attys.

Patented June 6, 1944 2,350,487

UNITED STATES PATENT OFFICE

2,350,487

HOPPER-TYPE BIN

James E. Bales, Aurora, Ill., assignor to Lyon Metal Products, Incorporated, Aurora, Ill., a corporation of Illinois

Application December 2, 1940, Serial No. 368,115

9 Claims. (Cl. 211—135)

This invention relates to sheet metal articles, and more particularly to a bin provided with convenient means for display, use or assembly.

Among the objects of the present invention is the provision of a bin of the foregoing character, wherein means is provided for facilitating the replenishment of the individual bins; to provide a device wherein the individual bins may be filled or replenished from the top of the bin, whereas the articles on display in each bin are observable and accessible from the side or front wall of the bin.

Yet another object of the invention resides in providing a replenishing means for a series of display bins, wherein the replenishment occurs so as to generally cause the articles that have been in the bin for some time, to be used before the replenished articles are used; in short, to provide a construction wherein the flow of replenishment of articles in each bin tends to move those articles lying in each bin forwardly, so that they can be withdrawn prior to the withdrawal of the replenishment articles; to provide a compact bin of the hopper type wherein all of the articles are simultaneously accessibly displayed from the front of the bin; and wherein all of the bins may be simultaneously and/or individually refilled from a remote portion of the bin, preferably the top.

These and other objects of the invention will be apparent from a perusal of the specification, when taken in connection with the accompanying drawings.

Figure 1 is a perspective view of the improved hopper bin.

Figure 2 is a vertical, cross-sectional view taken along the line 2—2 of Figure 6.

Figure 3 is a plan, sectional view taken along the line 3—3 of Figure 6.

Figure 4 is a fragmentary, perspective view of the upper rear portion, showing the hinge and cover.

Figure 5 is a fragmentary, cross-sectional view taken on the line 5—5 of Figure 2.

Figure 6 is a vertical, cross-sectional view taken on the line 6—6 of Figure 2.

Figure 7 shows a view of the front chute.

Figure 8 is a view of the second partitional chute.

Figure 9 is a view of the third partition formed in the chute; and

Figure 10 is a view of the bottom partition that forms the bottom tier of chutes.

Referring now to the drawings in detail, the bin preferablly takes the form of a general boxlike structure composed of a metal back 2 and two sides 4 and 6, which are bent at right angles to form flanges, and which are welded to the rear walls as at 9. In addition, there is a front hereinafter to be described, and a cover hinged to the back as shown more specifically in Figures 4 and 5. In this connection it will be seen that the back 2 extends upwardly at the top and is flanged inwardly as at 10 to provide a reinforcement. There is formed on the lower edges of the sides 4 and 6 a pair of inturned flanges 7, which help to form a more rigid side wall. To the rear of the upper edge of the back 2, fastened by means of bolts 11, is a strip 12, which extends across the back as shown in these figures. The upper edge of this strip is curled back to provide a bearing for the hinge pin 13. The other portion of the hinge is formed by a strip 16 that is welded to the inner face of a flange 18 of the cover 20.

In addition, the rear flange 18 of the cover is provided with an arcuate portion 22 which forms a cover portion for the upper portion of the hinge, and also provides a shoulder 24, which, in cooperation with the upper edge of the strip 12, forms a stop to limit the backward swing of the cover, as shown in dotted lines. The flange 10 of the cover extends along the two sides and along the front of the cover 20.

The boxlike structure formed of a back and the two sides is provided with a plurality of external, spaced apart partitions, which not only form a series of separate bins, but also provide a front for the boxlike structure, and provide, as well, a relatively large opening at which all of the individual bins open, so that the contents thereof are readily accessible and observable from the front of the boxlike structure, and, in addition, are fillable from the top of the boxlike structure. In short, a honeycomb series of display or sales bins is provided, which open on the front of the boxlike structure, while at the same time a honeycomb series of filler openings is provided at the top face of the boxlike structure, each filler opening communicating with its own individual bin, so that the individual bins are accessible from the front face of the boxlike structure, and may be filled or refilled from an individual filler opening at the top of the boxlike structure when the cover has been opened.

Referring particularly to Figures 6 to 10, inclusive, there is provided a front chute partition, shown in perspective in Figure 7, which comprises a flat sheet metal stamping 26 imbedded at 28, and provided with a chute section 30. The upper edge of this section is flanged over as at 32 for reinforcement and finish, and

the two sides are flanged as at 34 and 36. The same are preferably provided with beveled edges as at 38 and 40 and are apertured as at 42. In addition, the chute section 30 is flanged on the inside face inwardly and upwardly as at 44 for strength, and are provided with side flanges 46 and 48, which latter are apertured as at 50 and 52.

This front chute portion is affixed in position between the side walls 4 and 6 in the manner illustrated in Figure 6, being welded at the top of each of the flanges 34 and 36, as shown at 54, and being held in position by means of bolts, rivets, or self-tapping screws at 56, which bolts and self-tapping screws pass through the openings 42, 50, and 52. The upper flange 32 of the chute piece 26 thus forms a front edge section of the bin proper. By reference to Figures 1 and 7, it will be appreciated that there is a plurality of these front chute pieces; in Figure 1 there are four. They extend horizontally across the boxlike structure and are divided by a plurality of sheet metal partitions 58, 60, and 62, which are formed with a flange 63 on their rear edges, and which, in turn, is welded to the rear wall 2 as at 65. In short, the first front chute section will be welded and bolted to the end piece 4 and to the partition 58. The second front chute section will be welded and bolted to the two adjacent partitions 58 and 60, and so on across the boxlike structure. It will thus be seen that the outer face of the section 26 provides a series of vertical front walls for the completed bin, and that the chute section 30 provides an internal, rearwardly and downwardly inclined chute for directing articles into the upper series of chutes, as hereinafter described.

In the same manner the next or second chute portion is formed, as shown in Figures 6 and 8. This comprises a plurality of relatively long and narrow sheet metal blanks or stampings 64 bent as at 66, and also as at 68, to provide an intermediate flat section 70 and a front section 72. The top of the section 64 is flanged over for strength and finish as at 74, and the opposite end of the section 72 is flanged over for strength and finish as at 76; and each section 64, 70, and 72 is provided with a pair of parallel lateral flanges 78, 80, and 82, respectively, and these flanges are formed with registering pairs of openings 84, through which bolts or self-tapping screws 85 pass through the flanges 78 and into the end piece 4 or the adjacent partitions 58, depending upon which one of these chute pieces is being considered. The top and bottom flange portion 78 and 82 are welded to the adjacent side wall portions or partition portions as at 86 and 88, respectively.

The third chute portion, shown in Figure 9, also comprises a section or blank somewhat of the general shape of the second mentioned blank shown in Figure 8, but is relatively longer. This section is shown in Figure 9 and comprises a first section 90 flanged at 92 at its top, and is provided with side flanges 94 and 96. There is an integrally formed second section 98, which is bent at an angle from the first section 90 as at 100, and this section is provided with parallel side flanges 102. A third or front section 104 is bent angularly at 106, and is provided with a front end 108 flanged over on itself for strength, finish and rigidity, and is provided with side flanges 110. This chute section is welded as at 112, 114, 116, and 118, and is bolted or screwed as at 120 into the side vertical partitions, or to the end partitions 4 and 6, as the case may be.

In addition, there is a bottom chute section formed as shown in Figure 10 comprising a first section 122 flanged as at 124, and which flange is welded as at 126 to the rear wall 2. This section is provided with side flanges 128, which are welded as at 130 and 132 to the vertical side walls 4, 58, 60, and 62, or to the side wall 6, as the case may be. Also, this bottom section is, likewise, provided with an additional front section 134 and two side flanges 136 and 138, and is provided with an additional or front vertical section 140, which is flanged rearwardly and reentrantly as at 142 and with two lateral side flanges 144 and 146. This bottom chute section is, likewise, welded at 148 and 150 to the side walls, hereinbefore described, and is bolted or secured by self-tapping screws as at 152 and 154 to the hereinbefore mentioned vertical partition or side walls of the cabinet or boxlike structure hereinbefore described.

The front section 140 provides a series of horizontally disposed, adjacent lower front walls for the boxlike structure of the bin between the interposed end walls 4 and 6 and the intervening adjacent, spaced apart, vertical partitions 58 to 62, inclusive. It will be noted that between the front portions 26 and 140 there is provided a series of rectangular openings formed by the front edges 76 and 108 and the bent edge 156 of a lowermost chute section, which edges and bent portions lie in the front plane of the chute portions 26 and 140, thereby providing a front face for the bin arranged in honeycomb fashion.

It will also be noticed that by reason of the arrangement of the chute portions 26, 64 and 90 and the intervening partitions 58, 60, and 62, in cooperation with the side walls 4 and 6, the top is likewise provided in honeycomb fashion with a series of boxlike openings, and each one of these boxlike openings acts as a filling mouth for its own particular chute, since the arrangement of the partition members 58 to 62 and these chute sections provide a series of continuous compartments, each one of which opens at the top and opens on the front face of the boxlike bin or cabinet, so that, when material is dumped into a particular filling opening, as shown in dotted lines in Figure 1, the contents thereof will descend by gravity, and will be directed by the partition members shown in Figures 6 to 10, inclusive, to a particular bin.

It will be noted that the partition members shown in Figures 8, 9, and 10 are shaped so as to provide a series of horizontally disposed troughs or bins having oppositely inclined walls separated by the end walls and the vertical partitions 58 to 62, inclusive, by which arrangement the contents of each hopper is readily accessible and viewable from the front of the boxlike structure. By this arrangement a compact, rigid display or sales assembly, hopperlike bin is provided having a series of individual hoppers or bins, each of which can receive and hold a different type of assembly, if desired, and in a manner such that each bin may be readily refilled or replenished from the top of the boxlike structure without otherwise disturbing the contents of the bin, and in such a manner that during the act of refilling each bin, the material as it flows in will tend to push forwardly the contents already there.

Changes may be made in the form, construction, and arrangement of the several parts without departing from the spirit of the invention or sacrificing any of its numerous advantages, and

the right is hereby reserved to make all such changes as fairly fall within the scope of the following claims.

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

1. Boxlike casing having open top and open front, a series of vertical parallel partitions disposed in spaced relation therein, a series of sheet metal members, each comprising a vertical wall and a rearwardly, downwardly inclined wall, each member being mounted at the top of the front of the casing between adjacent partitions so that each such vertical wall forms an upper vertical portion of a front wall of the casing and the rearwardly, downwardly inclined wall forms a commodity deflection, a second series of sheet metal members, each such member comprising a relatively long dividing wall member mounted between adjacent vertical partitions to the rear of and spaced from the corresponding front member, said relatively long dividing wall member extending vertically but slightly inclined downwardly and rearwardly from top to bottom, the bottom portion thereof being bent forwardly yet slightly downwardly and then forwardly and slightly upwardly to form a substantially V-shaped trough with the forward edge thereof fixed substantially at the front open edge of the casing, and a second series of partition members disposed to the rear of and in spaced relation from said first mentioned series of members, the upper portions of said last named members being spaced from the vertical rear wall of the casing and the bottom portions of said last named members being bent forwardly and downwardly and upwardly in spaced parallelism with the corresponding portions of said first mentioned series of members and a third partition member.

2. In a device of the class described in combination with an upper or vertical side wall and a vertical back wall, a series of interposed partitions formed of sheet material and providing a tier of vertically spaced hoppers between said vertical side walls, each hopper opening at the top of the boxlike structure to provide a filler opening and opening at the front of the boxlike structure to provide a display and accessibility opening, certain of said partition members being bent downwardly and forwardly and upwardly and forwardly to provide a hopperlike portion, and certain of said partition members having sections disposed in the front plane of the vertical side portions to provide spaced apart upper and lower front walls for the structure with intervening spaced apart openings, there being an opening at the front of the structure for each hopper, whereby the contents of the hopper may be observed, and whereby the contents thereof may be removed from each hopper.

3. In a device of the class described in combination with a vertical sheet metal back and a pair of vertical sheet metal side walls, a bottom trough formed of sheet metal comprising a relatively flat section having a rear flange secured to the inner bottom portion of the vertical back wall having flange portions secured to the bottom portion of the side walls, said flat portion being inclined from said rear wall forwardly and downwardly to substantially the bottom edge of said side walls, and then upwardly to the front edge of said side walls, and then being bent downwardly in the plane of the front edge of said side walls to the bottom edge of said side walls, whereby to form a bottom hopper between said side walls and a plurality of additional sheet metal partitions, each comprising a relatively long section extending in spaced relation from the top edge of said side walls downwardly and in slightly inclined direction in spaced relation between said vertical side walls and spaced from the rear wall, the bottom portion of said downwardly extending section being then bent forwardly and downwardly toward the front of said side walls, and then upwardly and substantially to the front edge of said side walls to provide additional vertically superimposed hoppers and an additional hopper section comprising a vertical sheet metal blank disposed substantially in the plane of the front edge of the side walls with its top disposed at the top edge of said walls, said last mentioned section having an inwardly and downwardly bent section integral therewith to provide a chute, and means for fixing said section in position, and a top hinged to the rear wall and adapted to overlie the top edges of said partition members.

4. A device as described in claim 3, further characterized in that the partition members described are disposed between a plurality of other partitions extending vertically in spaced relation from each other and between and from the two side walls of the structure, whereby to provide a series of horizontally extending and vertically extending hoppers of the character described.

5. In a device of the class described in combination with a boxlike structure comprising side walls and a back wall, said back wall including a first hinge portion along its upper edge, a top for said structure comprising a rear flange, a second hinge portion affixed to the inner side of said flange, said flange having on its lower edge an arcuate skirt adapted to overlie the hinge portions when assembled, the lower edge of said flange cooperating with the second hinge portion to provide a stop to limit the outward swing of the top.

6. A display and supply cabinet comprising a boxlike housing having upstanding side and rear walls, access to the interior being provided at the top, upstanding partition means generally parallel with the rear wall providing vertically extending compartments opening at their upper extremities adjacent the top of said housing, said partition means providing a forwardly and downwardly extending section adjacent the lower extremity thereof merging at its margin with a forwardly and upwardly extending section terminating in a free marginal extremity providing a bin or trough of substantial depth, said forwardly extending section of said partition means being arranged in vertically spaced relation to a member including a forwardly and downwardly extending section merging at its forward margin with a forwardly and upwardly extending section, terminating in a free marginal extremity providing another bin or trough of substantial depth, said member being located adjacent the bottom of the housing and forming a bin for a compartment located at the rear of said housing, said partition means having said merging margin disposed above and rearwardly of the forward free marginal extremity of the member immediately therebelow, and said cabinet having a front upper wall portion extending downwardly to a point spaced above the forward free marginal extremity of the partition means next therebelow.

7. A display and supply cabinet comprising a boxlike housing having upstanding side and rear

walls, access to the interior being provided at the top, upstanding partition means generally parallel with the rear wall providing vertically extending compartments opening at their upper extremities adjacent the top of said housing, said partition means providing a forwardly and downwardly extending section adjacent the lower extremity thereof merging at its margin with a forwardly and upwardly extending section terminating in a free marginal extremity providing a bin or trough of substantial depth, said forwardly extending section of said partition means being arranged in vertically spaced relation to a member including a forwardly and downwardly extending section merging at its forward margin with a forwardly and upwardly extending section, terminating in a free marginal extremity providing another bin or trough of substantial depth, said member being located adjacent the bottom of the housing and forming a bin for a compartment located at the rear of said housing, said partition means having said merging margin disposed above and rearwardly of the forward free marginal extremity of the member immediately therebelow, said cabinet having a front upper wall portion extending downwardly to a point spaced above the forward free marginal extremity of the partition means next therebelow, and said front upper wall portion having its lower margin offset rearwardly and upwardly from the forward free marginal extremity of the partition means therebelow.

8. A display and supply cabinet comprising a boxlike housing having upstanding side and rear walls, access to the interior being provided at the top, upstanding partition means generally parallel with the rear wall providing vertically extending compartments opening at their upper extremities adjacent the top of said housing, said partition means providing a forwardly and downwardly extending section adjacent the lower extremity thereof merging at its margin with a forwardly and upwardly extending section terminating in a free marginal extremity providing a bin or trough of substantial depth, said forwardly extending section of said partition means being arranged in vertically spaced relation to a member including a forwardly and downwardly extending section merging at its forward margin with a forwardly and upwardly extending section, terminating in a free marginal extremity providing another bin or trough of substantial depth, said member being located adjacent the bottom of the housing and forming a bin for a compartment located at the rear of said housing, said partition means having said merging margin disposed above and rearwardly of the forward free marginal extremity of the member immediately therebelow, said cabinet having a front upper wall portion extending downwardly to a point spaced above the forward free marginal extremity of the partition means next therebelow, the merging margin of said partition means being disposed at a point which, together with a corresponding point on the forward free marginal extremity of the member, forming the next lower bin, makes a substantial acute angle with the horizontal less than thirty degrees.

9. A display and supply cabinet comprising a boxlike housing having upstanding side and rear walls, access to the interior being provided at the top, upstanding partition means generally parallel with the rear wall providing vertically extending compartments opening at their upper extremities adjacent the top of said housing, said partition means providing a forwardly and downwardly extending section adjacent the lower extremity thereof merging at its margin with a forwardly and upwardly extending section terminating in a free marginal extremity providing a bin or trough of substantial depth, said forwardly extending section of said partition means being arranged in vertically spaced relation to a member including a forwardly and downwardly extending section merging at its forward margin with a forwardly and upwardly extending section, terminating in a free marginal extremity providing another bin or trough of substantial depth, said member being located adjacent the bottom of the housing and forming a bin for a compartment located at the rear of said housing, said partition means having said merging margin disposed above and rearwardly of the forward free marginal extremity of the member immediately therebelow, said cabinet having a front upper wall portion extending downwardly and having its extreme lower marginal portion disposed above and rearwardly of the forward free marginal extremity of the partition next therebelow and said merging margin of the partition means and the extreme lower margin of the front wall being disposed in substantially vertical alignment.

JAMES E. BALES.