United States Patent

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[54] **DIAMOND DRILL CORE TRAYS**
5 Claims, 14 Drawing Figs.

[52] **U.S. Cl.** **220/22,** 206/65, 206/72, 220/23.4
[51] **Int. Cl.** **B65d 25/04,** B65d 25/10, B65d 1/36
[50] **Field of Search** 220/20, 22, 23.4; 206/65, 72

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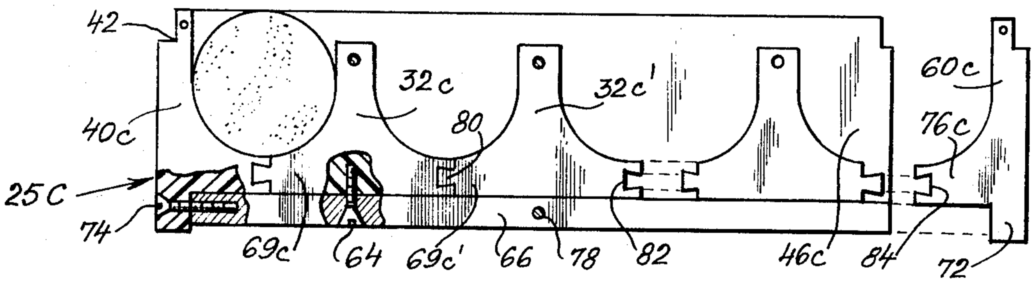
ABSTRACT: Trays adapted for supporting cylindrical mineral earth cores have cylindrically curved compartments with parallel flutes to support the cores laterally and underneath. Trays are made partially or entirely of plastic material. They may be made in different colors. Trays can be made of individual rails interlocked with each other and with an underlying baseboard. Covers fit snugly on trays which have rabbeted sidewalls.



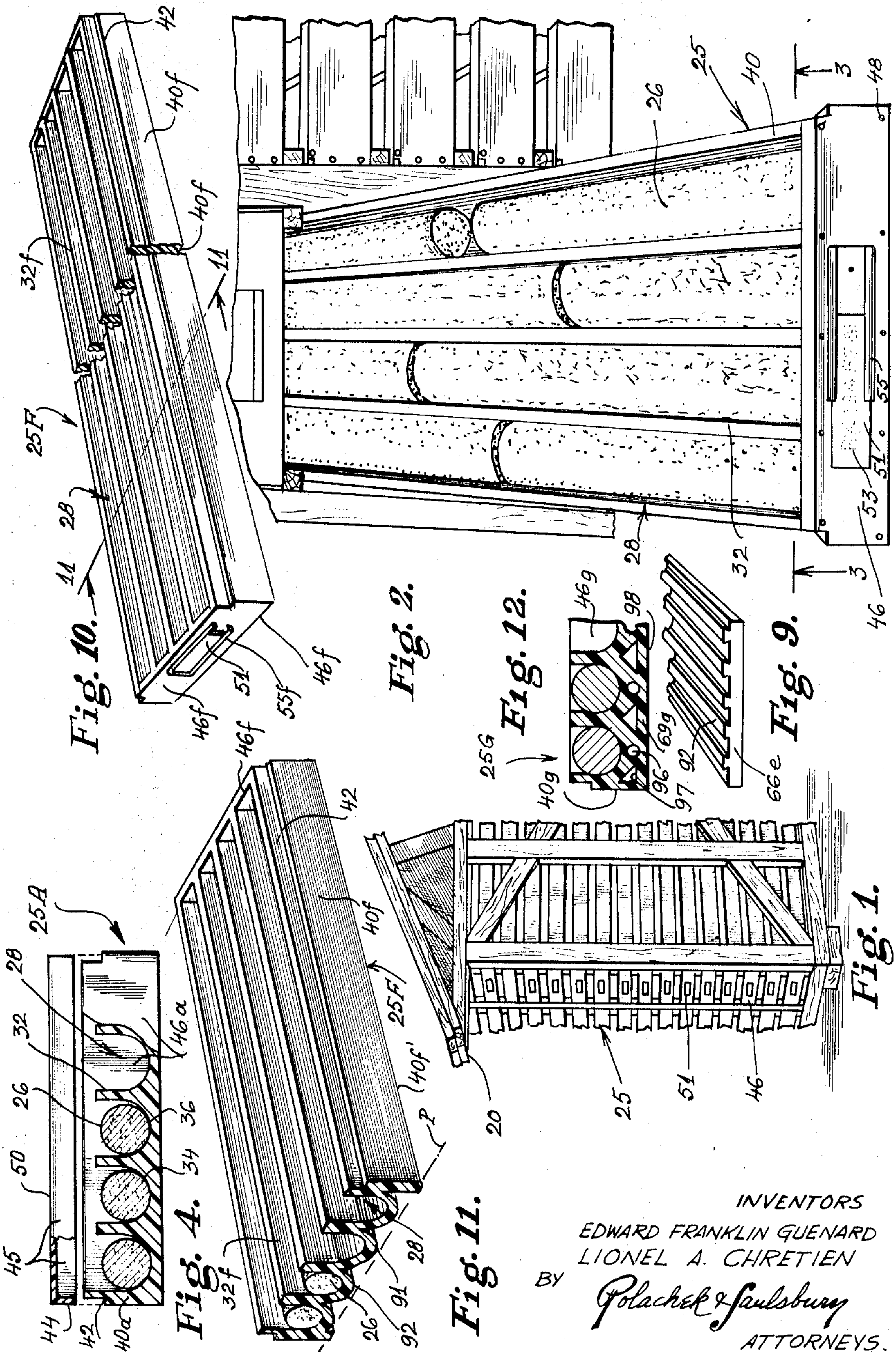


Fig. 10.

Fig. 2.

Fig. 12.

Fig. 9.

Fig. 1.

Fig. 4.

Fig. 11.

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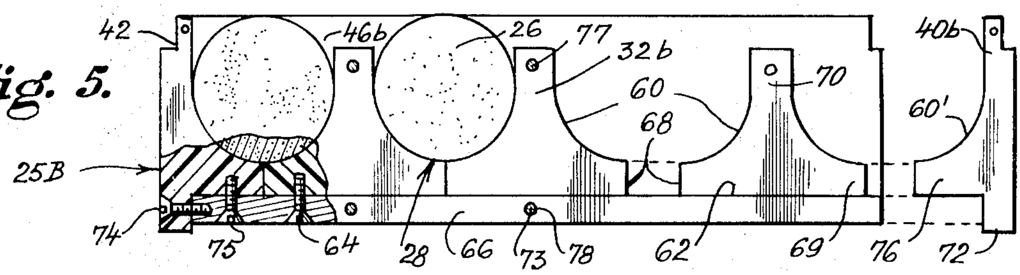

Fig. 5.

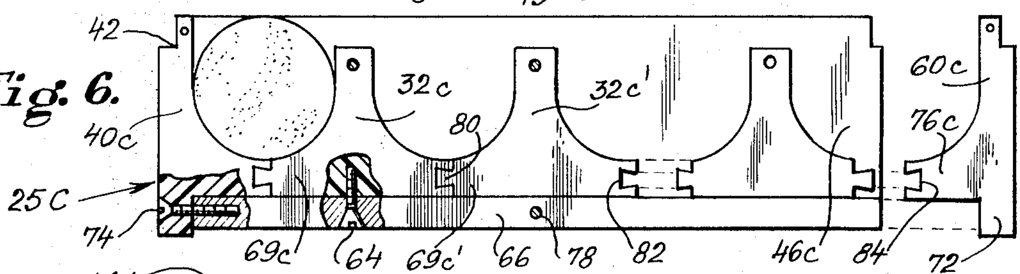

Fig. 6.

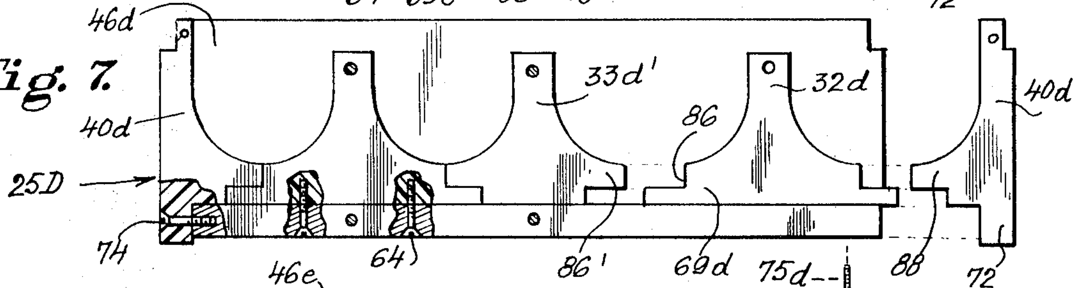

Fig. 7.

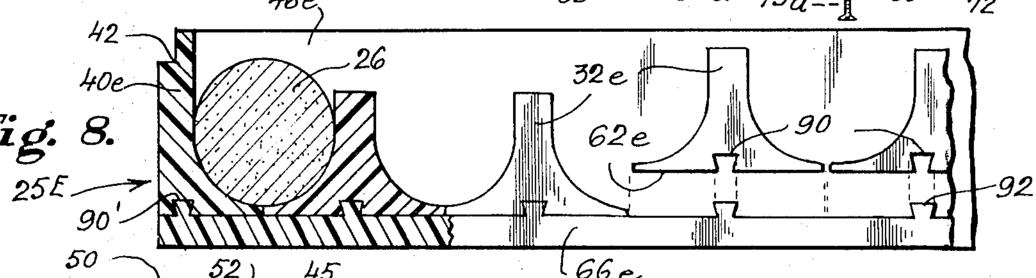

Fig. 8.

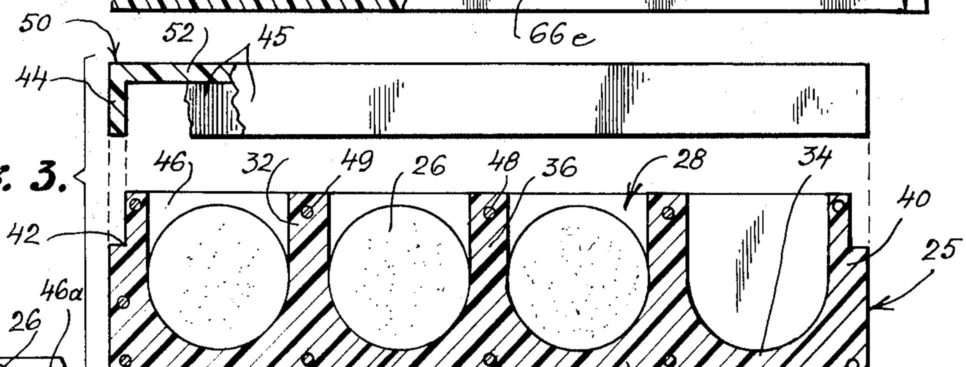

Fig. 3.

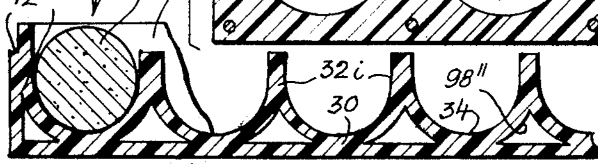

Fig. 14.

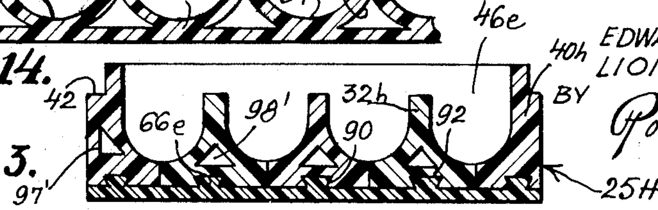

Fig. 13.

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DIAMOND DRILL CORE TRAYS

This invention concerns trays or boxes used for storing, classifying and shipping mineral earth cores. These are of particular utility in the mining industry, in mineralogical explorations, and the like. Heretofore trays used for storing and shipping mineral earth cores have been flat, rectangular wooden boxes with spaced slats defining open top compartments in which the fragile cores are placed. The compartments are rectangular in cross section and the cores are cylindrical. The cores fit loosely. As a result the cores frequently break up into small fragments when the trays are shipped. This is very objectionable. Furthermore the wooden loaded or unloaded trays frequently break when handled and while in shipment. The cores also break up. The present invention is directed at overcoming the above and other difficulties and disadvantages by providing trays or boxes for mineral earth cores of improved structure.

According to the invention a strong, lightweight tray is provided which can be made of plastic material and can be produced on known types of plastic working machinery by injection molding, extrusion, vacuum forming, pressing, casting and the like. The tray has a plurality of flutes, defining compartments with cylindrical bottoms to support the cylindrical cores. Sidewalls and bottom of the tray are integrally formed therewith to define a rigid, unitary structure. Ends of the tray can be attached to the inner and sidewalls or can be integrally formed therewith. Trays can be manufactured in different colors for classifying different kinds of mineral cores. The trays can be provided with covers which fit snugly on sides of the trays. The trays are arranged so that a multiplicity of them can be stacked in a compact array with ends exposed and bearing identifying cards or labels. The cards can be removably inserted in supporting clips or frames on ends of the trays.

The invention will be explained in further detail in connection with the drawings, wherein:

FIG. 1 is a fragmentary perspective view of a stacked array of trays embodying the invention.

FIG. 2 is an enlarged perspective view of a tray partially withdrawn from the stacked array of FIG. 1.

FIG. 3 is an enlarged cross-sectional view taken on line 3–3 of FIG. 1 showing details of a first form of tray and an associated cover, part of which is broken away.

FIG. 4 is a cross-sectional view similar to FIG. 3, but on a reduced scale showing a second form of tray.

FIGS. 5, 6, 7 and 8 are exploded end elevational views, partially in section of third, fourth, fifth and sixth forms respectively of different trays.

FIG. 9 is a reduced fragmentary perspective view of the bottom of the sixth form of tray shown in FIG. 8.

FIG. 10 is a perspective view of a seventh form of tray.

FIG. 11 is an enlarged perspective view partially in section taken on line 11–11 of FIG. 10.

FIG. 12 is a fragmentary cross-sectional view on a reduced scale similar to a portion of FIG. 3, showing an eighth form of tray,

FIG. 13 and FIG. !4 are cross-sectional views of ninth and tenth forms of trays.

Referring first to FIGS. 1 and 2, there is shown a shed **20** in which is stacked array of trays **25**. The trays contain mineral earth cores **26** obtained by diamond drilling in or at mine sites. The cylindrical cores **26** are disposed end-to-end and side-by-side in compartments **28** of each tray **25**. FIGS. 2 and 3 show one form of tray structure to best advantage. The tray has a bottom wall **30** which is flat at its underside **32**. A plurality of flutes **32** extend upwardly from wall **30** in spaced disposition to define partitions between compartments **28**. The bottom **34** of each compartment is cylindrically curved. The cores **26** seat snugly in the curved bottoms **34** and are laterally in contact with inner opposing sides **36** of the compartments. Outer lateral sidewalls **40** are integral with bottom wall **30** and have rabbets or grooves **42** extending the full lengths of sidewalls **40**. These rabbets will receive sidewalls **44** of a rectangular cover **50** which will fit snugly on the tray.

End walls **46** of tray **25** are shown attached to ends of the partitions and sidewalls of the tray by screws **48** inserted in screwholes **49**. The end walls **45** of cover **50** will overlap end walls or plates **46** of the tray and flat, rectangular top wall **52** of the cover will fit flush with flat upper ends **54** of the partitions. Cover **50** may also be made of plastic material.

The bottom, side and inside walls of the tray define a unitary structure which can be extruded as a channeled member of indefinite length. The extrusion can be polyvinyl chloride or other tough, durable plastic. It can have any desired color. By the arrangement described it is apparent that the tray provides effective support and protection for the fragile cores **26**. When covers **50** are applied the closed, covered boxes are shipped long distances by a variety of transportation means and the cores will arrive intact and unbroken. Cards **51** bearing indicia **53** can be inserted in clips **55** on end walls **46**, to identify the cores **26** in the tray.

FIG. 4 shows a tray **25A** which is similar to tray **25** and corresponding parts are identically numbered. Tray **25A** has four interior flutes or partitions **32** defining with lateral sidewalls **40** five compartments **28** as contrasted with tray **25** which has three interior flutes or partitions and only four interior compartments. The bottom wall **30**, interior partitions **32** and sidewalls **40*a*** are all integrally formed as a unitary structure. End walls **46*a*** are attached by screws or may be cemented or otherwise fused in place. Sidewalls **40*a*** are higher than partitions **32**. Cover **50** fits on tray **25A**.

FIG. 5 shows a tray **25B** made in part of rigid, plastic rails **32*b*, 40 *b***. Each of the interior rails **32*b*** has lateral concave sides **60** the lower portions of which are cylindrically curved and the upper portions of which are straight. The bottom surfaces **62** of the rails are flat and are secured by screws **64** to baseboard **66** which can be a rectangular plywood board. Inside the tray the rails abut each other at flat, vertical sides **68**. Rails **32*b*** are generally T-shaped in cross section with crossheads **69** at the bottom and pedestals **70** extending upwardly. The rails **32*b*** define long, parallel compartments **28*b*** inside the tray extending the full length of the tray just like compartments **28** in trays **25** and **25A**. Side rails **40*b*** are generally L-shaped in cross section with depending narrow flanges **72** abutting lateral edges of baseboard **66** and receiving screws **74**. Screws **75** extend upwardly from the baseboard into lower sections **76** of rails **40*b***. Inner sides **60'** of rails **40*b*** are concave and cylindrically curved like sides **60** of rails **32*b*** to define compartments with adjacent rails. End walls or plates **46*b*** may be attached to ends of the rails **32*b*, 40*b*** and to ends of baseboard **66** by screws **73** inserted into screwholes **77, 78**.

A particular advantage of the structure of tray **25B** is the modular arrangement of rails. As many rails **32*b*** as desired can be assembled in side-by-side disposition to make a tray of any desired number of compartments. Great economies in manufacture are effected by mass producing rails **32*b*** and **40*b*** as extrusions of indefinite length subsequently cut into any desired lengths.

FIGS. 6, 7 and 8 show trays **25C**, **25D**, and **25E** which are generally similar to tray **25B** and corresponding parts are identically numbered. Principal differences are in the ways in which the rails of the trays interlock with each other to strengthen the tray structure.

In tray **25C** of FIG. 6, opposite ends of crosshead **69*c*** of some T-shaped rails **32*c*** are formed with dovetail tenons **80**. These tenons fit slidably into dovetail grooves **82** formed in ends of crossheads **69*c*'** of one or more other T-shaped rails **32*c*'**. The tenons **80** also engage in dovetail grooves **84** formed in lower portions **76*c*** of side rails **40*c***. Screws **64** attach baseboard **66** to rails **32*c*, 32*c*'**. End plates of walls **46*c*** are attached to opposite ends of the rails to complete the tray. By the arrangement described the rails interlock and are thus prevented from separating laterally. The dovetail tenons and grooves are interlocked by sliding the rails longitudinally parallel to each other.

In tray **25D** of FIG. **6**, rabbets **86** are formed at opposite ends of crossheads **69*d*** of some T-shaped rails **32*d***. These rabbets receive undercut sides **86'** of one or more other T-shaped rails **32*d'***. Undercut sides **88** of lower portions of L-shaped side rails **40*d*** interfit with rabbets **86**. Screws **64, 74** and **75*d*** secure the rails to baseboard **66** and end walls **46*a*** are attached to opposite ends of the rails to complete the tray.

In tray **25E**, dovetail grooves **90** are formed in the flat bottoms **62*e*** of T-shaped rails **32*e***. These grooves receive dovetail tenons **92** integrally formed on baseboard **66*e***; see FIG. **9**. The tenons are disposed parallel to each other and extend longitudinally of the baseboard. They are spaced apart transversely of the baseboard. The baseboard is formed of plastic material and can be extruded or otherwise formed in indefinite lengths to be cut subsequently to desired lengths and widths. Further dovetail grooves **90'** are formed in bottoms of L-shaped side rails **40*e***. The tray **25E** has the advantage that the rails and baseboard are entirely made of plastic material and the use of screws to attach the rails to the baseboard is avoided. End walls **46*e*** can be cemented or otherwise attached to the rails and baseboard to complete the tray.

FIGS. **10** and **11** show a tray **25F** which is molded as a unitary structure of plastic material. The end walls **46*f*** are integral with the ends of sidewalls **40*f*** and inner partitions or flutes **32*f***. Partitions **32*f*** are joined by integral cylindrically curved webs **91**. The compartments **28** receive cylindrical mineral earth cores **26**. Rabbets **42** seat sides of a cover such as cover **50** shown in FIGS. **3** and **4**. Tray **25*f*** is very light in weight and is fabricated with a minimum use of material. The rounded bottom **92** of webs **91** are coplanar in bottom plane P with bottom edges **40*f'*** of sidewalls **49*f***, and with bottom edges **46*f'*** of end walls **46*f***. This insures a very strong tray which can withstand much rough handling, insertion and removal of heavy cores and repeated reuse. The tray can be made in any desired color depending on the color coding required for any system of core classification. Identification card **51** fits removably in integral frame **55*f*** on end wall **46*f***.

Tray **25G**, a part of which is shown in FIG. **12** has sidewalls **40*g***, interior partitions **32*g*** and bottom **66*g*** made entirely of molded plastic material as a unitary structure. End walls **46*g*** are subsequently attached to opposite ends of the sidewalls, partitions and bottom of tray. Cylindrical and triangular chambers or passages **96, 97** and **98** are provided to save in use of plastic material and to lighten the weight of the tray without materially reducing the strength of the tray.

Tray **25H** shown in FIG. **13** is constructed like tray **25E** of FIG. **8**, except that triangular passages **97'** and **98'** are formed in sidewalls or rails **40*h*** and in interior partitions or rails **32*h***. This lightens the weight of the tray and saves plastic material without materially reducing the strength of the tray. Other parts corresponding to those of tray **24E** are identically numbered.

Tray **25I** shown in FIG. **14** is constructed like tray **25A** with sidewalls **40*i*** higher than inner partitions **32*i***. Passages **97''** and **98''** which are generally triangular in cross section are formed in the sidewalls and inner partitions to lighten the weight of the tray and save plastic material without materially reducing the weight of the tray. Other parts corresponding to those of tray **25A** are identically numbered.

All forms of trays can be made in various different colors to facilitate ready identification and classification. All trays have compartments with cylindrically curved bottoms to receive cylindrical cores and to support the same both laterally and underneath. The trays made of plastic material are weather resistant and will not warp, corrode, crack or change in dimensions under all kinds of climatic conditions and wide variations in temperatures. They will resist moisture and cold of rain, snow, ice, etc. The plastic trays are very strong and light in weight, being about one quarter the weight of comparable wood trays of the same size. This facilitates transportation, storage and use.

We claim:

1. A tray for supporting a plurality of cylindrical mineral earth cores, comprising a horizontal bottom wall; vertical side and end walls; and a plurality of vertical partitions extending upwardly from the bottom wall, said partitions and sidewalls defining therebetween a plurality of compartments between the end walls, each compartment having a cylindrical bottom to seat a cylindrical core therein and having flat parallel spaced sides, the spacing of said sides of the compartments being substantially equal to the diameters of the cores so that the cores are prevented from lateral movements in the compartments, said partitions and sidewalls being formed of molded plastic material, said walls and partitions being formed as individual rails abutted laterally to each other, and fastening means securing the rails to the bottom and end walls.

2. A tray as defined by claim **1** in which the walls and partitions are abutted to each other by dovetail joints.

3. A tray as defined in claim **1** in which the fastening means securing the rails to the bottom wall includes dovetail joints.

4. A tray as defined in claim **1** and each partition being substantially T-shaped in cross section and each sidewall being substantially L-shaped in cross section.

5. A tray as defined in claim **4**, wherein each rail has a passage extending longitudinally therethrough to lighten the weight of the rail and to effect a saving in plastic material.