

April 14, 1953

O. P. ERHARDT

2,635,031

CABINET AND RACK FOR STORING TEST TUBES

Filed April 23, 1945

3 Sheets-Sheet 1

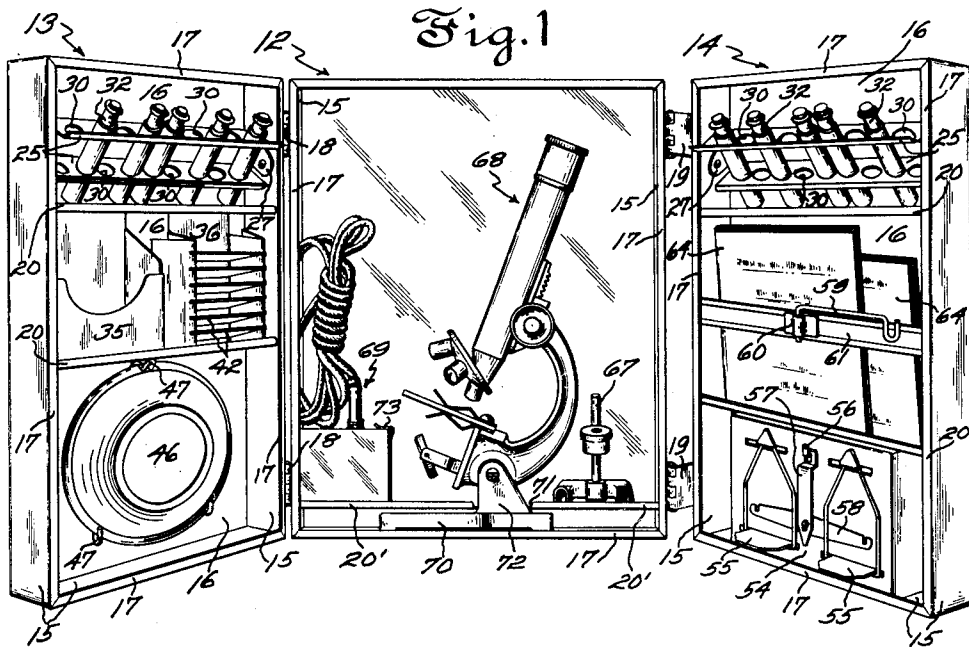


Fig. 1

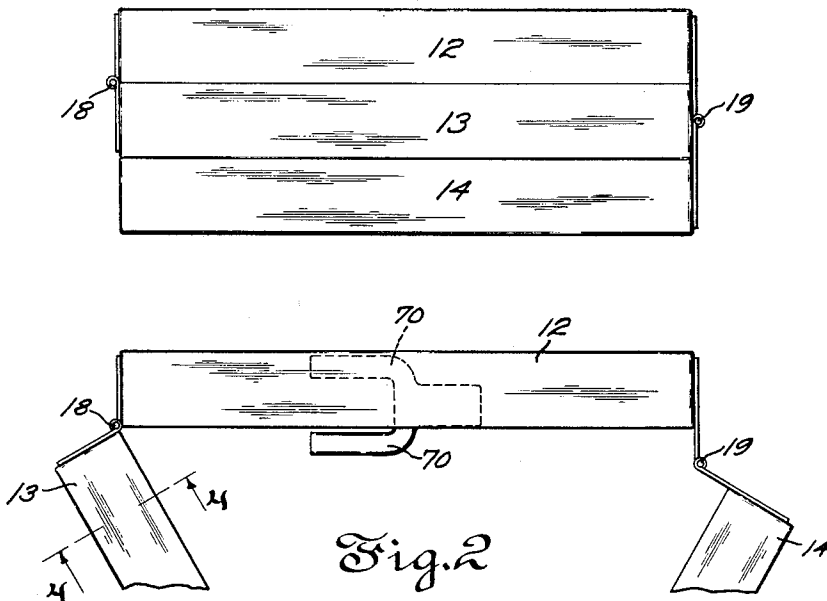


Fig. 2

INVENTOR.

Oscar P. Erhardt,

BY

R. Smith

ATTORNEY

April 14, 1953

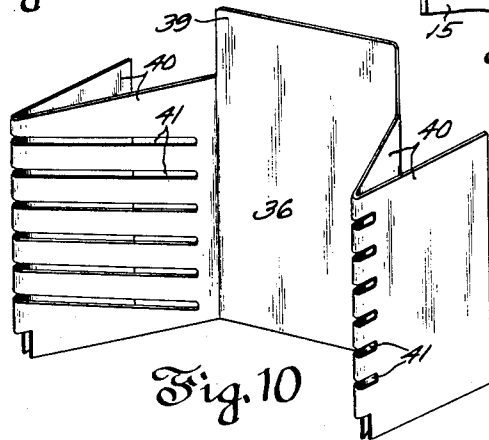
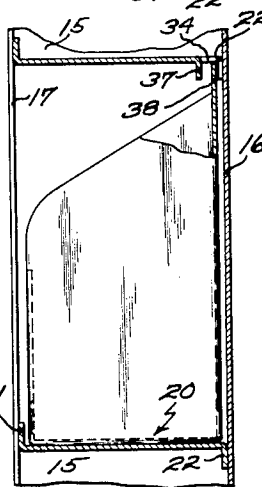
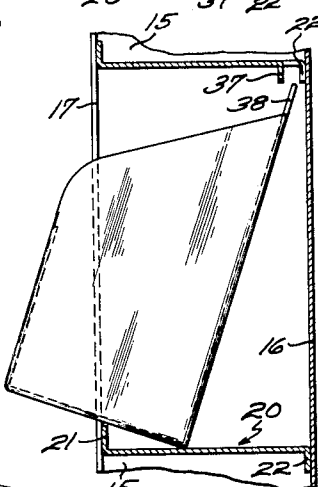
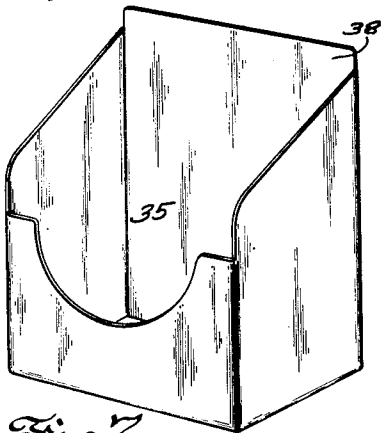
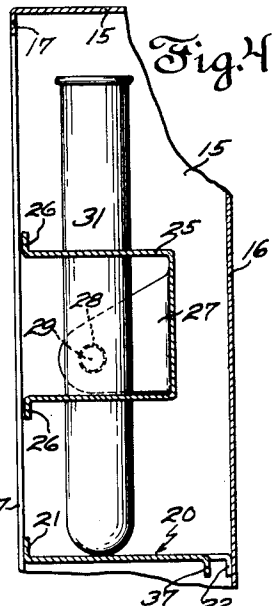
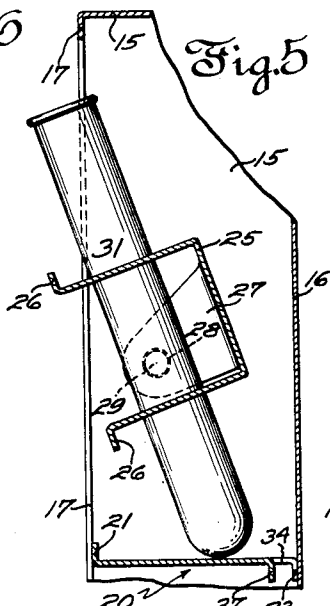
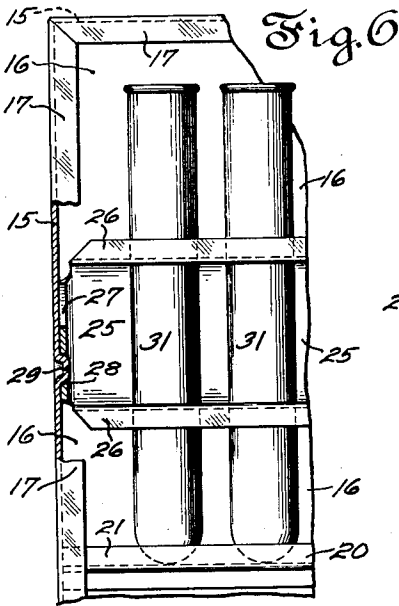
O. P. ERHARDT

2,635,031

CABINET AND RACK FOR STORING TEST TUBES

Filed April 23, 1945

3 Sheets-Sheet 2



INVENTOR.
Oscar P. Erhardt,
BY
R. Smith,
ATTORNEY

April 14, 1953

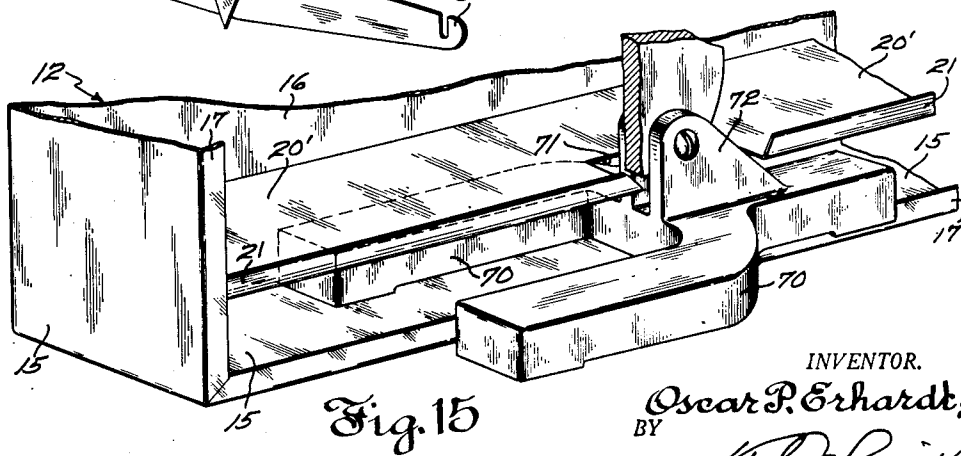
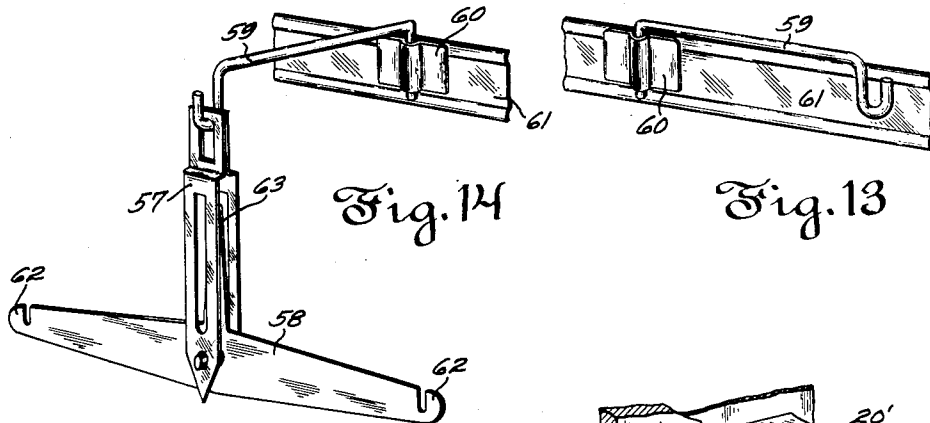
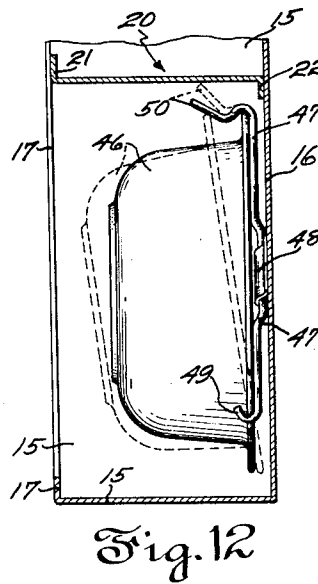
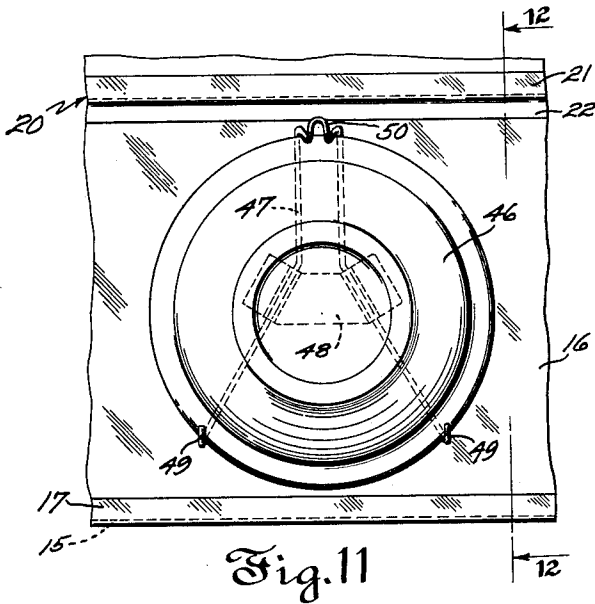
O. P. ERHARDT

2,635,031

CABINET AND RACK FOR STORING TEST TUBES

Filed April 23, 1945

3 Sheets-Sheet 3



INVENTOR.
Oscar P. Erhardt,
BY
[Signature]
ATTORNEY

UNITED STATES PATENT OFFICE

2,635,031

CABINET AND RACK FOR STORING TEST TUBES

Oscar P. Erhardt, West Haven, Conn., assignor
to The A. C. Gilbert Company, New Haven,
Conn., a corporation of Maryland
Application April 23, 1945, Serial No. 589,763

4 Claims. (Cl. 312—328)

1

This invention relates to a convertible carrying case composed of relatively foldable sections capable when unfolded of standing upright to serve as holding racks or open faced cabinet compartments for storing various component parts and supplies of chemistry kits or similar sets of scientific paraphernalia particularly of the toy type sold for instructive experimental use by youngsters.

The present improvements concern both the main organization of such cabinet sections rendering them foldable to produce a closed carrying case and also certain interior rack and shelving constructions with which the cabinet sections may be outfitted in selective arrangement.

One object of the invention is to provide a construction of a cabinet case and such interior fittings that will lend itself to a wide range of differing arrangements and variable distribution of interchangeable shelving and receptacles within the empty spaces of different cabinet sections of uniform size.

Another object is to provide interior receptacle fittings for such cabinet sections which will enable the largest possible variety of paraphernalia to be contained in the smallest possible overall size of cabinet space. Another object is to employ receptacle fittings which may be constructed entirely of sheet metal as the thinness thereof contributes materially to the foregoing objectives as contrasted, say, with wooden fittings.

A further object is to provide tiltable racks for holding removable vials, test tubes, tubular bottles and the like in upright position, such racks permitting a bank of such carried tubular containers to be swung in unison from a stored position closely paralleling the cabinet wall to an outwardly inclined position thus freeing the tops of the tubular containers from any immediately overlying wall or shelf so that the tubular containers can selectively be lifted endwise from their holding rack.

Particular objects of the present improvements concern cooperative interfitting construction of receptacles with fixed shelves enabling the receptacles easily to be removed from and restored to their support shelving and held dependably in place thereon while carrying or containing the working parts of the paraphernalia which they serve to store.

2

To the above ends and others which will hereinafter become apparent, the present improvements reside in features of construction which will be illustrated and described hereinafter, the following description having reference to the accompanying drawings wherein:

Fig. 1 is a view of the interior of a convertible carrying unit incorporating the invention composed of foldable cabinet sections standing on edge and equipped with receptacles and racks for parts and supplies of experimental working apparatus such as a toy chemistry kit.

Fig. 2 is a fragmentary plan or edgewise view of the cabinet of Fig. 1 with its wing sections swung partially closed.

Fig. 3 is a plan view showing the wing sections of the cabinet fully closed thereby to constitute a carrying case.

Fig. 4 is a fragmentary view drawn on an enlarged scale taken in section on the plane 4—4 in Fig. 2 looking in the direction of the arrows, showing one of the tiltable racks with its carried vials.

Fig. 5 is similar to Fig. 4 showing the rack tilted to dispose the vials for ready withdrawal therefrom.

Fig. 6 is a fragmentary view of a top corner of the cabinet looking from the left at the tilting shelf of Fig. 4.

Fig. 7 is a perspective view of a receptacle bin removed from its cabinet space.

Figs. 8 and 9 are views looking in the same general direction as Fig. 4 showing the bin of Fig. 7 inserted respectively partially and fully in its stored position between two of the shelves of the cabinet.

Fig. 10 shows a storage rack receptive to glass slides for a microscope removed from its cabinet space.

Fig. 11 is a front view of a crucible or mixing bowl supported on the interior of the cabinet wall.

Fig. 12 is a view taken in section on the plane 12—12 in Fig. 11 looking in the direction of the arrows.

Fig. 13 is a fragmentary view of the hanger bracket for the weighing balance of Fig. 1, drawn on an enlarged scale.

Fig. 14 shows the hanger bracket of Fig. 13 swung forward and supporting the hanger head

50

3

of the balance beam ready to receive its weighing platforms for working use.

Fig. 15 is a fragmentary perspective view of the base portion of the central cabinet section, and shows the special storage space provided for the base of a microscope.

In Fig. 1 I have shown one of many differing arrangements that may be made of the shelving and receptacle or container equipment within the separate hollow spaces provided respectively by the central cabinet section 12 and the cabinet wing sections 13 and 14. Border walls 15 of the cabinet sections may be formed by bending over flange extensions of the sheet metal of the back walls 16 and these border walls are again bent over to form lip edges 17. The corner joints between the border walls 15 may be welded, brazed or soldered to make each cabinet section a rigid hollow structure.

A set of coupling hinges 18 have relatively short flaps secured respectively to the central cabinet section 12 and to the left wing section 13 swingably connecting these two cabinet sections so that they fold into direct abutting contact, whereas a different set of coupling hinges 19 have relatively long flaps secured respectively to the central cabinet section 12 and to the right wing section 14 leaving the left wing section 13 free and enabling the right wing section 14 to swing into overlapping relation thereto in the closed or case forming relationship of the cabinet sections. Thus the left wing section 13 becomes sandwiched between the central section 12 and the right wing section 14 as clearly shown in Fig. 3.

At selective levels in any one of the cabinet sections I may provide shelves 20 equal in width to the hollow depth of the cabinet section and equal in length to the width of the cabinet section. Such shelves are secured to the back wall 16 and to border walls 15 by welding, or screws or rivets or other fastening means. The front edge 21 of each shelf is upturned and the back edge 22 downturned as best shown in Figs. 4, 5 and 9.

In working conjunction with such shelves the present improvements novelly provide a tiltable rack 25 comprising a sheet metal channel strip which as best shown in Figs. 5 and 6 is made rigid and smooth at its front edges by bent over lip flanges 26, 26 extending the entire length of the rack. A cantilever hinge flap 27 is provided by bending forward the sheet metal of the channel strip at each end of the rack. Each such flap is resilient and contains a bearing hole 28. The flap has enough give so that this bearing hole can be sprung into and out of pivotal engagement with an inward struck boss 29 forming a fulcrum on the border wall 15 thus giving the flaps at opposite ends of each rack coaxially aligned pivotal support in the cabinet section. Thus each bracket 25 can tilt about its pivotal axis from its position in Fig. 4 to its position shown in Figs. 1 and 5. A series of pairs of coaxial receptacle holes 30 in each tiltable bracket are adapted to guide and support elongated bottles such as test tubes 31 or vials 32 which may be inserted through holes 30 so that their bottom ends rest on the underlying shelf 20. Thus a whole bank of such test tubes or vials may simultaneously be swung from a position as indicated in Fig. 4 to a position as shown in Figs. 1 and 5 disposing them for ready withdrawal endwise from the rack. At other times the rack and its supported containers may remain in retracted position as in Fig. 4 and will automati-

4

cally be tilted back to their retracted position by the closing together of cabinet section 14 against section 13 as in Fig. 3.

Also in conjunction with the shelves 20, I may provide box-like bins such as 35 or some more specialized form of sheet metal receptacle such as the glass-slide carrier 36, each of which receptacles is characterized by having a planar bottom capable of resting flat upon an underlying shelf 20 and an upward projecting terminus of its rear wall which I refer to as a tuck edge because adapted to be inserted into an imprisoned position back of a catch tongue 37 struck downward from the metal of an overlying shelf 20 at a point spaced a little forward from the back wall 16 of the cabinet. This makes a slot-like opening 34 in the shelf adjacent cabinet wall 16. The tuck edge of bin 35 is indicated at 38 while the corresponding top tuck edge of the slide carrier 36 is indicated at 39. If desired the tuck edges 38 and 39 may be inserted into the said slot-like openings. The slide carrier 36 is equipped with V-shaped wings 40 the laterally inward branches of which are perforated by the sloping slots 41 in which can be inserted for convenient withdrawal therefrom the glass slides 42 carrying specimens for microscopic examination.

Figs. 11 and 12 show means for removably supporting a piece of hollow ware such as a bowl or crucible 46 consisting of a spring wire clamp 47 firmly fixed on the back wall 16 of the cabinet section by a suitable strap 48 welded to the latter. The spaced bottom hooked ends 49 of clamp 47 serve as support for the edge of bowl 46 while the liftable catch end 50 yields resiliently upward to permit the rim of bowl 46 to be forced forward or backward past the catch end 50 between its retained full line position and its displaced broken line position in Figs. 11 and 12.

The central cabinet section 12 is shown in Figs. 1, 2 and 15 to be specially equipped to contain and steadily position a stored microscope outfit, which may consist of the microscope stand 68 with various appurtenances such as the electric illuminating unit 69 and accessory rack 67. The base 70 of the microscope needs to be heavy and of appreciable foot area. In fact, for good stability, such base should be wider than the desirably shallow depth of a cabinet section. Therefore, I have devised a storage arrangement for a microscope base which is overwidth in relation to the cabinet depth. Referring again to Figs. 1, 2 and 15, a modified form of shelf 20' is fixedly secured in cabinet section 12 near enough to the bottom border wall 15 thereof closely to overlie the microscope base 70 when the latter is inserted edgewise between such shelf and border wall. A cut-out 71 in shelf 20' accommodates the standard 72 of the microscope. As shown in Figs. 2 and 15 this arrangement leaves part of the width of the microscope base projecting outboard of the depth limit of cabinet section 12 but this outboard portion of base 70 is received into and housed by the hollow interior of wing section 13 of the cabinet when the latter is swung closed against cabinet section 12. Suitable spring clamp means such as 73 may be provided to retain the illuminating unit 69 and other accessories of the microscope lodged in place.

A cabinet space between the back wall 16 of cabinet section 14 and a cross bar 61 having its ends fixed to border walls 15 can be used to store easily removable instruction books 64 or memorandum pads which can rest edgewise upon shelf 20.

5

In the lower compartment of cabinet section 13 a suitably perforated upright partition 54 provides holding structure in which the balance pans 55 of a weighing scale are removably lodged for storage. On partition hook 56 there is hung for storage the suspension head 57 that pivotally supports the balance beam 58 of the weighing scales. When it is desired to make use of the balance for weighing out ingredients such as powdered or crystallized forms of chemicals which may be stored in vials 32 the suspension head 57 and balance pans 55 are removed from partition 54 and the former is then hung on a hooked swingable bracket rod 59. The anchored end of bracket 59 is pivotally supported in a hinge clip 60 fixed on a cross bar 61. Bracket rod 59 is thus swingable between its extended position shown in Fig. 14 and its retracted position shown in Fig. 13. For use in weighing, the balance pans 55 are hung respectively on the notched ends 62 of beam 58. The beam pointer 63 indicates the condition of balance.

While Figs. 4 and 5 indicate that the bottom ends of the test tubes 31 rest on the shelf 20 and sweep thereacross as the rack 25 tilts between its positions in Figs. 4 and 5, this action is allowed by freedom of vials 31 to slide lengthwise in rack holes 30. If preferred, the vials 31, or other elongated articles to be removably carried by the rack, may be so lodged on the rack that the rack supports their whole weight as the rack tilts, in which case the bottoms of the vials may be held spaced above the underlying shelf 20. Other modifications in details of the illustrated construction will be suggested by the disclosure herein to those skilled in the art and the following claims are directed to and intended to cover all obvious substitutes and equivalents for the exact parts and arrangements disclosed.

I claim:

1. A cabinet for removably storing elongated articles in upright position therewithin, embodying in combination with a section of said cabinet containing an article storage space, a stationary shelf fixed in said section, and a rack for tilting elongated articles pivotally supported in said storage space above said shelf in a manner to be rockable about a horizontal axis relatively to said shelf, said rack carrying slide bearings arranged to receive said articles and guide them in lengthwise sliding movement relative to said rack in directions crosswise said horizontal axis while permitting the bottoms of said articles to rest on and sweep across said stationary shelf as the rocking of said rack tilts said articles in said storage space.

2. A hollow cabinet for removably storing elongated articles as defined in claim 1, in which the said rack includes a channel member horizontally elongated in parallel relation to the said shelf, said channel member having vertically spaced walls containing a series of respectively coaxial holes adapted to receive and admit through said walls a series of the said elongated articles, and flaps on respectively opposite ends of said channel member pivotally supported in said cabinet section to rock on the said horizontal axis.

3. A hollow cabinet as defined in claim 1, in

6

which the said rack includes a channel member provided with a pivot affording wall at each end thereof extending crosswise the said horizontal axis, at least one of said end walls comprising a cantilever resilient flap, and a fulcrum on the said cabinet section pivotally supporting said end walls of the rack, said flap pivotally engaging said fulcrum in a manner to permit the flap to be sprung temporarily out of engagement therewith for removing the rack from the cabinet.

4. A cabinet for removably storing elongated articles in upright position therewithin, embodying in combination with a section of said cabinet containing an article storage space, a stationary shelf fixed in said section, and a rack for tilting elongated articles pivotally supported in said storage space above said shelf in a manner to be rockable about a horizontal axis relatively to said shelf, said rack carrying slide bearings arranged to receive said articles and guide them in lengthwise sliding movement relative to said rack in directions crosswise said horizontal axis with the top ends of said articles above and clear of said bearings while permitting the bottoms of said articles to rest on and sweep across said stationary shelf as the rocking of said rack tilts said articles in said storage space.

OSCAR P. ERHARDT.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
39,952	Perot	Sept. 15, 1863
128,551	Langdon	July 2, 1872
132,632	Cogswell	Oct. 29, 1872
290,153	Vaughan	Dec. 11, 1883
481,618	Jadwin	Aug. 30, 1892
682,046	Johnson	Sept. 3, 1901
752,889	Dieckmann	Feb. 23, 1904
821,745	Reichmann	May 29, 1906
846,553	Cummings	Mar. 12, 1907
850,210	Cady	Apr. 16, 1907
897,087	Grant	Aug. 25, 1908
911,442	Preston	Feb. 2, 1909
955,041	Barell et al.	Apr. 12, 1910
997,091	Reichmann	July 4, 1911
1,000,803	Harrington	Aug. 15, 1911
1,007,319	Williams	Oct. 31, 1911
1,026,268	Kees	May 14, 1912
1,047,224	Hodgson	Dec. 17, 1912
1,057,541	Gettins	Apr. 1, 1913
1,211,829	Eades	Jan. 9, 1917
1,249,910	Deginder	Dec. 11, 1917
1,350,237	Porter	Aug. 17, 1920
1,458,679	Bishop	June 12, 1923
1,573,723	Long	Feb. 16, 1926
1,634,953	McCune	July 5, 1927
1,716,242	Ritsche	June 4, 1929
1,940,877	Ochse	Dec. 26, 1933
2,358,041	Williams	Sept. 12, 1944
2,403,825	Missenbaum	July 9, 1946
2,408,227	Ramsey	Sept. 24, 1946

FOREIGN PATENTS

Number	Country	Date
556,633	Great Britain	Oct. 13, 1943