March 10, 1942. C. P. WELLMAN 2,276,128

PAPERBOARD CARTON

Original Filed Sept. 15, 1937 2 Sheets-Sheet 1

Fig. 1

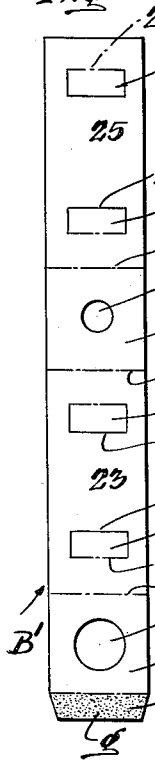



Fig. 2

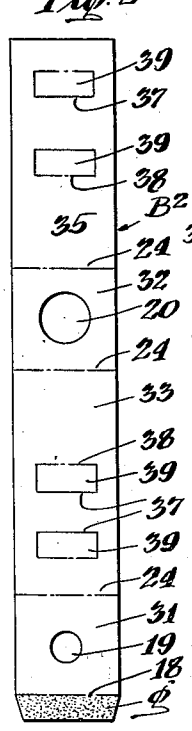



Fig. 4

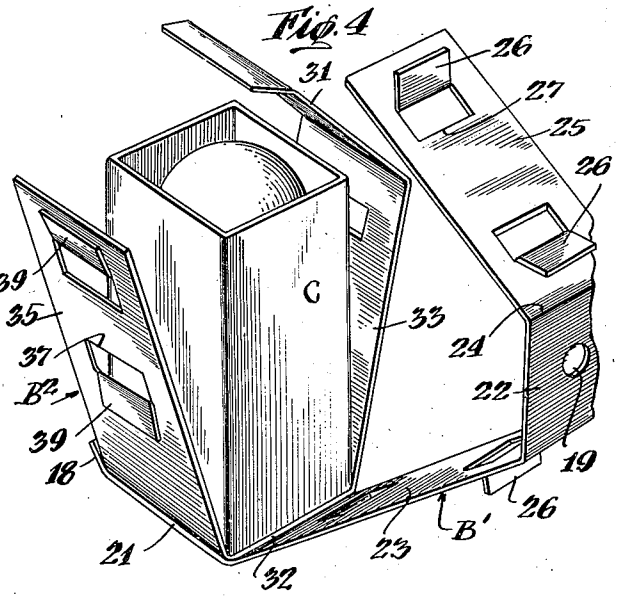



Fig. 3

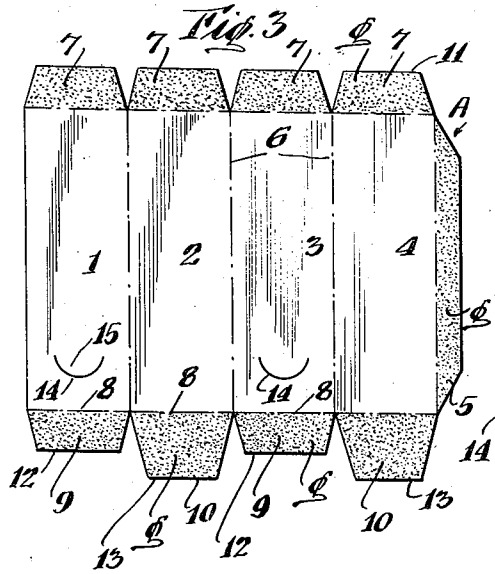
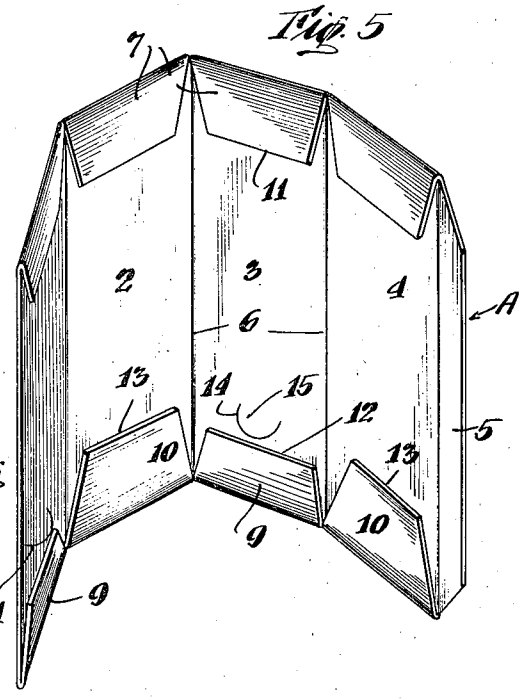



Fig. 5




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Original Filed Sept. 15, 1937 2 Sheets-Sheet 2

Fig. 6

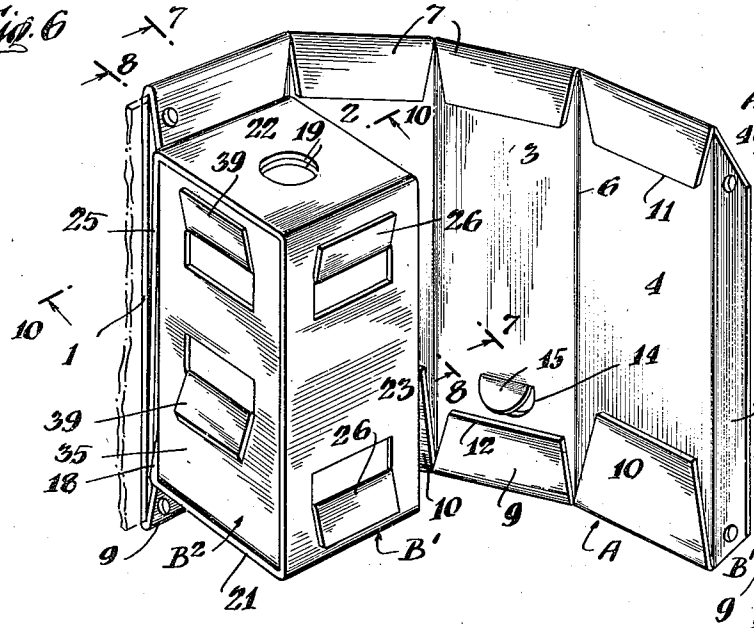


Fig. 8

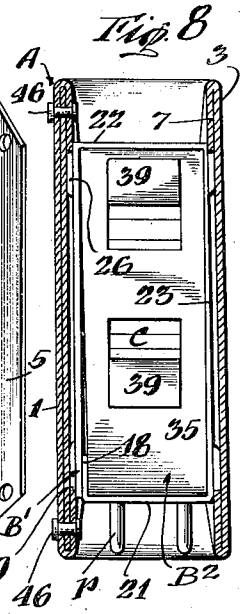


Fig. 7

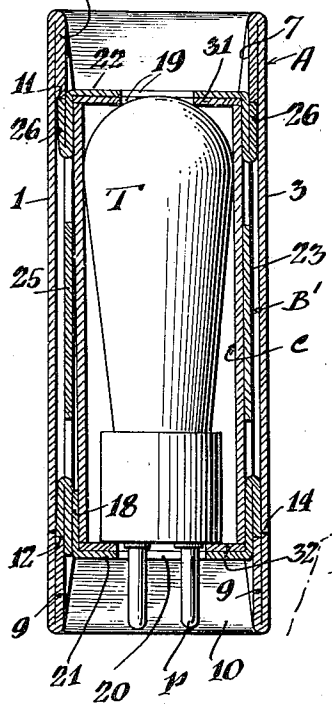


Fig. 9

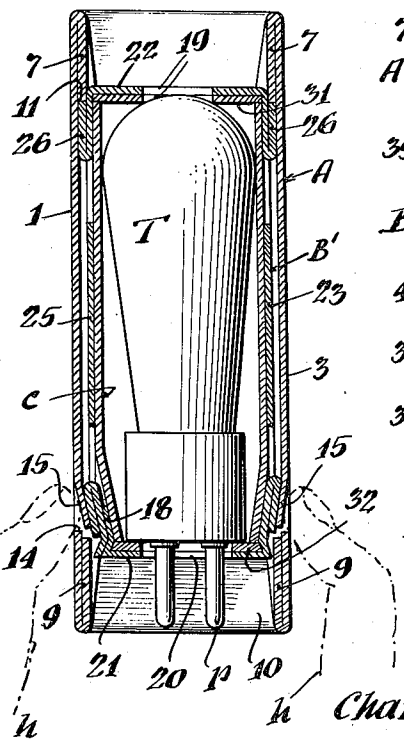
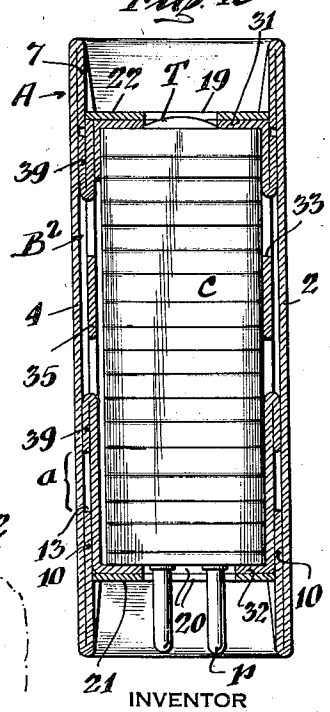


Fig. 10



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Patented Mar. 10, 1942

2,276,128

# UNITED STATES PATENT OFFICE

2,276,128

## PAPERBOARD CARTON

Charles P. Wellman, North Haven, Conn.

Original application September 15, 1937, Serial No. 163,895. Divided and this application July 1, 1939, Serial No. 282,459

11 Claims. (Cl. 229—39)

This invention relates to a paperboard carton, and more particularly a carton adapted for the packaging and merchandising of radio tubes and like fragile articles. This application is a division of my copending application, Serial No. 163,895, filed September 15, 1937, which has ripened into Patent No. 2,165,083, dated July 4, 1939.

It is an object of this invention to provide a carton formed from paperboard material, which protects the radio tube and like fragile article contained therein from possible damage resulting from exterior shock and which is provided with means to permit ejection of the test end of the tube so that the test end can be plugged into a socket and the tube tested without requiring removal of the tube from the carton.

Another object of this invention is to provide a carton for radio tubes and the like which permits limited sliding movement of the tube within the carton whereby ejection of the test end of the tube may be effected, the carton being so constructed that the tube cannot be removed without mutilating, destroying or rupturing the carton in such a manner as to visibly indicate that the carton has been tampered with.

Another object of this invention comprises the provision of a radio tube carton which can be economically formed and assembled from paperboard material with a minimum of hand operation and into which the radio tube or like article may be quickly and easily packed.

Other objects of this invention will become apparent as the disclosure proceeds.

Various other features and advantages of the invention will be apparent from the following particular description and from an inspection of the accompanying drawings.

Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended hereto, the invention itself, as to its objects and advantages, and the manner in which it may be carried out, may be better understood by referring to the following description taken in connection with the accompanying drawings forming a part thereof, in which:

Fig. 1 is an extended view of a prepared blank from which one section of an inner tube-supporting member may be made;

Fig. 2 is an extended view of a prepared blank from which is formed the companion section to the section formed from the blank shown in Fig. 1;

Fig. 3 is an extended view of a prepared blank from which is formed an outer tubular member adapted to be associated with the inner tube-supporting sections illustrated in Figs. 1 and 2;

Fig. 4 is a perspective view of a radio tube housed within a protective shell, this view showing the inner sections formed from the blanks shown in Figs. 1 and 2 in the process of being wrapped around the tube and protective shell;

Fig. 5 is a perspective view of the prepared blank shown in Fig. 3 in the process of being formed into an outer tubular member which receives the tube and associated inner sections illustrated in Fig. 4;

Fig. 6 is a perspective view of the inner sections shown in Fig. 4 as they appear when fully assembled around the tube and protective shell, the outer encasing member being shown in the process of being wrapped around the inner tube-supporting sections;

Fig. 7 is a vertical cross-sectional view of the carton as it appears when fully assembled, this view showing the carton in cross-section as it would appear if the section were taken through a finished carton at lines 7—7 of Fig. 6;

Fig. 8 is a vertical cross-sectional view through the carton as it would appear if the section were taken through a finished carton along line 8—8 of Fig. 6;

Fig. 9 is another vertical cross-sectional view through the completed carton, this view showing the points where pressure may be applied to release the locking abutments which retain the test end of the tube in housed position within the outer tubular member; and

Fig. 10 is a vertical cross-sectional view through the completed carton, illustrating more particularly the means for limiting the sliding movement of the inner member within the outer member, this view being taken through a completed carton as it would appear along the lines 10—10 of Fig. 6.

Similar reference characters refer to similar parts throughout the several views of the drawings and the specification.

Referring more particularly to the drawings, my improved pilfer-proof carton for radio tubes and the like may be made from an outer tubular member A formed from the blank shown in Fig. 3 and an inner sliding member B comprising sections $B^1$ and $B^2$ formed from the blanks shown in Figs. 1 and 2 respectively. The outer tube-forming blank, as shown in Fig. 3, comprises side wall sections 1, 2, 3 and 4 hinged together along score lines 6. A securing flap 5 hinged to the side wall section 4 along score lines 6 has adhesive *g* applied thereto which secures the flap

to the free edge of the side wall section 1 and maintains the outer member in tubular form. Abutment flaps 7 extend from the respective side wall sections at one end of the carton, which abutment flaps may be folded downwardly against the inside face of the respective side wall sections 1, 2, 3 and 4, and, if desired, secured thereto by adhesive *g*, as illustrated in Fig. 5. The lower end of the outer tube-forming blank is provided with a pair of upwardly positioned abutment flaps 9 hinged to side wall sections 1 and 3, respectively, along the score lines 8 and secured to the inside face of said side wall sections by adhesive *g*, as illustrated in Fig. 5. Abutment flaps 10, which are somewhat longer than the abutment flaps 9, are hinged to the side wall sections 2 and 4 along the score lines 8 and are also secured to their associated side wall sections by adhesive *g*. The purpose served by the abutment flaps 7, 9 and 10 will be hereinafter brought out.

The inner tube-containing section $B^1$ formed from the blank illustrated in Fig. 1 comprises an end wall portion 21 having an aperture 20 through which the test end *p* of the tube T extends. An end wall portion 22 extends over the top end of the tube T, the tube being suitably centered by an aperture 19 in the end wall portion 22. A side wall portion 23 hinged to the end wall portions 21 and 22 along the score lines 24 extends along one side of the tube. A side wall portion 25 hinged to the end wall portion 22 along the score line 24 extends along the opposite side of the tube and is secured at its free end to the end wall portion 21 by means of a securing flap 18 hinged to the end wall portion 21, this attachment being made in any suitable manner, as by applying adhesive *g* to the flap 18.

A companion inner tube-supporting section $B^2$ is formed from the blank shown in Fig. 2, which blank is very similar to the blank shown in Fig. 1, heretofore described, comprising an end wall portion 32 having an aperture 20 through which the test end *p* of the tube extends, and an end wall portion 31 which extends over the top end of the tube, the tube being suitably centered by an aperture 19 therein. A side wall portion 33 hinged to the end wall portions 31 and 32 along score lines 24 extends along one side of the tube. A side wall portion 35 hinged to the end wall portion 32 along the score line 24 extends along the opposite side of the tube and is secured at its free end to the end wall portion 31 by means of adhesive *g* applied to securing flap 18 hinged to end wall portion 31.

In loading the tube T in the carton, the tube may, if desired, be first inserted within an inner protective shell C, of any suitable form. The test end *p* of the tube is inserted through the opening 20 in the end wall portion 32 of section $B^2$. The side wall portion 33 is then raised upwardly so as to extend along one side of the tube T and its associated protective shell C, as illustrated in Fig. 4. The end wall portion 31 is then brought over the top end of the tube and the tube is suitably centered therein by means of the opening 19. Side wall portion 35 hinged to end wall portion 32 along the score lines 24 may then be raised so as to overlie an opposite side wall face of the tube, the side wall portion 35 being secured as by adhesive *g* to the securing flap 18 hinged to the end wall portion 31 along the score lines 24. Section $B^2$ thus forms a continuous band enclosure for the tube and its associated protective shell C.

The inner tube-supporting section $B^1$ may then be applied by inserting the test end *p* of the tube through the opening 20 in the end wall portion 21, the end wall portion 21 overlying the end wall portion 32 of section $B^2$. Side wall portion 23 is then raised to overlie an uncovered side of the tube T or protective shell C and the end wall portion 22 brought into position to overlie the end wall portion 31 of section $B^2$. Side wall portion 25 is secured to the end wall portion 21 by means of adhesive *g* applied to the securing flap 18. As thus assembled, the tube T and associated protective shell C are entirely contained or enclosed within the bandlike tube-supporting sections $B^1$ and $B^2$.

When the inner tube-supporting sections $B^1$ and $B^2$ have been fully assembled around the tube, as illustrated in Fig. 6, the outer tube-forming blank, assembled in the form shown in Figs. 4 and 5, is then wrapped around the inner assembled tube-supporting sections. In this connection it will be observed that abutment flaps 26 have been cut out of the side wall portions 23 and 25 along the cut lines 27, the abutment flaps 26 being turned upwardly along score lines 28. Similar abutment flaps 39 have been cut out from the side wall portions 33 and 35 along cut lines 37, and the abutment flaps 39 are also turned upwardly by bending same along score lines 38, as illustrated in Fig. 6. It will be noted that, as thus assembled, the abutment flaps 26 and 39 have a normal tendency to swing laterally but are naturally prevented by the enclosing side wall sections 1, 2, 3 and 4 of the outer tubular member. When the tube is conveniently housed within the outer tubular member, it will be carefully noted, by referring more particularly to Figs. 8, 9 and 10, that the free edges of the abutment flaps 26 and 39 will normally abut the abutment edges 11 of the flap portions 7 cemented to the inside face of the side wall sections of the outer tubular member. The abutment flaps 26 and 39 exert a resilient pressure against the inside face of side wall sections 1, 2, 3 and 4 and when the tube is fully housed within the carton, as shown in Figs. 8, 9 and 10, the abutment edges 11 of the flaps 7 will substantially abut the free edges of the abtument flaps 26 and 39 and thus prevent removal of the tube from the upper end of the carton.

Adjacent the lower end of the carton, abutment flaps 26 are cut out from the side wall portions 23 and 25 along cut lines 27 and are folded downwardly along the score lines 28. The free edges of the abutment flaps 26 normally seat against the abutment edges 12 of the flaps 9 associated with the side wall sections 1 and 3 of the outer tubular member, as illustrated in Fig. 8. Ejection of the test end of the tube from its housed position within the outer tubular member is thus normally prevented and the test end of the tube is thus releasably locked in housed position within the outer tubular member. Means for releasing the abutment flaps 26 and 9 will now be described.

The abutment flaps 26 normally resiliently press against the adjacent side wall sections 1 and 3 respectively, and are thus normally in abutment with the abutment edges 12 of the flaps 9. By exerting inwardly directed pressure on the abutment flaps 26 by the thumb and forefinger *h*, or other suitable means, as illustrated in Fig. 9, the abutment flaps 26 may be pushed out of abutting engagement with the flaps 9 and the test end of the tube thus fully ejected. The ap-

plication of this pressure to side wall sections 1 and 3 may be facilitated by either cutting an opening in the side wall sections 1 and 3 or, preferably, by making a cut 14 in the side wall sections 1 and 3 lying adjacent the abutment flaps 26 so as to provide a flap portion 15 which will readily swing inwardly when inwardly directed external pressure is applied thereto. Thus, by merely applying pressure directed against the abutment flaps 26, the tube may be unlocked from its housed position within the outer tubular member and readily ejected for test purposes. When the test has been completed the tube may be slid back into the carton and due to the resilient nature of the abutment flaps 26, they will readily snap into abutting engagement with the abutment edges 12 of the flaps 9.

To limit the ejected position of the test end of the tube, abutment flaps 39 are cut out from the side wall portions 33 and 35 of the inner section $B^2$ along cut lines 37 permitting the abutment flaps 39 to be turned downwardly along the score line 38. As thus arranged, the free edges of the abutment flaps 39 are arranged to be moved into abutting relationship with the abutment edges 13 of the flaps 10 associated with the outer tubular member. When the tube is completely housed within the outer tubular member, as shown in Fig. 10, the free edges of the abutment flaps 39 and the abutment edges 13 of the flaps 10 are spaced a predetermined distance apart, which distance is designated *a* in Fig. 10. When the test end *p* of the tube, however, has been brought to the proper ejected position for test purposes, the free edges of the abutment flaps 39 will then abut the abutment edges 13 of the flaps 10 and thus positively prevent further ejecting movement of the tube.

It will be noted that the abutment flaps 26 and 33 cooperating with the flaps 7 on the outer tubular member and the abutment flaps 39 cooperating with the flaps 10 on the outer tubular member, are so arranged and constructed that their abutting relationship cannot be released or disengaged to permit removal of the tube from the carton without requiring visible mutilation and destruction of the walls of the carton. The tube, however, is free to slide within the outer tubular member a distance sufficient to permit convenient testing of the tube, the length of the sliding movement permitted being governed by the distance *a*, as shown in Fig. 10. As shown in Figs. 8, 9 and 10, the carton is so constructed that neither end of the tube can touch the supporting surface upon which the carton rests, whether the carton is in upright or in inverted position. The test end of the tube cannot be ejected from its housed position until the abutment flaps 26 have been released from their locking abutment with the abutment edges 12 of the flaps 9, in the manner heretofore described. The carton here shown can be economically manufactured from substantially rectangular blanks of paperboard material and when assembled presents an unusually neat and attractive carton.

To further protect the customer against possible pilfering or tampering with the tube contained in the carton, eyelets 46 may be provided to further secure the securing flap 5 to the side wall section 1. Referring more particularly to Figs. 6 and 8, the securing flap 5 may be inserted between the abutment flaps 7 and 9 and the side wall section 1 before the abutment flaps 7 and 9 are secured as by adhesive *g* to side wall section 1. Pilfer-proof eyelets 46 can then be inserted to extend through the abutment flaps 7, securing flaps 5 and the side wall section 1, and by another pilfer-proof eyelet which extends through the abutment flaps 9, the securing flap 5 and the side wall section 1. As thus arranged, it would be impossible to unwrap the outer member A without tearing or lacerating the outer member.

It is now seen that I have provided a carton adapted to contain a radio tube and like fragile article which is so constructed as to permit limited telescoping movement of the tube within the carton so that testing of the tube can be readily executed. The carton is so constructed, however, that removal of the tube from the carton cannot be accomplished without visibly destroying, lacerating or demolishing the carton within which the tube is contained. Means are further provided for normally locking the tube and the test end thereof in housed position within the carton, which means can be readily released upon a predetermined manipulation of the locking parts to permit limited ejection of the test end of the tube. The carton is furthermore so constructed as to prevent the tube from coming into contact with any surface upon which the carton is supported, means being provided to cushion the tube within the carton so that the tube cannot be damaged through the delivery of external shock to the carton itself.

The carton herein disclosed may be conveniently made of paperboard material substantially without waste through the use of automatic cutting, scoring and gluing machines in common use. The carton is so constructed as to permit quick loading thereof with a tube, means being provided to effect quick and positive sealing of the carton which cannot be removed without requiring severe laceration or destruction of the carton itself.

While certain novel features of the invention have been disclosed and are pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes may be made by those skilled in the art without departing from the spirit of the invention.

What is claimed is:

1. A container formed from paperboard material including, an outer member having enclosing side walls, an inner containing member slidably positioned within said outer member, said innner member including spaced end wall portions and a side wall portion connecting said end wall portions, and means for releasably locking said inner member in said outer member, said means including, interior spaced abutments integrally formed as a part of said outer member and defined by a pair of spaced, substantially parallel edges covered by a side wall of said outer member, and spaced laterally extending abutments struck out from the side wall portion of said inner member normally arranged in abutting position with respect to the abutments on said outer member, and means in the side wall of said outer member providing manipulative access to certain of said abutments whereby the locking action of said abutments may be released.

2. A container formed from paperboard material including, an outer tubular member having four enclosing side walls, an inner enclosing member slidably extending into said outer member, said inner member including spaced end wall portions and a pair of side wall portions connecting said end wall portions, and means for releasably locking said inner member in said

outer member, said locking means including, spaced abutments forming a part of said outer member and contained within at least two enclosing side walls thereof, and spaced abutments struck out from each of the side wall portions of said inner member positioned between and adapted to interlock with said spaced abutments of said outer member, and means in the side wall of said outer member providing manipulative access to said interlocking abutments whereby said interlocking abutments may be unlocked and sliding movement of said inner member within said outer member effected.

3. A container formed from paperboard material including, an outer member having enclosing side walls fixedly secured together to form a tubular body, an inner enclosing member slidably positioned in said outer member, said inner member including spaced end wall portions and side wall portions connecting said end wall portions, and means for releasably locking said inner member extending into said outer member, said locking means including, spaced substantially parallel extending abutment edges formed by infolded portions hinged to at least two side walls of said outer member and extending substantially transversely thereof, said inner member having spaced abutment portions struck out from the adjacent side wall portions extending between said abutment edges and adapted to cooperate therewith to lock said inner member in said outer member, and means associated with said outer member giving manipulative access to certain of said abutment portions so as to release the same from locking engagement with the adjacent abutment portion.

4. A container formed from paperboard material including, an outer member having enclosing side walls fixedly secured together to form a tubular body, an inner enclosing member extending into said outer member, said inner member including spaced end wall portions and a side wall portion connecting said end wall portions, and means for retaining said inner member in said outer member, said means including, fixed abutment edges associated with one of said side walls positioned interiorly and spaced from the ends thereof, and resilient abutment portions struck out from the adjacent side wall portions interlocking with the abutment edges of said outer member, and means in the side wall of said outer member providing manipulative access to said resilient abutment portions whereby said resilient abutment portions may be released from their locked position with respect to said fixed abutment edges to retain said inner tube supporting member therein.

5. A container formed from paperboard material including, an outer member having enclosing side walls fixedly secured together to form a tubular body, an inner enclosing member slidably positioned within said outer member, said inner member including spaced end wall portions and opposite side wall portions connecting said end wall portions, and means for releasably retaining said inner member within said outer member, said means including, fixed abutment portions forming a part of said outer tubular member and positioned interiorly thereof, and resilient abutment portions struck out from the side wall portions of said inner sliding member positioned intermediate of and interlocking with the abutment portions of said outer tubular member, and means associated with said outer member giving manipulative access to one of said resilient abutment portions so as to release the same from its locked position with respect to the adjacent fixed abutment portion.

6. A container for radio tubes and the like including, an outer member having enclosing side walls fixedly secured together to form a tubular body, an inner tube-supporting and enclosing member slidably positioned within said outer member, said inner member including spaced end wall portions and side wall portions connecting said end wall portions, and means for limiting the telescoping movement of said inner member within said outer member, said means including, a fixed abutment portion associated with a side wall of said outer member, a resilient abutment portion associated with an adjacent side wall portion of said inner member normally arranged in abutting position with respect to said fixed abutment portion, and means in a side wall of said outer member providing manipulative access to said resilient abutment portion, and means for limiting the ejected position of the test end of said tube.

7. A container for radio tubes and the like including, an outer member having enclosing side walls fixedly secured together to form a tubular body, an inner tube-supporting and enclosing member slidably positioned within said outer member, said inner member including spaced end wall portions and side wall portions connecting said end wall portions, and means for limiting the telescoping movement of said inner member within said outer member, said means including, cooperating resilient and fixed abutments associated with said inner and outer members, and means associated with said outer member whereby pressure may be applied to said resilient abutment portions whereby said abutment portions may be disengaged from their normal cooperative abutting relationship and ejection of the test end of the tube effected, and means for limiting the ejected position of the test end of said tube.

8. A container for radio tubes and the like including, an outer member having enclosing side walls fixedly secured together to form a tubular body, an inner tube-supporting and enclosing member slidably positioned within said outer member, said inner member including spaced end wall portions and side wall portions connecting said end wall portions, and means for limiting the telescoping movement of said inner member within said outer member, said means including, fixed abutment portions positioned interiorly of and at each end of said outer member, resilient abutment portions associated with said inner member and positioned adjacent said fixed abutment portions, means associated with said outer member giving manipulative access to one of said resilient abutment portions so as to release the same from its locked position with respect to the adjacent fixed abutment portion whereby ejection of the test end of the tube may be effected, and means for limiting the ejected position of the test end of the tube.

9. A container for radio tubes and the like including, an outer member having enclosing side walls fixedly secured together to form a tubular body, an inner tube-supporting and enclosing member slidably positioned within said outer member, and means for limiting the telescoping movement of said inner member within said outer member, said means including, elements associated with said inner and outer members preventing ejection of the tube through one end of said tubular body, elements associated with

said inner and outer members for limiting the ejected position of the test end of the tube through the other end of said tubular body, and means for releasably locking the tube and the test end thereof in housed position within said outer tubular body, said locking means including cooperating abutment portions associated with said inner and outer members normally positioned in locked abutment, and means for manipulating one of said abutment portions to release the same from locking abutment with respect to said other abutment portion to permit ejection of the test end of the tube.

10. A receptacle formed from paperboard material including, two container parts adapted to be locked together in telescoping arrangement, a fixed abutment portion presenting a locking edge associated with one of said container parts, a resilient abutment portion associated with the other container part, said resilient abutment portion presenting a locking edge normally arranged in abutting position with respect to the locking edge of said fixed abutment portion, and means accessible from the exterior of said receptacle for manipulating said resilient abutment portion whereby to release said locking edge from abutting engagement.

11. A receptacle formed from paperboard material including, two container parts adapted to be locked together in telescoping arrangement, a fixed abutment portion presenting a locking edge associated with one of said container parts, a resilient abutment portion associated with the other container part, said resilient abutment portion presenting a locking edge normally arranged in abutting position with respect to the locking edge of said fixed abutment portion, means accessible from the exterior of said receptacle for manipulating said resilient abutment portion whereby to release said locking edges from abutting engagement, and other abutments associated with said parts arranged to limit the telescoping movement of said parts after said locking edges have been released from abutting engagement.

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