

Jan. 9, 1951

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2,537,151

CARTON FOR PACKAGING RADIO TUBES AND LIKE ARTICLES

Filed Sept. 12, 1946

3 Sheets-Sheet 1

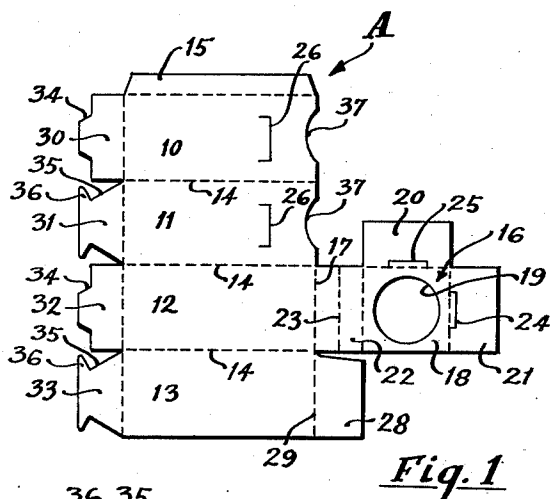


Fig. 1

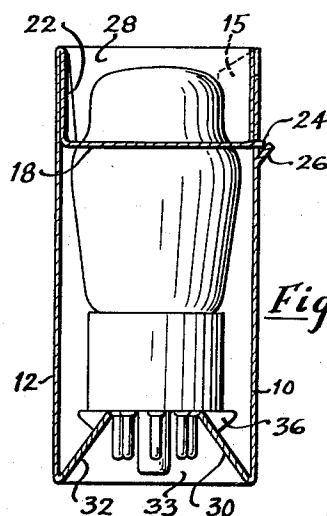


Fig. 2

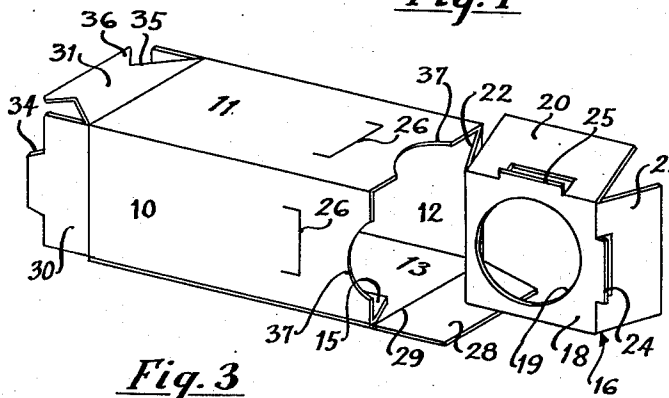


Fig. 3

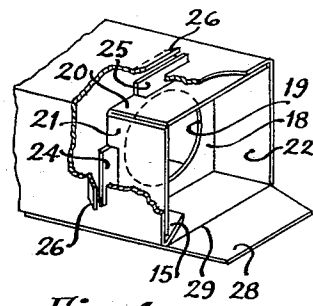


Fig. 4

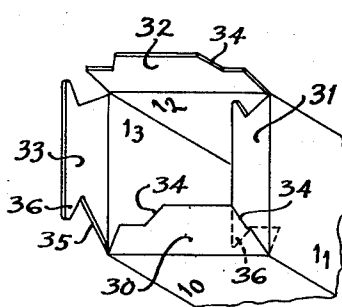


Fig. 5

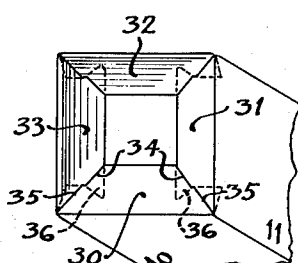


Fig. 6

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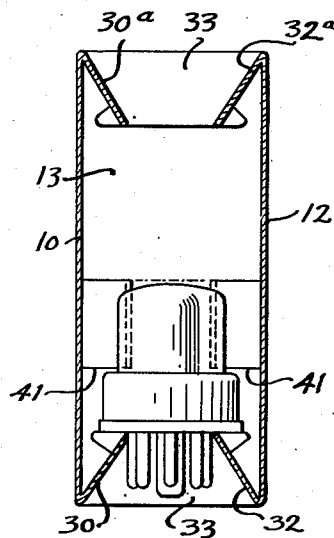
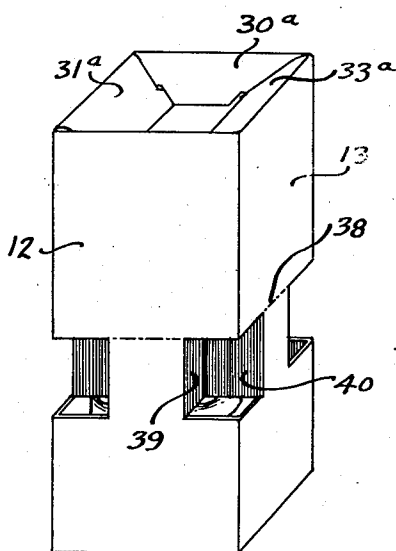
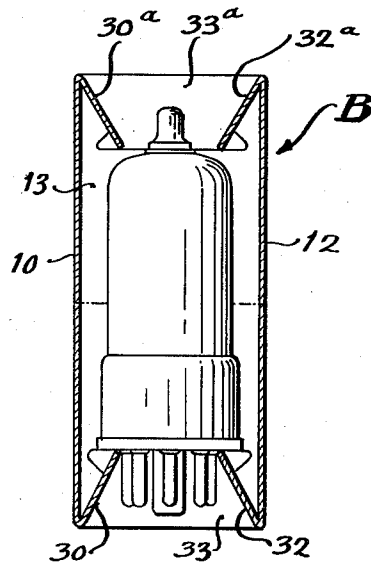
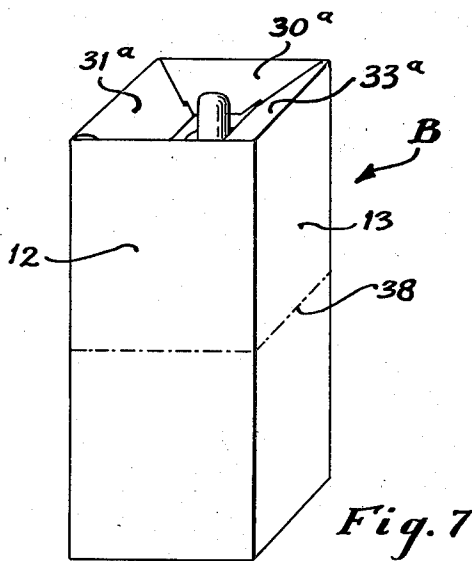
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CARTON FOR PACKAGING RADIO TUBES AND LIKE ARTICLES

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3 Sheets-Sheet 2



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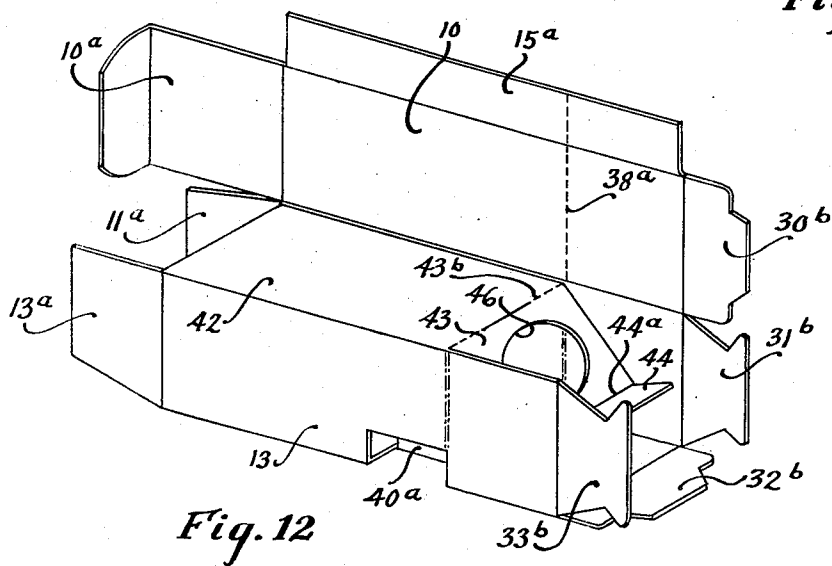
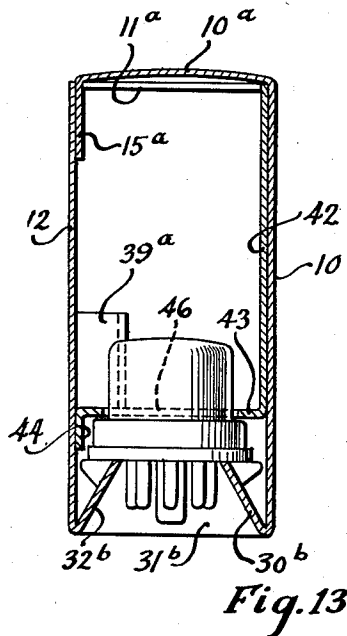
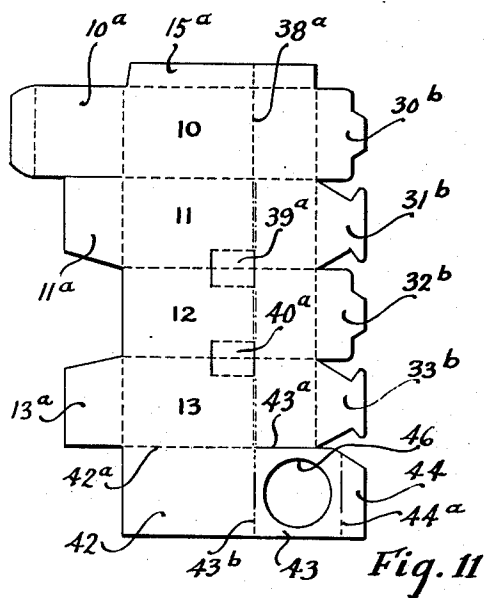
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CARTON FOR PACKAGING RADIO TUBES AND LIKE ARTICLES

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3 Sheets-Sheet 3



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CARTON FOR PACKAGING RADIO TUBES
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1 Claim. (Cl. 229—39)

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This invention relates to cartons for packaging radio tubes particularly and articles of like character.

In the packaging of radio tubes and the like, it is necessary to provide against breakage since such articles are very frangible. Usually, therefore, a package compound in character is necessary employing corrugated wrappers or packing to assure that sufficient cushioning will be provided against breakage. This involves expense and time, both in respect to packaging, unpackaging and the materials involved which is necessarily disadvantageous. The present invention overcomes these difficulties.

It is an object of the present invention to provide a simple carton into which a radio tube or the like may be easily mounted and temporarily locked with adequate provision against breakage and handling.

A further object of the invention is to provide a carton of this kind which involves little more than the average walls and flaps of a carton, thus employing a minimum of material while simplifying packaging and unpackaging operations.

A still further object of the invention is to provide a carton of this kind provided with a special simplified means designed to facilitate the unpackaging of the carton.

With these and other objects in view, the invention generally comprises a carton formed from a blank defining four side walls foldable one to another to form a generally rectangular package, and including a panel and tabs foldable into the interior of the package which include a means of engaging a radio tube or the like in a manner to hold it firmly in spaced relation to the walls of the carton. Preferably the carton includes alternative forms wherein the product may be held in the carton by means of inwardly directed tabs at each end or again by means of the inwardly projecting portions of the side walls cooperating with the tabs at one of said ends of the carton disposed intermediate the ends thereof in order to engage and retain smaller articles which it may be desirable to house in a carton of a size which will normally take larger or longer articles.

The invention will be clearly understood by reference to the following detailed specification taken in conjunction with the accompanying drawings.

In the drawings:

Fig. 1 is a plan view of a carton blank according to the present invention.

Fig. 2 is a longitudinal section taken through a set up carton showing the manner in which it retains a radio tube therein.

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Fig. 3 is a perspective view of the carton in partially set up condition showing the mounting panel and the locking flaps prior to folding into the interior of the carton.

Fig. 4 is a fragmentary perspective view of the upper end of the carton showing the manner in which the mounting panel is folded therewithin and prior to folding of the final flap at this end of the carton.

Fig. 5 is a fragmentary perspective view of the bottom end of the carton showing the manner in which the locking flaps are folded inwardly.

Fig. 6 is a similar view to Fig. 5 showing the locking flaps in complete inwardly folded position.

Fig. 7 is a perspective view of an alternative form of carton.

Fig. 8 is a longitudinal section taken through the carton shown in Fig. 7.

Fig. 9 is a perspective view of a further alternative view of carton.

Fig. 10 is a longitudinal section taken through the carton shown in Fig. 9.

Figure 11 is a plan illustration of the blank of a further alternative form of a carton.

Figure 12 is a perspective view of the blank shown in Figure 11 partially folded as the carton is being set up; and

Figure 13 is a longitudinal section taken through the set up carton of the type shown in Figures 11 and 12.

Referring to the drawings, A indicates a blank for a carton designed to package radio tubes or the like, which blank is made up of four side walls 10, 11, 12 and 13 foldably connected with one another along the fold lines 14. The side wall 10 is provided with the gluing flap 15 so that when the sides are folded in proper manner and the flap 15 secured to the outer edge of side wall 13, a tubular container of rectangular cross-section is formed. To the upper edge of side wall 12 a mounting panel 16 is connected. This is foldable along the fold lines 17 and embodies the central section 18 formed with a circular opening 19, the side and end tabs 20 and 21 and the hinging web 22 formed with the fold line 23 transversely across it intermediate its length. The central section 18 is defined by fold lines between the tabs 20 and 21 and the web 22 to form a panel square in cross-section corresponding substantially to the cross-sectional area of the tube formed by the set-up side walls. Consequently, if the web 22 is folded along the fold line 17 in one direction and folded along the fold line 23 in the opposite direction, such as partially illustrated in Fig. 3, the mounting panel may be

disposed within the upper end of the carton so that it will extend transversely across the interior of the latter a distance from the upper end corresponding to the full length of the web 22. In this instance, the tabs 23 and 21 folding along their line of connection with the centre section 18 will lie against corresponding walls of the carton on the interior thereof, such as illustrated in Figs. 2 and 4. The mounting panel is secured in this position firmly in two ways.

In the first instance, a tongue 24 and a tongue 25 are cut into tabs 20 and 21 such that when the latter are folded at right angles to the centre section 18, they will project outwardly beyond the centre section in the same plane. Consequently when the mounting panel is folded to lie within the upper end of the carton, the tongues 24 and 25 are caused to over-ride the upper edge of slots 26 formed in the upper extremities of walls 10 and 11 of the carton and to press outwardly the tabs 27 normally closing the slots 26. The tabs 27 will have a tendency to press upon the projecting ends of the tongues 24 and 25, thus more firmly to hold the latter in this temporarily locked position. Finally, in respect to holding the mounting panel in position, the flap 28 is carried on the end of side wall 13 and is foldable along its fold line 29 to enter the interior of the carton when it is set up and to engage behind one edge of the flap 21. It may also engage behind one edge of the web 22. Thus, the flap 28 in addition to the flaps 20 and 21 and the web 22 form a reinforcing edge around the top of the carton to provide against inward depression thereof while the locking tongues hold the central section of the panel firmly in position.

The central hole or orifice 19 is formed of a size to receive one end of the article being packaged, such as a radio tube, and thus to hold it in completely spaced relation to all side walls of the carton. This is clearly indicated in Fig. 2. Thus, when the other end of the article is held in a substantially corresponding manner, the spacing between the article and the side walls of the carton function to prevent inadvertent damage to the article if the side walls of the carton are inadvertently depressed to some extent.

The lower end of the carton is designed to hold the article in such spaced relation and is designed to permit ready packaging as well as to lock the article temporarily in its mounted position. In this respect, the lower ends of the side walls 10, 11, 12 and 13 are formed with the flaps 30, 31, 32 and 33, the flaps 30 and 32 corresponding in shape and the flaps 31 and 33 corresponding in shape. The flaps 30 and 32 are formed with the centrally projecting tabs 34, while the flaps 31 and 33 are formed with inwardly sloping side edges 35 and the outwardly projecting tongues 36 at their outer extremities, which forms a substantial notch in each edge of these tabs. The tabs 34 on the other hand are formed with inwardly sloping side edges so that upon turning the flaps 30 and 32 inwardly to extend within the confines of the rectangular tube formed by the assembled side walls 10 to 13 and then turning the flaps 31 and 33 inwardly, the outwardly projecting tongues 36 will brush past the tabs 34 and will lodge beneath their side edges in each instance (see Figs. 5 and 6 for detail). Consequently, in terms of the mounting of a radio tube within the package, the end edges of the flaps 31 and 33 and the end edges of the tabs 34 of the flaps 30 and 32 will engage the base of the tube, as shown in Fig. 2, and hold such tube se-

curely in place disposed between the mounting panel 16 and the inwardly turned bottom flaps of the carton so that the tube is held in spaced relation to the side walls of the package and firmly locked in such position. Thus, in this simple manner, a radio tube or the like can be safely packed and handled with less difficulty and cost than in the case of special wrappings heretofore normally used.

To remove the tube is a relatively simple matter. In this respect, the upper edges of the side walls 10 and 11 are preferably recessed as at 37 to provide thumb and finger notches and the upper extremities of the flaps 20 and 21 are normally uncovered by these recesses. Therefore, by grasping either one of the flaps 20 or 21 and pulling them forcefully, the panel 16 can be disengaged from the tube or other article of this kind, thus to permit its ready removal. Normally, however, without a special removing operation of this kind, the tube is very firmly held in the package and cannot be dislodged in normal handling.

Alternative forms of construction apply with the same advantages and in some cases increased advantage. In this connection, reference is directed to Figures 7, 8, 9, and 10 taking into consideration Figures 7 and 8 in the first instance.

The carton B shown in Figures 7 and 8 is of the same general form but eliminates the panel 16 of Figure 1 as a holding medium for a tube or the like and substitutes in its stead a series of flaps 30a, 31a, 32a (Figure 8) and 33a which correspond exactly to the flaps 30, 31, 32, and 33 of Figure 1 and which are disposed at the opposite end of the carton shown in Figures 7 and 8. Thus, these inwardly directed tabs are designed to engage the opposite end of a radio tube or the like to retain the article firmly in spaced relation to the walls of the carton. Accordingly, therefore, the article is readily packaged by merely turning in the series of flaps 30 to 33 and 30a to 33a to engage the article in a manner shown in Figure 8. In order to facilitate unpackaging, the carton is formed with a transverse weakened line 38 which extends transversely across each side wall of the carton intermediate the ends of the carton so that it is only necessary that its weakened line be broken to separate the carton into two halves thus to permit the ready removal of the article therefrom.

In Figures 9 and 10 a further alternative form is shown which adapts the carton to the packaging of articles of shorter length. In this connection, in addition to the weakened line 38 disposed substantially midway between the ends of the carton, the latter is provided with a series of weakened lines in spaced parallel relation thereto intermediate one end of the carton and said weakened line 38 such that one of each series extends from each corner of the carton partially along each side wall to demark inwardly projectable wall sections 39 and 40. Thus by pressing the corners of the carton inwardly between the parallel weakened lines, the sections 39 and 40 are caused to project inwardly of the carton to form shoulders 41 (Figure 10) so that they will engage a portion of a shorter article to be housed within the carton and thereby hold it as shown in Figure 10 firmly secured between the terminal edges of the flaps 30 to 33. This article may readily be unpackaged by breaking the carton in half along the weakened line 38 as a most convenient manner of unpackaging.

Reference is now made to Figures 11 to 13

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which disclose a still further alternative form of construction. In Figure 11 the blank of the carton is disclosed which generally embodies panels 10, 11, 12 and 13 substantially corresponding with those disclosed in Figure 1 and employing the substantially corresponding flaps 30b, 31b, 32b and 33b, respectively. In addition, the blank includes an end closure flap 10a and the flaps 11a and 13a designed to overlap one another and to underlie the closure flap 10a when the carton is set up as partially shown, for instance, in Figure 13. In addition to these walls, the blank is provided with a fifth wall 42 foldably connected with the wall 13 along fold line 42a. At one end of the wall 42 it is formed into a panel 43 substantially corresponding to the panel 18 in Figure 1 and which in turn is provided with the end tab 44. The panel 43 is supported from the wall 13 along the edge 43a and is foldably connected along the line 43b with the end of the wall 42. The tab 44 is foldably connected along the line 44a with the panel 43.

The wall 42 is designed to underlap the wall 10 of the carton when the carton is set up. This will be relatively clear by reference to Figure 12. Likewise, the panel 43, when folded along the line 43b, is designed to extend transversely across the interior of the carton and is shown as partially folded towards this position in Figure 12. The panel 43 is disposed at a position having regard to the length of wall 42 so as to dispose it transversely across the carton at a predetermined point. In fact, this is determined by the size of the article which it is designed to engage when the latter is disposed in the carton. Assume, for instance, that it is a small radio tube such as illustrated in Figure 13, thus the panel 43 is disposed on the wall 42 so that it may be caused to extend transversely across the interior of the carton in fairly closely spaced relation to the end tabs 30b to 33b. In the case of a larger tube or article, this panel 43 might be disposed so it would extend across the interior of the carton midway between its ends or at some different point according to the requirements of the case.

The blank is folded to set up the carton so that when the end wall 10 is folded down from the position shown in Figure 12 to overlies the wall 42 and is fastened by the gluing flap 15a, the end flaps 30b to 33b are folded to extend inwardly as of the manner of the other forms of construction previously described and such as illustrated in Figures 2, 8, and 10 (see Figure 13). The transverse panel 43 is disposed to extend transversely across a carton in spaced relationship to the inner ends of flaps 30b to 33b. Thus the central orifice 46 in panel 43 is disposed in alignment with the opening formed by the juncture of inwardly folded flaps 30b to 33b. In this connection it will be noted that the tab 44 is folded downwardly to lie along the inner surface of wall 12 of the carton. The panel 12, however, requires support and may be supported in position by means of the inwardly projectable wall sections 39a and 40a, respectively, formed in a manner corresponding to sections 39 and 40 described in connection with Figures 9 and 10. Therefore, the panel may rest against the shoulders formed by these inwardly projected wall sections. As a result, therefore, it will be obvious that if a radio tube or like article is projected through the opening formed at the meeting edges of the inwardly folded flaps 30b to 33b, a portion thereof will pass through the orifice 46 in panel 43 while a shoulder thereof or other outward projection will en-

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gage against the lower surface of panel 43 and will be held. Moreover, as a tube or like article is projected through the opening formed by the flaps 30b to 33b, they will part from one another to permit larger portions of the tube to pass into the carton and will tend to return to the original position when such parts have so passed, thus to engage the lower extremity of such article and retain it in firm mounted position between the panel 43 and such flaps, as clearly shown in Figure 13.

The article so mounted in the carton described is held in spaced relationship to the ends and sides of the carton and the closure flap 10a forming the means of closing the opposite end of the carton. It does not matter whether the article is spaced to a substantial degree from the end flap 10a and flaps 11a to 13a or whether it extends closely thereto. Likewise, it is obvious that the length of the carton might be relatively shorter than that disclosed in Figure 13.

In this form of carton, also, the walls may be formed with the transversely extending weakened line 38a corresponding to line 38 in Figures 7 to 10 so that, if desired, the carton may be broken apart to facilitate the removal of the tube. In this instance, the breaking of the carton along this line would necessarily remove the inwardly projected wall sections 39a and 40a, thus permitting the panel 43 to fold in the opposite direction to release the article. Of substantial importance is the cooperative relation of the inwardly folded interlocking flaps 30b to 33b, as is the case also in connection with the flaps 30 to 33 and 30a to 33a shown in Figures 1 to 6 and 7 to 10, respectively. It is obvious that the inner free edges thereof form supports, firmly to support one end of the article, whereas apart from this efficient holding function it will be obvious that they play an important part in the fast, efficient packaging of the article. In other words, when these flaps are folded in their normal set up position, it is only necessary for the packager to project the tube or other article through the base of the carton and it will automatically move into its proper position and will be automatically locked in this proper position as these flaps return to their normal interconnected position shown in Figures 2, 8, 10, and 13, respectively.

In the foregoing it will be clear that I have produced a simple type of carton which eliminates the necessity of employing special wrappers, etc., and operates to hold articles packed therein in firm spaced relation to the carton through the medium of inwardly projecting means forming a part of the carton which is designed to engage the article and retain it efficiently in the manner required. It is obvious that the carton is simple in manipulation in all the various forms both in the case of packaging and unpackaging.

What I claim as my invention is:

A carton for packaging radio tubes of various lengths but of the class in which each tube has a similar annular enlargement in the region of the base greater in diameter than the diameter of the casing or upper regions of the tube and wherein means are provided for holding the tube rigidly within the carton by engaging the annular enlargement of the tube and comprising a plurality of side walls terminating at one end to form flaps directed inwardly of the carton in a direction toward the opposite end thereof to constitute a loading end, said flaps being deflectable to allow passage of the upper portions of

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a radio tube of the said class and the annular enlargement thereof, means extending inwardly of the carton walls to limit the passage of the tube and its annular enlargement into the carton and spaced from the terminal ends of said flaps a distance greater than the axial depth of the annular enlargement of the tube but less than the distance from the engaged surfaces of the annular enlargement to the extremities of the base of the tube, said flaps being movable after loading of the tube into the carton to a position to engage the base of the tube by their terminal ends, and a platform having a hole designed to accommodate passage of the casing of the radio tube above the annular enlargement of the base thereof and positioned within the carton between the inwardly extending means and the annular enlargement of a radio tube inserted thereinto.

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