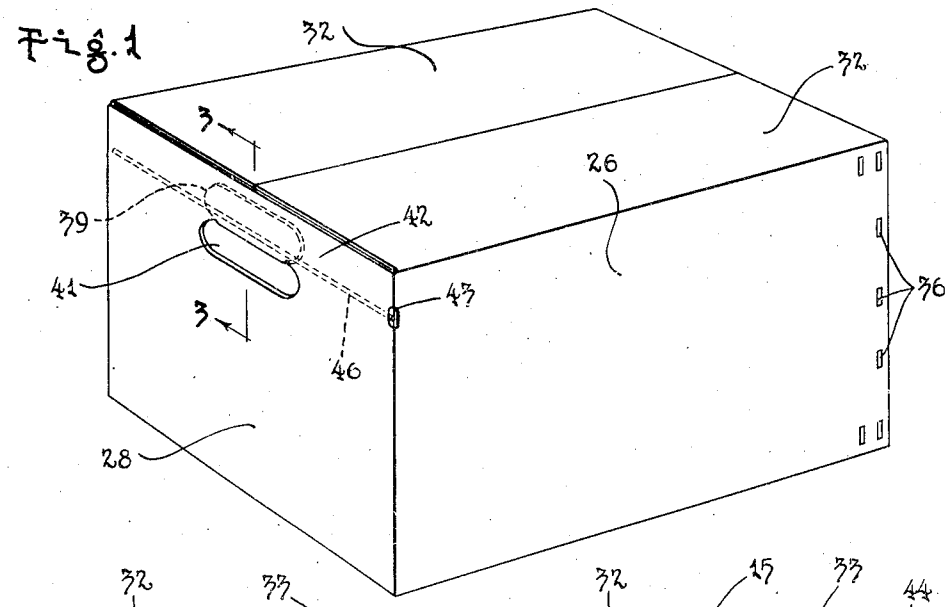
Jan. 12, 1943. J. H. BURR 2,308,050

BOX

Filed April 12, 1940 4 Sheets-Sheet 1

Fig. 1



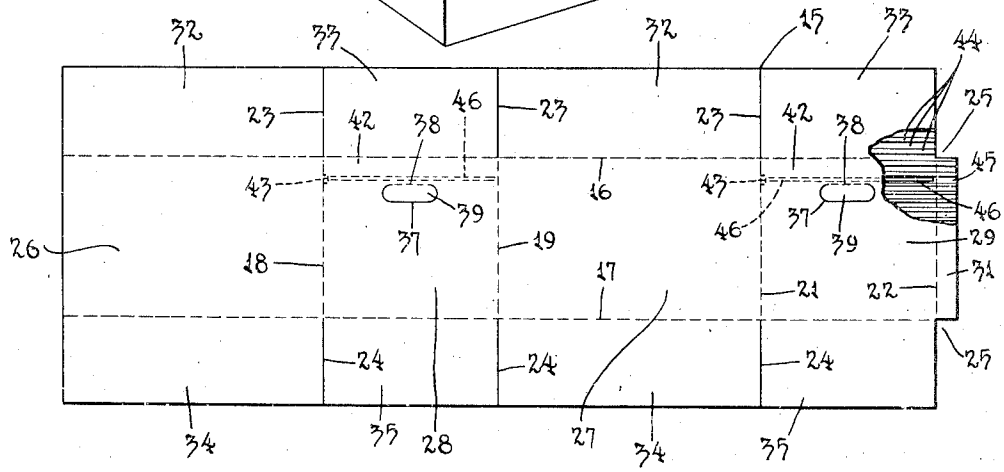


Fig. 2

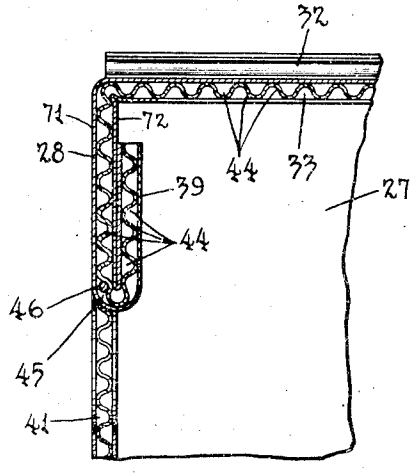


Fig. 3

Inventor

John H. Burr

By Caswell & Lagaard

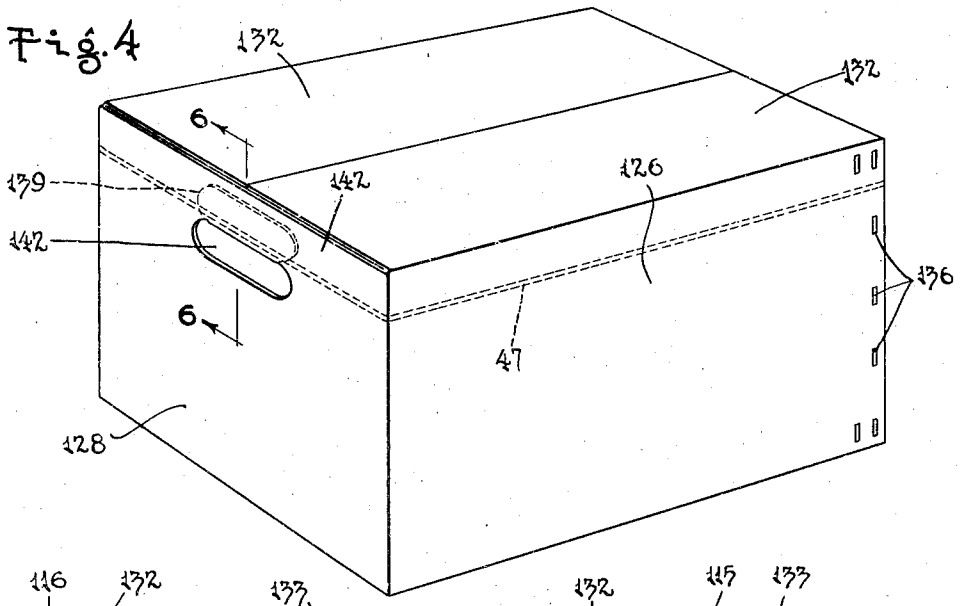
Attorneys

Jan. 12, 1943. J. H. BURR 2,308,050

BOX

Filed April 12, 1940 4 Sheets-Sheet 2

Fig. 4



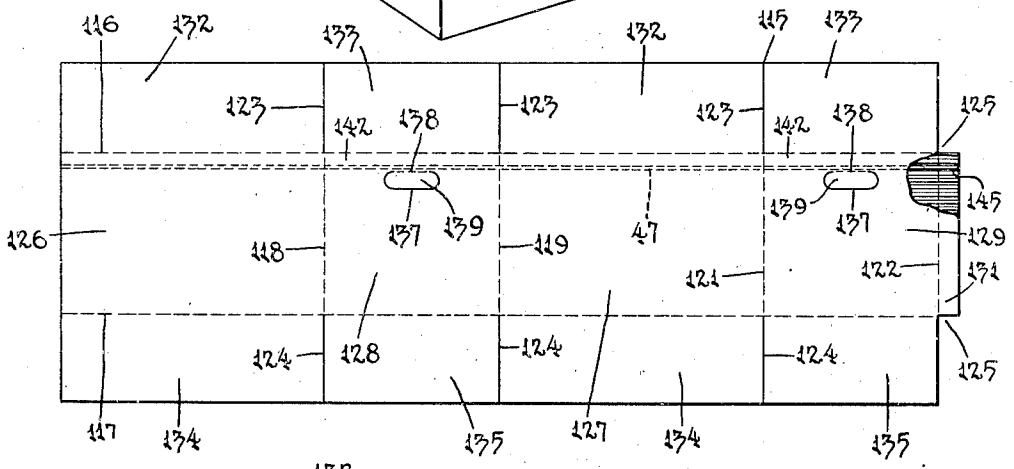


Fig. 5

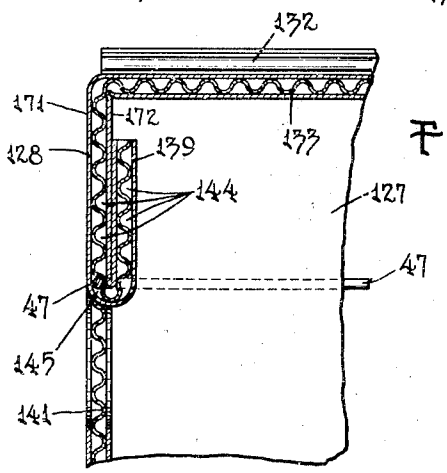


Fig. 6

Inventor

John H. Burr

By Caswell & Lagaard

Attorneys

Jan. 12, 1943. J. H. BURR 2,308,050

BOX

Filed April 12, 1940 4 Sheets-Sheet 3

Fig. 7

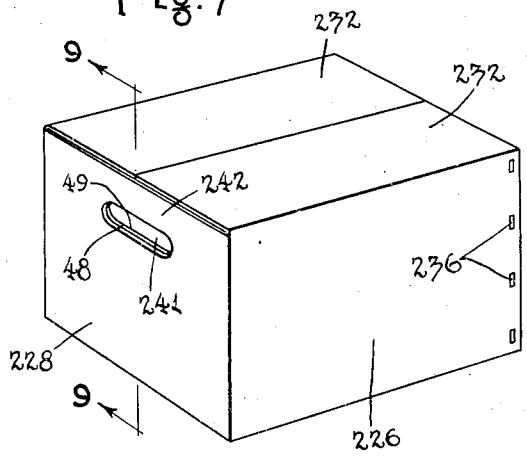


Fig. 9

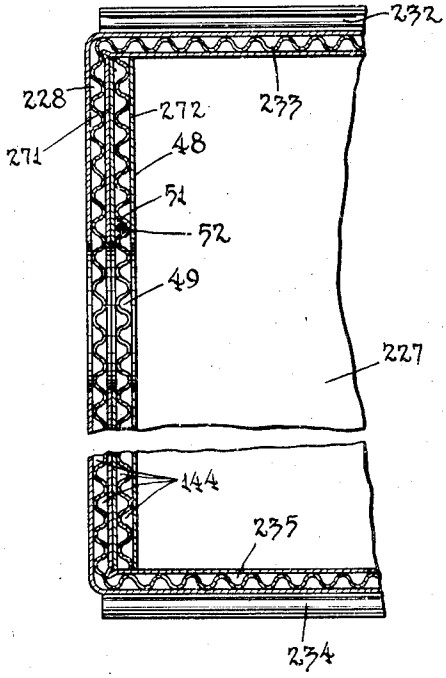


Fig. 11

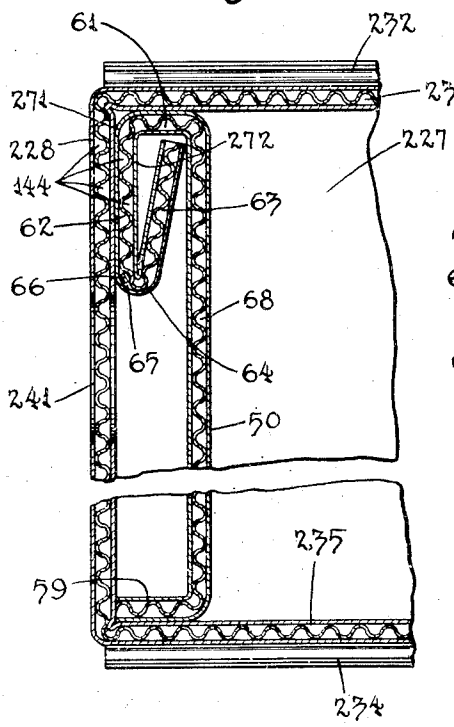


Fig. 10

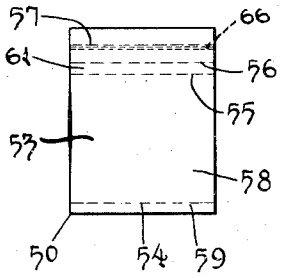
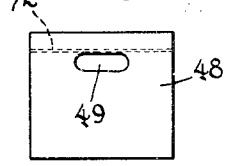


Fig. 8



Inventor

John H. Burr

By Caswell & Lagaard

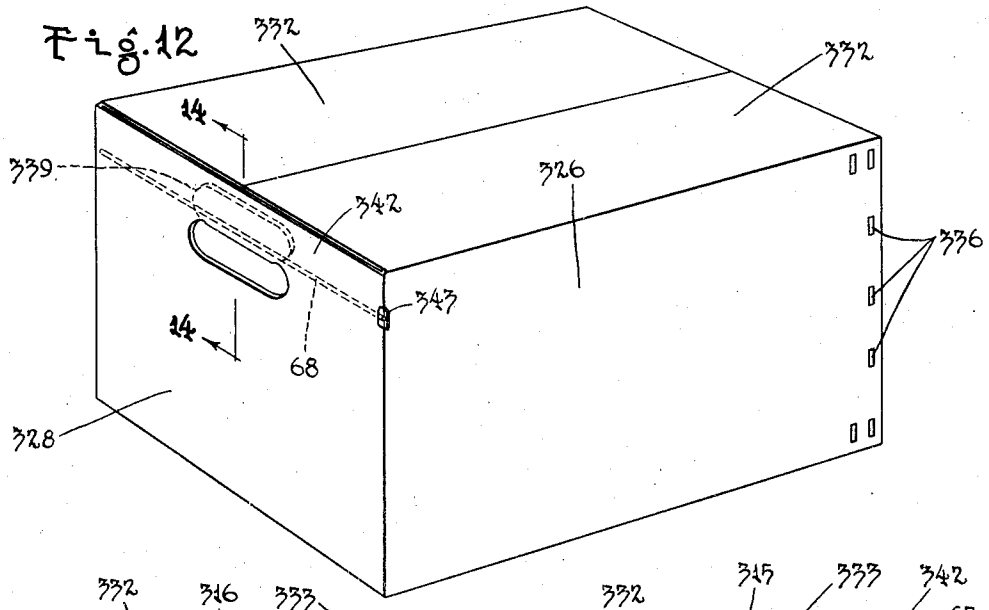
Attorneys

Jan. 12, 1943. J. H. BURR 2,308,050

BOX

Filed April 12, 1940 4 Sheets-Sheet 4

Fig. 12



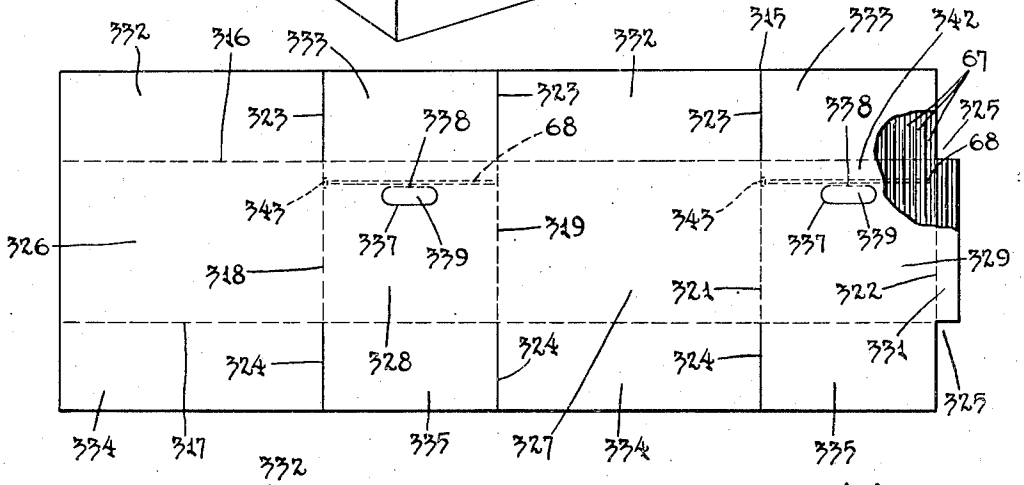


Fig. 13

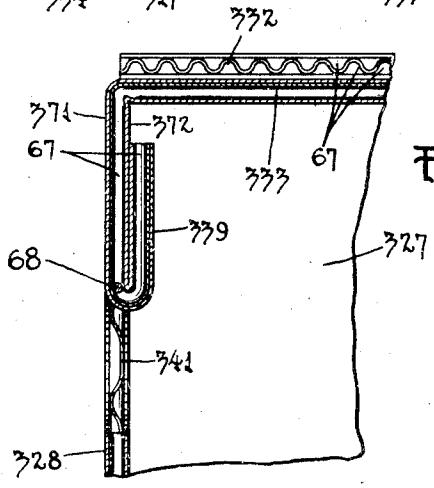


Fig. 14

Inventor

John H. Burr

By Caswell & Lagaard

Attorneys

Patented Jan. 12, 1943 2,308,050

UNITED STATES PATENT OFFICE

2,308,050

BOX

John H. Burr, St. Paul, Minn., assignor to Waldorf Paper Products Company, St. Paul, Minn., a corporation of Minnesota

Application April 12, 1940, Serial No. 329,274

1 Claim. (Cl. 229—52)

My invention relates to boxes and has for an object to provide an extremely rigid and substantial construction capable of carrying bottles or similar heavy articles.

Another object of the invention resides in providing a box having a hand hole in one end wall thereof into which the hand of the user may be inserted for lifting and carrying about the box, and in providing a reinforcing member for the portion of the end wall having the hand hole whereby relatively light material may be used for the construction of the box.

An object of the invention resides in constructing the box from double faced corrugated board and in utilizing a wire reinforcing member inserted between the faces of the board and disposed in proximity to the hand hole.

A feature of the invention resides in inserting the wire reinforcing member in one of the flutes of the corrugated board at the locality of the hand hole.

Another object of the invention resides in constructing the box with hand holes at the opposite end walls of the box and in providing a separate reinforcing member for each end wall of the box situated in proximity to the hand holes.

A feature of the invention resides in providing a wire reinforcing member extending continuously about all of the walls of the box and across the end walls of the box in proximity to the hand holes therein.

Another object of the invention resides in disposing the wire reinforcing member in the end wall of the box at a location immediately above the hand hole therein.

A still further object of the invention resides in providing an insert having a portion adapted to lie adjacent the hand hole in the end wall of the box and in disposing in said insert the wire reinforcing member.

A still further object of the invention resides in arranging the flutes of the corrugations so that the same extend vertically and in running the wire reinforcing member through all of the flutes and along the portion of the wall adjacent the hand hole therein.

Other objects of the invention reside in the novel combination and arrangement of parts and in the details of construction hereinafter illustrated and/or described.

In the drawings:

Fig. 1 is a perspective view of a box illustrating an embodiment of my invention.

Fig. 2 is a developed view of the blank from which the box shown in Fig. 1 is constructed and illustrating a portion of the same cut away to show the manner of applying the reinforcing members thereto.

Fig. 3 is a fragmentary elevational sectional view taken on line 3—3 of Fig. 1.

Fig. 4 is a view similar to Fig. 1 of a modification of the invention.

Fig. 5 is a developed view similar to Fig. 2 of the blank from which the box shown in Fig. 4 is constructed.

Fig. 6 is a fragmentary elevational sectional view taken on line 6—6 of Fig. 4.

Fig. 7 is a view similar to Fig. 1 of still another form of the invention.

Fig. 8 is a developed view of the insert used with the box shown in Fig. 7.

Fig. 9 is a fragmentary elevational sectional view taken on line 9—9 of Fig. 7.

Fig. 10 is a developed view similar to Fig. 8 of a blank from which a modified form of insert is constructed.

Fig. 11 is a view similar to Fig. 9 illustrating the application of the form of the insert disclosed in Fig. 10.

Fig. 12 is a perspective view similar to Fig. 1 of still another form of the invention.

Fig. 13 is a view similar to Fig. 2 of the blank from which the box shown in Fig. 12 is constructed.

Fig. 14 is a fragmentary elevational sectional view taken on line 14—14 of Fig. 12.

When corrugated paper board is used in the construction of boxes provided with hand holes in the end walls thereof, the corrugated board readily breaks and tears when the box is picked up by inserting the hand in one of the hand holes. The present invention provides a construction by means of which the portion of the wall of the box having the hand hole therein at the locality of the hand hole is sufficiently reinforced by an inexpensive construction so that the box may be handled without danger of tearing or breaking the wall structure thereof.

The box shown in Fig. 1 is constructed from a blank illustrated in Fig. 2 and indicated in its entirety by the reference numeral 15. This blank is provided with two longitudinal scores 16 and 17 and with transverse scores 18, 19, 21 and 22. The scores 18, 19, 21 and 22 extend between the scores 16 and 17. In addition to these scores the blank is sheared along lines 23 and 24 which are disposed in alignment with the scores 18, 19 and 21 and which extend outwardly beyond the scores 16 and 17 to the edges of the box. The corners of the blank, as designated at 25, are cut

away. By means of the various scores the box is divided into side walls 26 and 27, end walls 28 and 29 and an end wall flap 31. In addition, the upper side wall flaps 32, are provided with upper end wall flaps 33. Similarly lower side wall flaps 34 and lower end wall flaps 35 are formed which extend outwardly beyond the walls from which the same issue.

In the formation of the blank the flap 31 is secured to the side wall 26 by staples or wire stitches 36, as best shown in Fig. 1. In the erection of the box the flaps 34 and 35 are first turned inwardly and glued or otherwise secured together to form a bottom for the box. After the contents have been placed within the box the upper flaps 32 and 33 are similarly folded inwardly and secured to one another by glueing to form a closure for the box.

In the two end walls 28 and 29 are formed arcuate cuts 37 which are connected together by means of scores 38. These cuts and scores define tabs 39 which may be folded inwardly into the interior of the box. When the said tabs are so folded as shown in Figs. 1 and 3, hand holes 41 are formed in the end walls of the box which are disposed below the upper edges thereof. The portions of the end walls of the box above the hand holes 41 are designated by the reference numeral 42. In these portions of the end walls 28 and 29 are formed notches or openings 43 which communicate with the flutes 44 of the corrugations of the board. One of these flutes, designated by the reference numeral 45, is disposed immediately above the scores 38 and the notches 43 communicate with this flute. In this flute are inserted two rods or wire reinforcing members 46 which are of a length substantially equal to or slightly less than the width of the end walls 28 and 29. These wire members are confined to the portions 42 of said end walls and lie immediately above the hand holes 41 being disposed between the faces 71 and 72 of the corrugated board. When the box has been sealed and the tabs 39 pressed inwardly into the same the parts occupy the position shown in Figs. 1 and 3. It will be noted that the wire reinforcing members 46 lie in close proximity to the upper edges of the hand holes 41 and extend throughout the width of the end walls. By means of this construction the box, at the locality of the hand holes, is greatly reinforced.

When a box constructed in accordance with my invention is to be carried about, the tabs 39 are forced inwardly into the box as shown in Fig. 3. The hand may then be inserted through the hand hole 41 and the end wall grasped by the portion 42 thereof within the interior of the box. Due to the reinforcing member 46 this end wall is considerably stiffened and the entire box may be carried about without danger of tearing out the portion of the end wall above the hand hole 41.

In Figs. 4, 5 and 6 another form of the invention has been shown. In this form of the invention the manner of constructing the box is substantially the same as that shown in Figs. 1, 2 and 3 and the same reference numerals preceded by the digit 1 will be used to designate corresponding parts. In this form of the invention the notches 43 are dispensed with and a single reinforcing member 47 employed which extends throughout the entire length of the flute 145. When the box is erected the wire member 47 is folded at the corners of the box defined by the scores 18, 19, 21 and 22. This may be facilitated by weakening the said reinforcing member at the locality of the scores 18, 19, 21 and 22. This causes the reinforcing member to bend at the proper locality and provides a reinforcement extending about all of the walls of the box. With this form of the invention a tie is provided between one end wall of the box and the other so that when one end of the box is grasped the stresses are distributed to the other walls of the box and the possibilities of tearing the blank, from which the box is constructed, is thereby greatly reduced.

In Figs. 7 to 11 inclusive a modification of the invention is illustrated which utilizes an insert placed adjacent each end wall of the box and which carries the reinforcing member of the invention. The box shown in Fig. 7 being similar to that shown in Fig. 1, the description thereof will not be repeated and the same reference numerals preceded by the digit 2 will be used to designate corresponding parts.

In the box shown in Fig. 7 the tab indicated at 39 in Fig. 1, has been completely cut out of the box so that the hand hole 241 is clear. Along the inner surfaces of the walls 228 and 229 of the box is provided an insert 48 which is shown in detail in Fig. 8. This insert consists of a sheet of corrugated board in which the corrugations thereof extend lengthwise. This insert has a hand hole 49 formed therein which is adapted to register with the hand hole 241 when the insert is placed within the box. The corrugations of the insert 48 extend crosswise of the same and may be parallel with or at right angles to the corrugations of the bank from which the box shown in Fig. 7 is constructed. In Fig. 9 the corrugations of the box are shown as extending parallel with the corrugations of the blank. In the particular flute 51 of the insert 48 which lies immediately above the hand hole 49 in said insert, is disposed a wire reinforcing member 52, similar to the reinforcing member 46. The reinforcing members 52 serve the same purpose and operate to reinforce the box and prevent tearing out of the portions 242 of the end walls 228 and 229. With this form of the invention the box proper can be constructed in the conventional manner and the special feature of the invention incorporated in a seperate insert, insertable into the box at the time of filling the same.

Another form of insert which may be used with the box, shown in Fig. 7, is illustrated at 50 in Figs. 10 and 11. This insert is constructed from a blank 53 of corrugated board scored at 54, 55, 56 and 57. By means of the various scores a body portion 58 is provided of dimensions corresponding to the dimensions of the end walls 228 and 229. When the said blank is folded along the said scores a flange 59 is formed at the lowermost portion of the body 58 which engages the end wall of the box and holds the blank spaced therefrom. A similar flange 61 is formed at the uppor portion of the body 58 which lies along the flap 233 of the box. In addition a flap 62 is provided which extends downwardly from the flange 61 and an upwardly extending flap 63 is formed which lies between the flange 62 and the body 58. The precise arrangement of these parts is shown in detail in Fig. 11. It will be noted that, due to the score 57, a rounded corner 64 is formed between the flaps 62 and 63 and which faces downwardly. The length of the flap 62 and 63 is such that the corner 64 becomes disposed at the upper edge of the hand hole 241.

In the flute 65 of the insert 50 situated at the rounded portion 64 thereof is disposed a wire reinforcing member 66, similar to the reinforcing

member 52. This member extends throughout the length of the flap 62 and lies adjacent the portion 242 of the walls 228 and 229 of the box. This reinforcing member serves the same purpose as the reinforcing member 52 and operates in the same manner.

In Figs. 1 to 11 the flutes of the corrugations have been illustrated as extending in a horizontal direction. When the box is so constructed the same has less rigidity for supporting weight placed thereon but gives greater strength toward resisting tearing when the end wall is grasped through the hand hole therein. It frequently becomes desirable to produce a box having greater weight sustaining characteristics by running the flutes vertically. Such a box has heretofore been entirely too weak to permit of the use of hand holes. By the use of my invention the wire reinforcing member may be applied to such a box to stiffen and reinforce the same.

In Figs. 12 to 14 I have shown a box in which the flutes run vertically instead of horizontally. Otherwise the construction shown in Figs. 12 to 14 is identical with that shown in Figs. 1 and 2. For this reason the description thereof will not be repeated and the same reference numerals preceded by the digit 3 will be used to designate corresponding parts.

It will be noted in Fig. 13 that the various flutes 67 of the corrugated board from which the box is constructed run vertically. At a locality shortly above the score 338 in each of the end walls 328 and 329 is provided a wire reinforcing member 68 which pierces the walls of the various flutes and extends completely across the end walls of the box. This wire reinforcing member is inserted into the blank through suitable notches 343, similar to the notches 43 disclosed in the form of the invention shown in Figs. 1 and 2. By means of this construction the wire reinforcing member is easily inserted into the corrugated board. To facilitate such insertion the entering end of the wire reinforcing member may be sharpened and when such is the case the two facings of the board maintain the wire member within the board.

The advantages of my invention are manifest. The invention can be applied to boxes constructed from corrugated board and without materially altering or changing the construction thereof. The invention is extremely simple and practical in construction and can easily be applied to the box. My invention may be used not only to give strength to the ends of the box having the hand holes therein, but may be used to tie together the various walls of the box to distribute the stresses throughout the same. If desired, the invention may be used in conjunction with an insert disposed within the box and applicable as a separate unit therein. Since my invention utilizes reinforcing members of wire, such reinforcing members do not materially add to the cost or weight of the box.

Changes in the specific form of my invention, as herein disclosed, may be made within the scope of what is claimed without departing from the spirit of my invention.

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

In a box having a wall constructed from corrugated board, said board being arranged to cause the flutes to extend transversely of the wall, said wall having a horizontal cut and vertical cuts connected therewith to form a tab adapted to be bent into the box along one of the flutes to form a bight between said tab and wall and to provide a hand hole in the box with a rounded edge at the upper portion of the hand hole and along said bight and a rod extending through a flute of said wall of the box within the bight and following along the rounded edge of said bight, said rod serving to reinforce and prevent the portion of the wall above the hand hole from tearing away from the wall, said rod further serving to restrain shifting of the portion of the wall at the bight out of the plane of the wall.

JOHN H. BURR.