

June 22, 1965

A. R. D'ANDREA ET AL
RECEPTACLE HAVING MEANS FOR PROVIDING A POUR
OPENING IN A WALL THEREOF

3,190,485

Filed Oct. 19, 1961

5 Sheets-Sheet 1

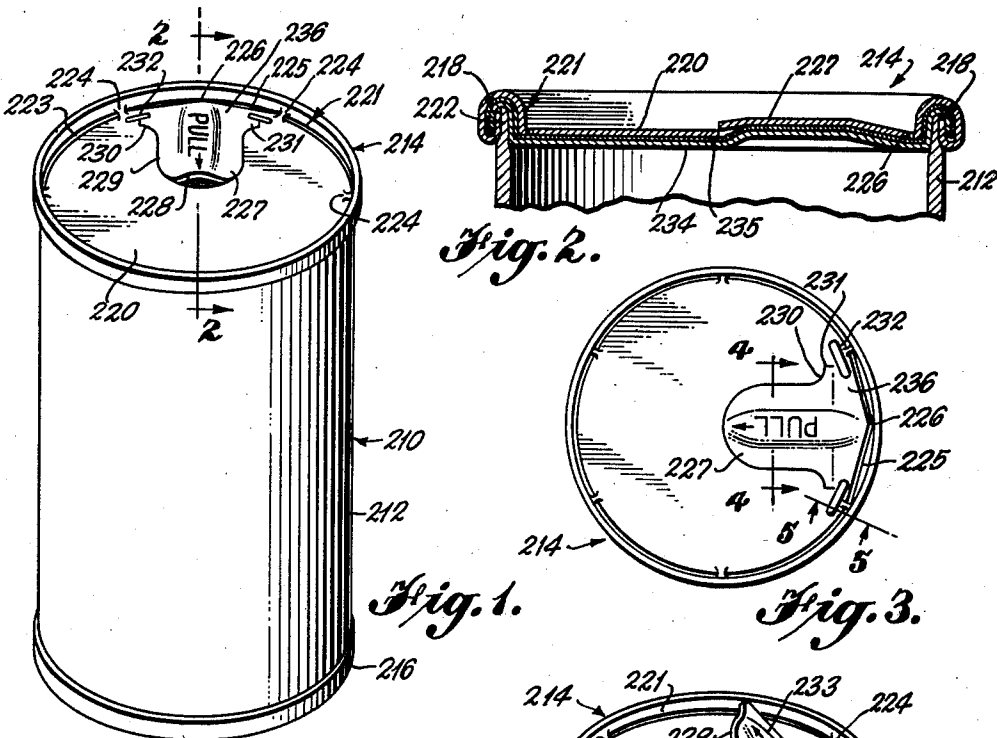


Fig. 2.

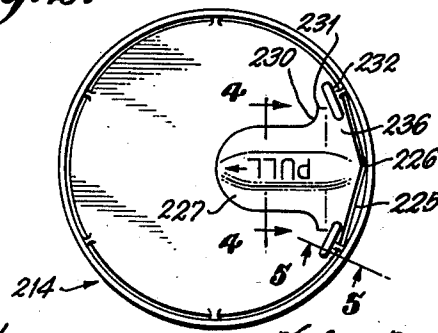


Fig. 3.

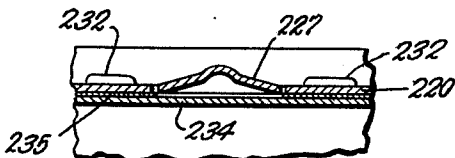


Fig. 4.

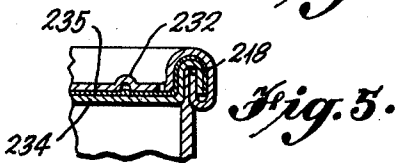


Fig. 5.

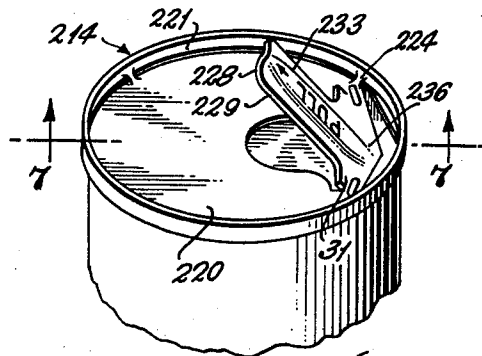


Fig. 6.

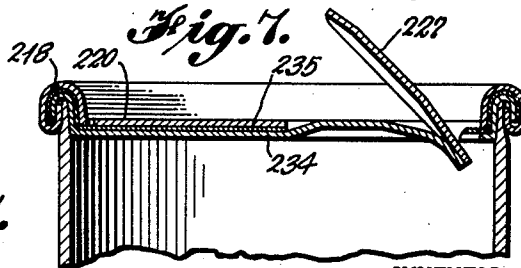


Fig. 7.

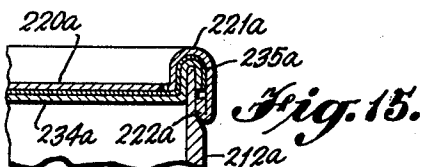


Fig. 15.

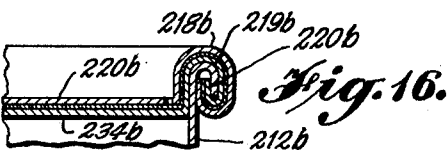


Fig. 16.

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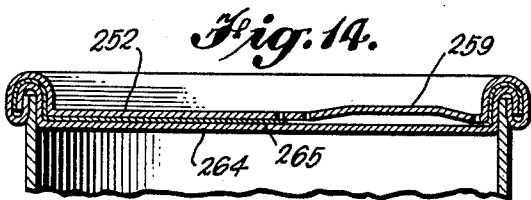
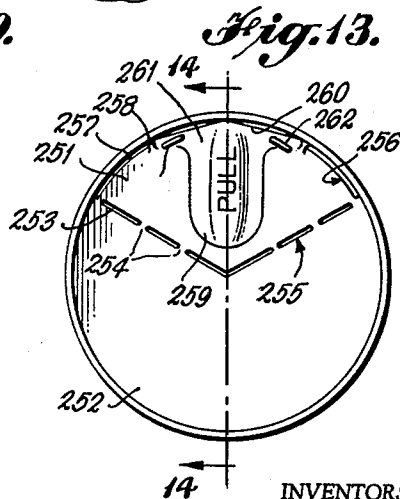
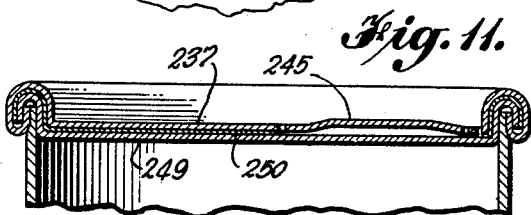
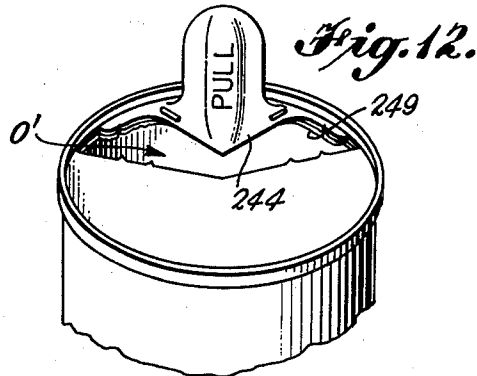
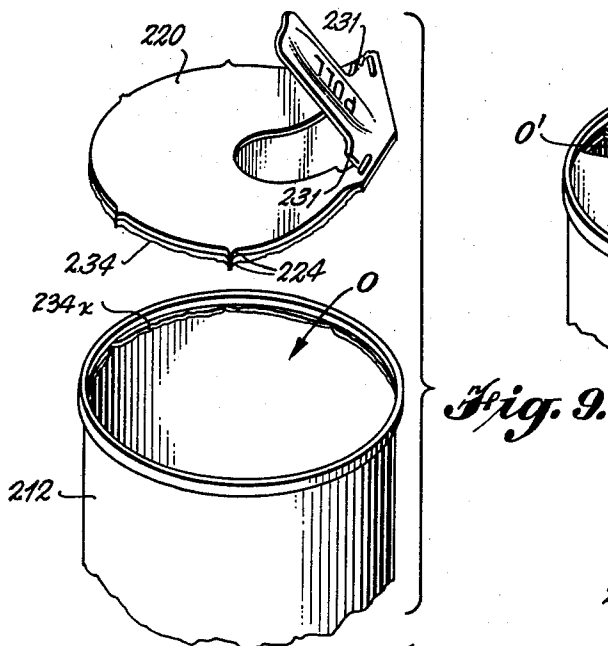
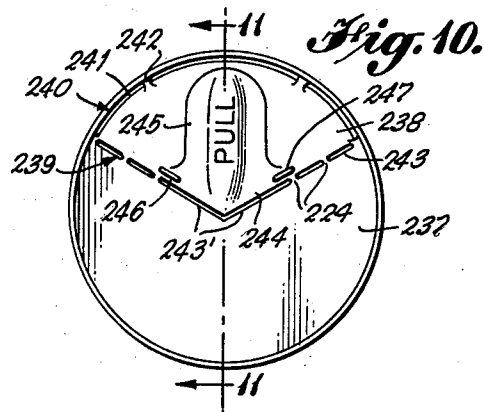
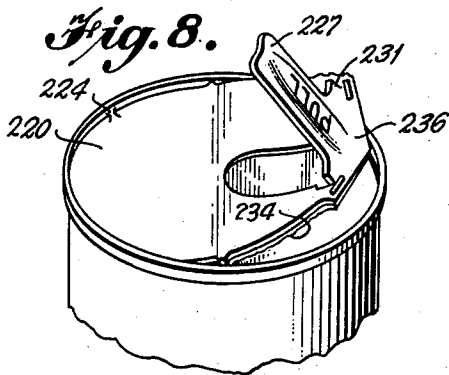
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Fig. 17.

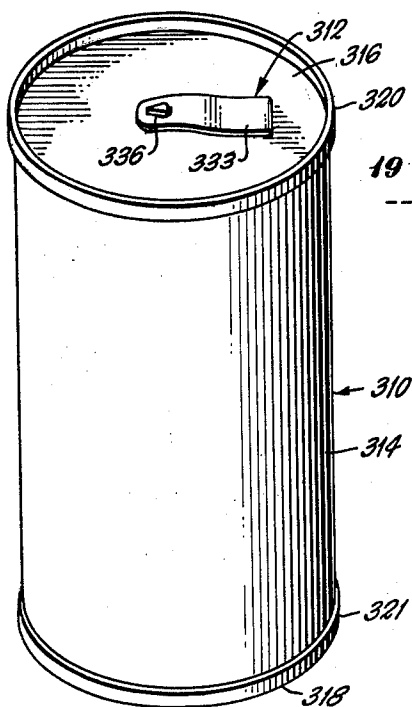


Fig. 18.

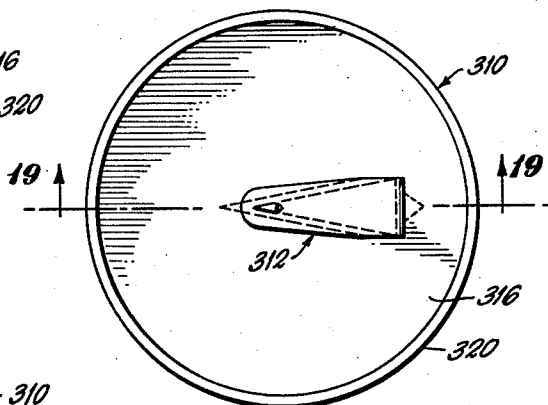


Fig. 21.

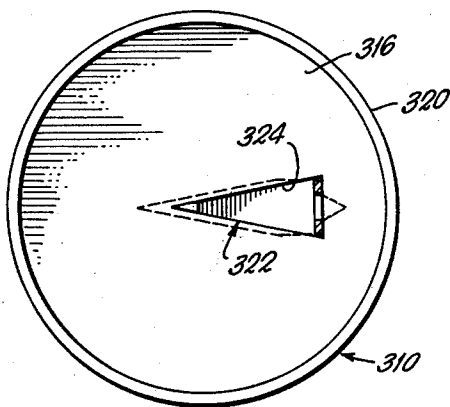
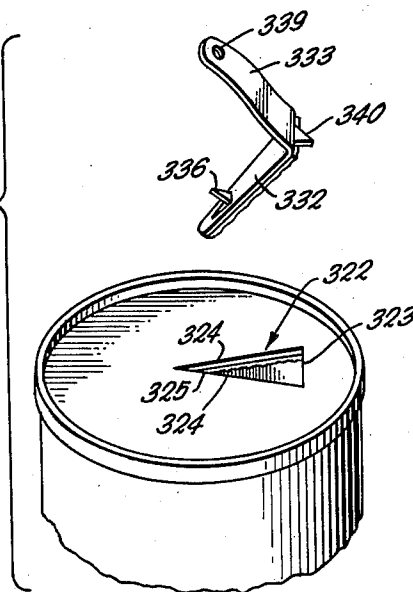


Fig. 23.



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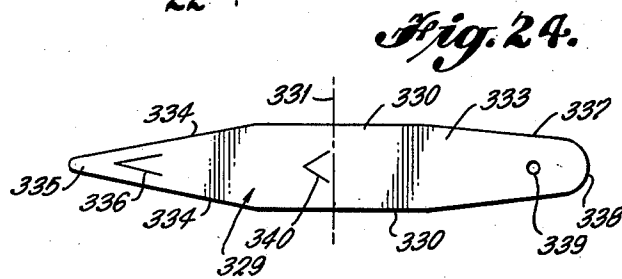
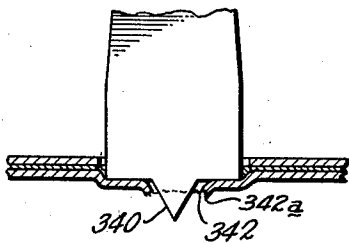
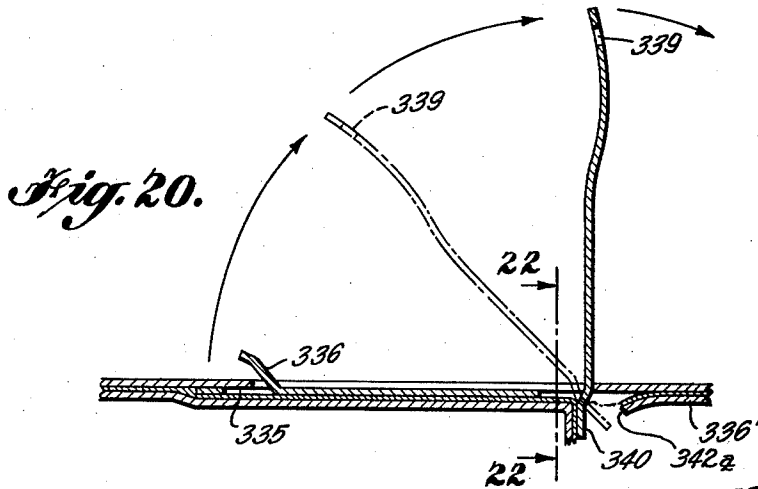
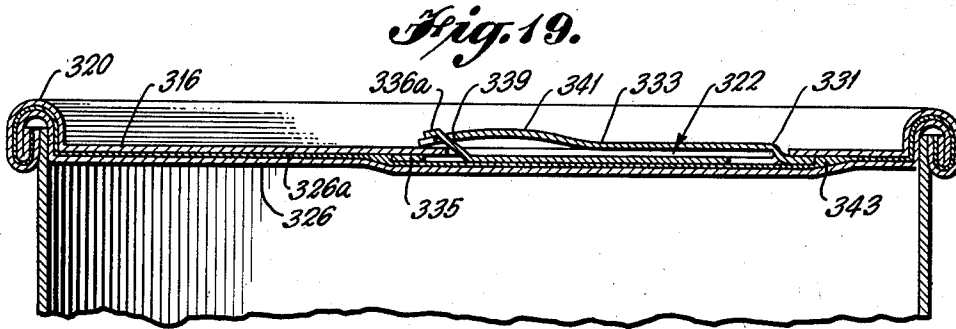
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Fig. 25.

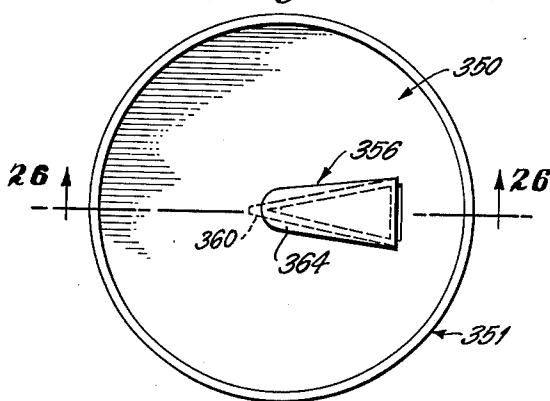


Fig. 30.

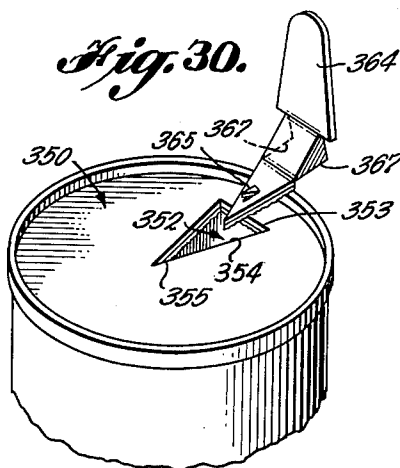


Fig. 26.

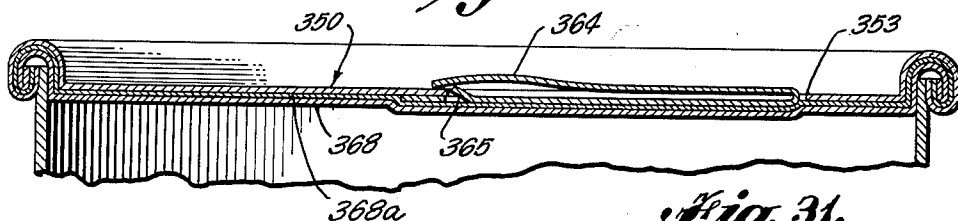


Fig. 27.

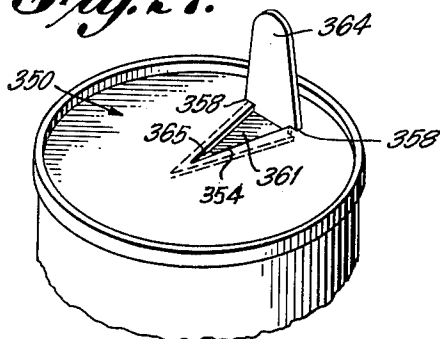


Fig. 31.

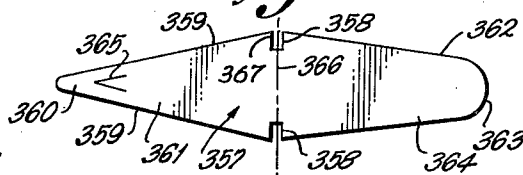


Fig. 29.

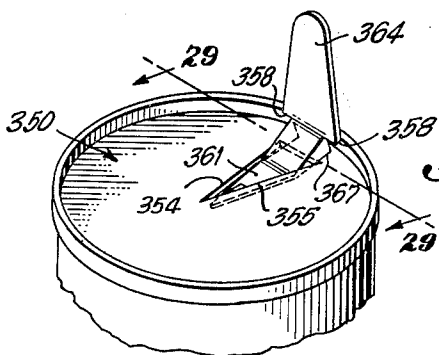
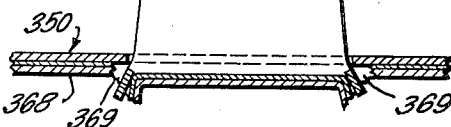


Fig. 28.



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RECEPTACLE HAVING MEANS FOR PROVIDING A POUR OPENING IN A WALL THEREOF

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18 Claims. (Cl. 220—48)

This application is concerned with a container which can be opened by hand without a tool and having a frangible sheet on the inner side of the wall of the container. In the previously known containers of this kind, it has been necessary to remove a part of the wall and afterwards to fracture and remove part of the frangible sheet, which means that the user has to carry out two different operations in order to provide a pour opening for removing the contents of the container.

The object of this invention is to provide an improved container by which the user will be able to open the container with a single operation, and in accordance with the invention, this is obtained thereby that a pull tab capable of being grasped by human fingers, is attached to or integral with said wall, the frangible sheet being wholly or partly attached to a part connected to the pull tab so by removing said part from the wall, the frangible sheet is broken and removed simultaneously.

By carrying out the container invention in the manner described, it is made possible for the user of the container to open the container and provide a pour opening with a single operation, the user simply grasping the pull tab and applying a pull to the tab and thereby to the removable part so that the frangible sheet attached thereto will be fractured and removed together with said part whereafter the container will be ready for pouring out the contents of the container.

In the preferred embodiment of the invention, the part to be removed with the pull tab is provided with means for immediately fracturing the frangible sheet at the beginning of the removing of said removable part thereby facilitating the removal of the removable part and the frangible sheet so that also the force to be used will be reduced.

In order to assure that the function of the fracturing means will take place without any special operation or without any particular force to be carried out by the user, the container invention may, in accordance with the invention, be carried out in such a way that said fracturing means are attached to or integral with the pull tab, which means that the immediate fracturing will be carried out as soon as the pull tab is grasped by human fingers and pulled in a direction away from the container.

The removable part may be provided in various manners, but in a preferred embodiment of the invention, the pull tab is securely attached to or integral with a part of the wall defined by a weakening line in the wall, said weakening line also defining an opening to be provided in the wall, the frangible sheet being wholly or partly attached to said part of the wall. Said part of the wall could preferably be a part of the top of the container, the weakening line defining an opening of sufficient size in order to easily remove the contents of the container, and due to the fact that the frangible sheet is attached to said part of the wall, the part of the wall as well as the frangible sheet would be removed over the whole area and providing in a single operation the necessary opening in the container wall.

The container wall may be cut out in such a manner that the wall has a pre-formed opening covered by a protection member, said member being provided with a

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pull tab, and in accordance with the invention, a container of such kind might be carried out in such manner that the frangible sheet is wholly or partly attached to the protection member, thus obtaining that by removing the protection member, the frangible sheet will simultaneously be removed over an area corresponding to the area of the protection member.

The frangible sheet may be attached to the part to be removed in various manners, but preferably it is attached by means of a suitable adhesive. By attaching the frangible sheet to the part to be removed, a further advantage is obtained thereby that in the production of the container, the part of the container in which the opening has to be provided, for instance, the lid of the container, will be handled as a unit, thereby simplifying the operation during the manufacturing of the container. It will be understood that normally the frangible sheet will be fractured in such a manner that only a part of the frangible sheet corresponding to the area of the part to be removed will be removed from the container and some parts of the frangible sheet placed below the remaining part of the wall will be maintained in the container.

In the drawings:

FIG. 1 is a perspective view of a cylindrical receptacle illustrating a first embodiment of the opening means of the present invention in which the entire end wall is removable with the underlying frangible sheet.

FIG. 2 is a sectional view on an enlarged scale taken substantially on the line 2—2 of FIG. 1.

FIG. 3 is a top plan view of the receptacle shown in FIG. 2.

FIG. 4 is a fragmentary section taken substantially on the line 4—4 of FIG. 3.

FIG. 5 is a fragmentary section taken substantially on the line 5—5 of FIG. 3.

FIG. 6 is a perspective view illustrating the first stage in the operation of opening the receptacle by means of the pull tab.

FIG. 7 is a sectional view taken substantially on the line 7—7 of FIG. 6.

FIG. 8 is a perspective view illustrating a further stage in the operation of opening the receptacle.

FIG. 9 is an exploded view illustrating in perspective the open top of the receptacle and the removed top portion thereof which carries with it the underlying frangible sheet leaving an outer peripheral portion of the latter in the can seam.

FIG. 10 is a top plan view of a receptacle showing another embodiment of the invention wherein a segmental portion of the can wall and attached frangible sheet is removable by the pull tab.

FIG. 11 is a sectional view taken substantially on the line 11—11 of FIG. 10.

FIG. 12 illustrates the primary stage of removing the sector portion of FIG. 10, by means of the pull tab.

FIG. 13 is a view in top plan of a can or like receptacle illustrating a reversed arrangement of the tab and sector portion of FIG. 10 to be removed by the tab.

FIG. 14 is a sectional view taken substantially on the line 14—14 of FIG. 13.

FIG. 15 is a fragmentary view of a portion of a can side wall and end wall showing another conventional means of effecting a fluid tight sealing between the metal of the end wall and the side wall where the latter is formed of paperboard.

FIG. 16 is a fragmentary view similar to FIG. 15 and showing the conventional rolled seam for joining the metal side and end walls together.

FIG. 17 is a view in perspective of a cylindrical receptacle showing another embodiment of opening means of the present invention.

FIG. 18 is a top plan view on an enlarged scale of the structure of FIG. 17.

FIG. 19 is a sectional view on an enlarged scale taken substantially on the line 19—19 of FIG. 18.

FIG. 20 is a sectional view corresponding to the section line of FIG. 19 but on a still larger scale and showing in two stages the action of the opener of FIG. 17 in the operation of opening or uncovering the pour opening and removing the attached portion of the frangible sheet.

FIG. 21 is a top view corresponding to FIG. 18 but showing the outer leg of the opener cut away where it joins the inner leg.

FIG. 22 is a sectional view taken substantially on the line 22—22 of FIG. 20.

FIG. 23 is an exploded view illustrating the condition of the opener of FIG. 17 following its removal from the can wall with the attached portion of the cover sheet.

FIG. 24 is a developed view of the opener device of FIG. 17.

FIG. 25 is a view in plan showing still another embodiment of the opener device of the present invention.

FIG. 26 is a sectional view on an enlarged scale taken substantially on the line 26—26 of FIG. 25.

FIG. 27 is a view in perspective illustrating the first stage in manipulating the opener device shown in FIG. 25 for its removal with the underlying sealing sheet.

FIG. 28 is a view in perspective illustrating a further step in removing the opener of FIG. 25.

FIG. 29 is a sectional view taken substantially on the line 29—29 of FIG. 28.

FIG. 30 is an exploded view illustrating the condition of the opener of FIG. 25 as it leaves the can opening together with the attached portion of the sealing sheet.

FIG. 31 is a plan view of the developed opener of FIG. 25.

Referring now more particularly to the drawings which illustrate different novel embodiments of the invention by means of which a user of the improved container is able to open the latter in a single operation, attention will be first directed to FIGS. 1 to 16.

In these figures, it will be seen that a can or other container may be opened by means of a pull tab when grasped by human fingers, and which tab is attached to a removable part of the container wall and when the tab is raised, a frangible sheet underlying and secured to such part of the wall, will be punctured and will be removed in one movement, with the wall part.

In the structure illustrated in FIGS. 1 to 16, the receptacle body is generally designated 210 and is shown as having the side wall 212 and the end closures 214 and 216.

Where the receptacle is formed of metal, the end closures may be connected with the ends of the body wall 212 by a conventional rolled seam or if the receptacle body should be constructed of a fiber or the like, the end walls may be formed of suitable metal and joined to the ends of the body by conventional pressed seam such as is here illustrated and designated 218.

In carrying out the invention, one wall, here designated 214 and illustrated as an end wall of the receptacle, formed of metal, embodies a flat disc-like central portion 220 which is joined to the end edge of the body 212 by the illustrated seam which, while shown as a pressed seam, may also be in the form of the rolled or interlocked seam which is conventionally used in all metal can construction. This seam forms the inner flange portion 221 with which the central portion 220 forms the substantially right angle as is clearly shown in FIG. 2.

The entire end wall 214 is stamped or pressed as an integral one-piece unit from a sheet of metal or other suitable material and in the required size to cover the end of the receptacle body and in the pressing operation it is shaped to form the disc-like center portion encircled by the right angle flange 221, a portion of which, in the operation of connecting the end wall with the side wall, may be turned or rolled under on the outer side of the side

wall and such rolled or turned under portion and the inner part of the flange pressed together to squeeze or grip the end edge of the wall therebetween to form a fluid tight joint as indicated at 222. This connection is one of the conventional types of seam which is employed for joining a metal end wall with the edge of a side wall formed of fiber or fiber composition or paperboard. It will be understood that while the illustration of this seam between the walls suggests that the flange is very thick and accordingly would provide an outside shoulder against which the drive wheel of a rotary drive type can opener might bear, such apparent thickness results from the necessity of exaggerating the thickness of the folded material for the purpose of clarity, whereas in actual fact the seam would be very thin and flat since the folded together materials are themselves very thin and thus no shoulder of sufficient thickness to be engaged by the can opener drive wheel would be obtained. This is particularly true where a paperboard can wall is employed.

The disc portion 220 which lies inside of and is encircled by the flange portion 221 is weakened along a line close in the angle or corner formed between the disc and the flange 221, through substantially the entire circumference of the disc, such weakening line here being illustrated as being produced or effected by a discontinuous or interrupted slit consisting of portions 223 alternating with uncut or unslit portions 224. As shown, the uncut portions 224 are of very small, even minute, extent as compared with the extent of the cut portions 223 so that the disc-like central portion 220 is readily torn out or separated from the surrounding flange 221.

While the weakening line has been shown and described as a slit, it may also consist of a partial, or incomplete, cutting through of the metal of the wall.

While the slit portions 223 follow the curvature of the flange 221 through the major portion of the circumference of the disc-like head portion 220, one of the slit portions, instead of being arcuate, consists of two straight parts 225 which lie between two joining or unslit portions 224 and define an obtuse angle. The two parts 225 of this angulated slit intersect in the formation of the obtuse angle to form a cutting point 226.

In this embodiment of the invention thus far described, it will be apparent that the entire disc-like portion or head of the receptacle is intended to be removed in the operation of opening of the receptacle. To facilitate such removal, the disc-like portion 220 is cut or stamped to form a pull tab 227 which has a free end edge 228 lying adjacent to the center of the portion 220 and which free end merges into the side edges 229 which extend outwardly toward the periphery of the portion 220 and terminate in the lateral extensions 230. These lateral extensions terminate adjacent to the outer ends of the parts 225 of the angular slit and are also relatively close to the adjacent uncut portions 224 so that the tab 227 is joined to the disc-like portion 220 by the side ears 231.

Each of these side ears of the tab 227 is reinforced by a short outpressed rib 232 of the metal which lies between a laterally extending portion 230 of the slit at the attached end of the tab and an unslit connecting portion 224 between the disc portion 220 and the flange 221.

In order to facilitate grasping the pull tab 227, the latter is longitudinally bowed outwardly or ribbed as at 233 so that, as shown in FIG. 1, a portion of the end edge 228 lies slightly above the top surface of the disc-like portion 220. Instead of forming the pull tab with the rib 233, the free end of the tab may be made to lie in the plane of the portion 220 and the tab may be given a slight arcuate bow outwardly sufficient to elevate portions of the edges 229 above the top of the portion 220, to facilitate grasping the tab by means of the fingers of a hand.

The end wall 214 is covered on its inner or under side by a sheet 234 of a frangible material, preferably aluminum foil, although such sheet may consist of any suit-

able plastic which would be unaffected by the contents of the receptacle and this sheet of frangible material is rolled or folded into the seam 218 as here illustrated, or as shown in FIGS. 15 and 16, to form a tight or hermetic connection with the end edge of the receptacle wall.

The frangible sheet 234 thus completely covers all of the weakening line, described as slits, to prevent leakage of the receptacle contents and to prevent the entrance of air into the receptacle.

In the assembling of the end wall, the frangible sheet 234 is attached to the inner or under side of the wall by a suitable means, and as an illustration of such means there is designated by the numeral 235, a layer of adhesive applied to the inner surface of the sheet of metal from which the disc portion 220 and the surrounding flange are formed, or to the frangible sheet. This adhesive may also be applied to the under side of the pull tab 227 although this is not essential.

In addition to preventing leakage through the weakened slits of the end wall or receptacle or the entrance of air into the receptacle where the receptacle may be formed throughout of metal and the end wall joined to the side wall by the conventional can rolled seam, the foil sheet liner will reinforce the weakened end wall to withstand any pressure which might develop and be exerted thereagainst from within the receptacle.

From the foregoing description, it will be seen upon reference to the several FIGS. 3, 7, 8 and 9, that the pull tab will function both to cut a portion of the frangible sheet, when the tab is bent outwardly as in FIG. 3, and also facilitate the pulling out of the disc portion 220 of the wall. In other words, in the operation of opening the receptacle, the inner end edge 228 of the tab is lifted either by the fingernail or in any suitable manner so that the tab can be grasped by the fingers and rocked to the position shown in FIG. 3. This will effect a torsional twisting of the connecting or hinge portions 231 between the sides of the tab at the attached end thereof so that the portion of the tab adjacent to the rim will be rocked down into the receptacle. This portion which turns down into the receptacle and which is outlined along its free edge by the convergent slits 225, in effect constitutes a puncturing or cutting blade which is generally designated 236.

Following the pulling up of the tab to rock or bend or twist the metal in the hinge portions 231, a continuing outward pull on the tab will result in the rupturing first of the uncut or connecting portions 224 immediately adjacent to the hinge portions 231 so that the disc portion 220 will begin to pull out or bend outwardly as illustrated in FIG. 8 and further continuing outward pulling will result in the complete removal of the disc-like portion 220 as shown in FIG. 9, together with the part of the frangible sheet attached to the under side thereof and while this description of the action of removing the pull out portion 220 and the attached part of the frangible sheet would seem to suggest that an appreciable time is taken in which to complete the operation, actually the action following the raising of the tab 227 can be carried out in an instant by the application of a quick jerk to the tab.

The frangible sheet of foil 234, being firmly attached to the disc portion 220, it will be seen that as the disc portion when pulled will be broken away at the locations 224, the foil or frangible sheet will also be torn along the lower edge of the flange portion 221 so that all of the foil lying beneath the disc portion will come out with the latter as shown in FIG. 9.

As illustrated in FIGS. 5 and 7 particularly, the slits 223 are close in the angle between the surface of the flange 221 and the portion 220. Thus, when the disc portion and the frangible sheet are torn away, no rough edge of metal will be left which would be likely to cause injury to a person handling a receptacle or drinking from it. In the tearing and removal of the frangible sheet, a

portion thereof below the remaining part of the wall will be maintained in the container, as indicated at 234x.

FIGS. 10 to 14 illustrate further embodiments of the invention whereby the removed portion of the end wall and the foil or frangible sheet attached to the under side thereof, may be extracted together in one quick operation. In FIGS. 10, 11 and 12, the disc-like wall portion of the receptacle is designated 237. Here a sector of the disc is outlined for removal, which sector is designated 238. The radial border lines of the sector are designated 239 and the included arc or curve of the sector is designated 240 and it is along these lines 239 and 240 that the sector is weakened so that it may be broken away from the disc portion of which it forms a part. The curved border designated 240 consists of the arcuate slits 241 alternating with the unbroken connecting portions 242. The connecting portions attaching the sector to the wall flange and the arcuate slits are located close in the angle between the flange, corresponding to the flange 221, hereinafter referred to, and the flat sector portion 238 of the end wall disc.

The radial borders or lines designated 239 also comprise short slits 243 alternating with unbroken connecting portions 244.

The radial borders of the sector from the point of their intersection outwardly through a part of the length thereof are represented by the relatively long slits 243' which also define the pointed blade portion 244 of the pull tab 245 which is stamped from the metal of this sector portion. As in the previously described construction, the sides of the pull tab terminate at a point short of the slits 243', leaving the bendable hinge portion 246 and this hinge portion is reinforced by the outpressed rib 247 which, when the pull tab is raised and pulled outwardly, prevents the metal from tearing through into the adjacent slit. With this construction, it will be seen that when the tab is pulled upwardly as shown in FIG. 12, the pointed or blade end 244 will swing downwardly and cut into the underlying frangible sheet or foil body 249. This sheet, as in the first described structure, is disposed against the under side of the disc portion of the wall and may be secured to the entire inner surface of this portion or secured only to the sector portion 238, the securing means here being shown as adhesive which is designated, in FIG. 11, by the numeral 250. Accordingly, a quick outward pull applied to the tab 245 will effect the instantaneous release of the part 238 together with the attached foil.

FIGS. 13 and 14 illustrate a reversed arrangement of the pull tab in the removable sector, from that shown in FIGS. 10 to 12, the construction being otherwise the same.

In FIGS. 13 and 14, the removable sector is generally designated 251, and forms a portion of the disc wall 252 of the receptacle. The radial borders, consisting of the alternating slits 253 and unbroken short portions 254 of the metal, are designated 255. The included arc between the inner ends of the radiating borders is generally designated 256 and is defined by the short arcuate slits 257 alternating with the shorter connecting portions 258. These slits 257 follow the arcuate contour of the rim of the receptacle. The pull tab here is generally designated 259 and has its free end adjacent to the center of the end wall or adjacent to the converging ends of the border portions 255 of the sector, while the opposite end of the pull tab is defined by the straight convergent slits 260 which form the cutting point 261 for the pull tab.

The side edges of the pull tab terminate short of the convergent edges 260 so as to provide the unbroken hinge portion 262 which is reinforced by the short ribs 263 separating the end portions of the sides of the tab from the convergent blade edge forming slits 260.

It will be understood, of course, that the inner or under side of the disc portion 252, which includes the sector 251, is covered by the frangible sheet 264 as in the other constructions, which frangible sheet is attached or secured by

suitable means, either to the removable sector portion 251 alone or it may be secured to the entire under surface of the end wall. An adhesive coating which may provide such attaching means is generally designated 265.

In the first described embodiment of the invention, the removal of the entire disc portion 220 and the attached underlying portion of the frangible sheet provides the pour opening generally designated O and which includes the entire area of the end wall of the receptacle while in the embodiments shown in FIGS. 10 to 14, the removal of the sector portion and the attached underlying portion of the frangible sheet 249 or 264 provides a pour opening which, in FIG. 12, is generally designated O' and which includes only a portion of the end wall of the receptacle.

FIGS. 15 and 16 illustrate the ways in which the end wall of a receptacle carrying a pull out portion in accordance with the present invention, may be secured with the underlying foil to the side wall of the receptacle.

In FIG. 15, the side wall of the receptacle is generally designated 212a and the end wall or disc portion carrying the pull out section, is designated 220a, while the underlying foil is designated 234a.

As shown here the foil 234a is bent or folded over the top edge of the side wall 212a as indicated at 235a and the flanged edge of the disc portion 220a is also folded over as at 221a and has a small inturned free edge portion 222a which extends upwardly and is in opposed relation with the edge of the folded part or portion 235a of the foil and these folded portions are then compressed tightly to grip the top edge of the wall 212a therebetween. Thus, with this arrangement it will be seen that there is no outside shoulder provided by the flanged perimeter of the receptacle wall with which a toothed rotary drive wheel of a rotary type can opener may engage.

In FIG. 16 the seamed connection between the receptacle end wall portion which carries the pull out section and the underlying foil are joined with the top edge of the receptacle side wall by a rolled seam such as is commonly employed in the construction of all metal cans. Here the metal side wall of the receptacle is designated 212b, while the disc portion of the end wall which is provided with the pull out section is generally designated 220b and the underlying foil sheet is designated 234b.

The seam formed by rolling the peripheral portion of the wall 220b and foil 234b with the side wall 212b is generally designated 218b and as will be seen, the top edge of the wall 212b is rolled down as at 219b and the peripheral portions of the wall 220b and frangible sheet 234b are rolled in under the turned down edge portion 219b as indicated at 220b and all of the parts are pressed tightly together to form a hermetic seal.

FIGS. 17 to 24 illustrate other ways of realizing the desired objects of the present invention. In these embodiments, the distinction from the preceding structures lies in the fact that the container or receptacle wall is primarily formed with a pour opening and the device which is grasped by the fingers and manipulated to open the container, is located in a position with respect to the opening to cover and close the same.

Referring more particularly to FIGS. 17 to 24, the container or receptacle 310 is shown as being of the cylindrical can type, the side wall of the container being designated 314 and the ends being designated 316 and 318.

The end walls are joined to the side wall by the conventional rolled seam 320 and 321.

One end wall, here shown as the wall 316 has therein a triangular pour opening 322, the base portion 323 of the opening lying adjacent to the rim while the convergent sides or side edges 324 of the opening join to form the apex 325 adjacent to the center of the wall.

The numeral 326 designates a sheet of frangible material, preferably aluminum foil, which is here illustrated as being coextensive with the wall 316 against the inner side of which it is positioned, whereby the periphery or

edge portion 327 of the foil is tightly joined or rolled into the beaded or seamed edge 320.

The opener device 312 is a protection device for the foil and is formed, as illustrated in FIG. 24, from a single strip or band 329 of ductile metal which is adapted to be folded and which may also be unfolded or bent without breaking.

The band of material 329 has a central or middle portion which is bounded by the parallel edges 330 and the width of the band between these edges is only slightly less than the length of the base edge 323 of the pour opening. This band is adapted to be folded transversely at approximately midway between its ends along the line 331 to provide the two inner or lower and upper or outer leg portions 332 and 333, respectively, which are brought into overlying or juxtaposed relation when the opener is fitted to the can wall 316 in closing relation with the opening 322.

The inner leg portion 332 includes a part of the middle section of the body between the edges 330, but the major part of this portion 332 is tapered to the end of the body, the convergent edges being designated 334 and the edges merging to form the point or tip 335.

At the tapered end or tip area 335, the material has a triangular tongue pressed therefrom as indicated at 336, the point of the tongue being directed toward the end of the portion in which it is formed.

The outer leg portion 333 of the protection and opener device also includes a part of the mid-section of the strip of material lying between the edges 330 as shown and this outer portion is also tapered toward its free end but the tapering side edges 337 do not come to a point or intersect but join the rounded terminal portion 338. Thus the tapered part of the outer portion 333 maintains a greater width throughout the taper than does the inner portion and the outer portion 333 adjacent to the rounded end has an aperture 339 formed therethrough for the purpose about to be described.

The mid-section of the body 329 has a triangular spur 340 struck therefrom, the point of the spur being directed toward the pointed end 335 of the body while the base portion of the triangle lies substantially on the fold line 331. Thus, it will be seen that when the body 329 is folded along the line 331 to bring the outer portion 333 into overlying relation with the inner portion 332, the spur 340 will swing under and will project away from the fold line as shown best in FIG. 19 where the device is shown in applied position on the receptacle wall 316.

The protection and opener device 312 is applied to the receptacle wall prior to the attachment of the sheet of frangible material 326 to the wall. When the device is placed in position, the long tapered inner or under portion or leg 332 is inserted through the opening 322 so that the point 335 will lie against the under side of the wall at the apex 325 of the opening and it will be seen that the width of the portion 332 from the fold line 321 entirely to the point 335 is greater than the width of the triangular opening through the major portion of the latter, the exception being at the base line 323 of the opening where, as previously stated, the width of the device between the lines must be very slightly less so as to permit the inner portion or leg 332 to be placed in position.

When the leg 332 of the device is placed against the under side of the wall 316 and the upper or outer leg portion 333 is bent over into superposed relation with the inner or lower leg portion 332, the opening 322 will be completely covered on the outside of the receptacle wall. The tongue 336 is raised slightly so as to extend above the wall in the apex of the opening in the crotch formed between the opening sides 324 when the lower leg is placed in position and is extended into or through the opening 339 in the top leg portion 333 of the opener and may then be bent down slightly as indicated at 336a in FIG. 19, against the top side of the outer portion 333 so as to form a locking connection therewith.

As previously stated, when the top or outer portion 333 of the opener is bent or folded along the line 331, the spur 340 will swing rearwardly from the fold line and when this is done after the lower portion 332 has been placed in position in the opening and against the under side of the wall 316, the spur 340 will engage the under surface of the wall 316 radially outwardly from the base portion 323 of the opening as illustrated. Placement of the frangible sheet 326 as illustrated and described will then completely cover the inner leg portion of the opener. Such inner leg portion of the opener likewise functions to close the pour opening and protect the frangible sheet from being blown out by pressure from within the receptacle.

The outer leg portion 333 likewise protects the frangible sheet against damage from the outside.

When the receptacle is to be opened, the top or outer portion 333 of the opener is grasped by the fingers of the hand and pulled upwardly as illustrated in FIG. 20. To facilitate this grasping of the top portion, this portion may be given a slight outward bow as indicated at 341 so that the side edges can be readily gripped between the fingers. When the top portion 333 is thus pulled up, the tongue 336 will first be disengaged from the opening 339 and as the portion 333 is bent upwardly to open the bend or fold at 331, the spur 340 will be swung downwardly and forced through the foil or frangible lining sheet 326, thus forming the opening 342 therein which will permit the escape of gases from the receptacle.

Following the manipulation of the portion 333 in the manner described and the preliminary escape of any gases which may be in the receptacle, an outward pull or jerk applied to the portion 333 will result in the removal of the lower leg portion 332 from the under side of the receptacle top through the opening 342.

The frangible sheet 326 is firmly attached to the under side of the wall 316 as indicated at 326a. As shown, the attaching means, here shown as a sealing material, not only bonds the frangible sheet to the wall but it also securely bonds the sheet to the under side of the opener portion 332. Thus it will be seen that when the portion 332 is pulled through the opening 342, the frangible sheet will be fractured around the edges of the opening and the portion covering the under side of the withdrawn lower leg 332 of the opener will come away with the leg and will be removed, leaving a portion of the sheet attached to the wall around the opening, as indicated at 342a. Accordingly, the opening 342 will at once be uncovered or opened so that the contents of the receptacle may be dispensed.

While the frangible sheet 326 has been shown as covering the complete inner surface of the wall 316 and continued around its periphery into the seam 320, the sheet may be made, if desired, only of sufficient size to completely cover the portion 332 of the opener and extend a sufficient distance beyond the edges of the opening to facilitate bonding it to the surrounding wall surface.

Referring now particularly to FIGS. 25 to 31, another structural means is shown by which the objects of the invention may be realized. In these figures, the protection and opener device is generally designated 356. In these latter figures, the container top wall is generally designated 350, while the container as a whole is designated 351. The wall 350 has formed therein the triangular pour opening 352 and the numerals 353 and 354 designate, respectively, the base edge and the convergent side edges of the opening, the latter edges merging at the apex 355.

The protection and opener device 356 is illustrated in the developed form in FIG. 31 and as shown comprises initially a long strip or body 357 of suitable metallic material which mid-way between its ends has the rectangular notches 358 cut in the side edges thereof. The portion of the body 357 from one side of the notches 358 to the end thereof has the side edges 359 tapered to the point

360 and this portion which is designated 361, constitutes the inner or under leg portion of the device.

From the notches 358 to the opposite end of the body 361, the side edges of the body are also tapered to a lesser degree, the side edges here being designated 362 and instead of intersecting to form a point as do the edges 359, these side edges 362 join the rounded end 363 and this portion, which is generally designated 364, forms the outer or top leg portion of the protection device when the body is bent or folded transversely to the form illustrated in FIG. 26.

The maximum width of the body 357 is materially greater than the width of the opening 352 across the base edge 353 thereof and the distance between the notches 358 is very slightly less than the width of the opening 352 along the base edge 353.

The lower or inner leg portion 361 of the device 356 has the pointed tongue 365 struck therefrom adjacent to the point 360 and this tongue is designed to engage in the crotch between the edges 354 of the opening 352 in the same manner as the point 356 engages in the crotch or at the pointed end of the opening 322 when the lower leg portion of the device is fixed in position.

The device 356 when placed in position in the opening 352 has the leg portion 361 introduced through the opening and disposed flat against the under side of the receptacle wall 350 with the point engaged with the tapered end or crotch of the opening 353. Since the overall width of the body 357 is greater than the maximum width of the opening and the length of the portion 361 is greater than the opening, it will be seen that this portion when placed against the under side of the wall can completely cover the opening.

The edges 354 of the opening 352 engage in the notches 358 at the widest part of the opening 352 or at the ends of the base 353 as illustrated and the body is bent or folded over along a fold line 366 to bring the top leg portion 364 into superposed relation with the bottom leg portion 361 but upon the top or outer side of the receptacle wall 350. Thus, a bordering part of the top portion 364 will extend beyond the sides of the opening 352 and the top portion will accordingly completely cover the opening.

As will be readily apparent upon reference to FIG. 31, one side of each of the rectangular notches 358 joins an edge 359 of the portion 361 to form a point or spur 367 and these two spurs at opposite sides of the body, as well as the portion 361, will be covered by the sheet of foil 368 or like frangible material with which the inner surface of the wall is covered. As in the preceding case, the foil 368 is firmly attached to the under side of the wall 350 as indicated at 368a. This seal may extend throughout the entire area of the under surface of the wall or as described in connection with the previously described device, the foil may be of a size to cover only the under side of the leg portion 361 and extend beyond the edges of the opening for a sufficient distance to provide enough for sealing attachment to the under side of the wall and also, as will be apparent from FIG. 26, the foil will be firmly sealed or bonded to the under surface of the opener portion 361.

To effect the puncturing of the foil 368 to permit gases to escape from the receptacle, the free end of the top portion 364 of the protection device is grasped and bent upwardly or raised from the top of the wall 350 approximately to the position illustrated in FIG. 27, following which an outward pull on the raised portion 364 to pull the inner or lower portion 361 through the opening 352, will force the spur portions 367 to bend downwardly as illustrated in FIG. 28. This downward bending of the spur portions 367 will cause the same to penetrate or puncture the foil, thus forming gas escape openings 369 as illustrated, particularly in FIG. 29 and this operation takes place simultaneously with the removal of the lower portion 361 through the opening. As will be seen, when the

portion 361 is withdrawn from the opening, the part of the foil which is secured to the under side thereof will be torn away along the edges of the opening 352 and simultaneously removed with the device and immediately uncover or open the opening to permit the contents of the receptacle to be dispensed.

While the invention has been hereinbefore described and it has been illustrated in association with a number of different means by which quick and easy opening of the container or receptacle can be accomplished, it will be seen that in connection with each of these different means, the pulling of the pull tab associated with the receptacle wall will not only remove a portion of the wall or remove a portion of the protection device from connection with the wall, but it will also effect complete removal of the portion of the frangible sealing sheet of foil lying beneath and attached to the part of the wall which comes away. Accordingly, it will be seen that there is provided in the present case a novel construction by which the opening of the receptacle is facilitated without requiring use of any type of cutting or punching implement or any tool other than a part of a wall or the receptacle itself.

As this invention may be embodied in several forms without departing from the spirit or essential characteristics thereof, the present embodiment is therefore illustrative and not restrictive, since the scope of the invention is defined in the appended claims, and all changes that fall within the metes and bounds of the claims, or that form their functional as well as conjointly cooperative equivalents, are therefore intended to be embraced by those claims.

We claim:

1. Container which can be opened by hand without a tool and having a frangible sheet on the inner side of a wall of the container and becoming a part thereof, characterized in that a pull tab capable of being grasped by human fingers is carried by said wall, the said frangible sheet being irremovably secured to a part connected to the pull tab and by removing said part from the wall, the frangible sheet is broken and removed simultaneously.

2. A container in accordance with claim 1, characterized in that the part to be removed with the pull tab is provided with means for initially fracturing the frangible sheet at the beginning of the removing of said part.

3. A container in accordance with claim 2, characterized in that said fracturing means is carried by the pull tab.

4. A container in accordance with claim 1, characterized in that the pull tab is securely attached to a part of the wall defined by a weakening line in the wall, said weakening line also defining an opening to be provided in the wall, the frangible sheet being attached to said part of the wall that is to be removed.

5. A container in accordance with claim 1, and by which the wall has a preformed opening covered by a protection member, said member being provided with a pull tab, characterized in that the frangible sheet is irremovably secured to the protection member and simultaneously removed therewith.

6. In a receptacle, a wall, said wall being formed with a portion thereof adapted to be separated from an adjacent surrounding portion, a frangible sheet of material disposed against the under or inner surface of said wall over and covering the said portion of the wall, said frangible sheet being irremovably secured to the said wall portion whereby the latter portion and the attached sheet portion are separable as one piece from said adjacent surrounding portion to form a pour opening and means carried by the said wall portion by which the latter portion may be separated from the said surrounding portion.

7. A wall construction for a receptacle comprising a body of sheet material having an outwardly disposed portion thereof adapted for sealed attachment to a receptacle

wall, said sheet having a pull-out portion inwardly of the outwardly disposed portion and being retained in place by a weakness line in the material, and the sheet material within the contour of said portion having a pull tab permanently fixed thereon, and the pull tab being adapted to be bent out for grasping with human fingers for pulling to effect the simultaneous complete separation of the pull-out portion from the outwardly disposed portion and there being a thin sealing sheet of frangible material irremovably secured to the inner surface of said sheet over and covering said weakness line to be ruptured upon the separation of the pull-out portion and withdrawn with the pull-out portion.

8. A can top having a central portion with inner and outer sides and a marginal portion for attachment to a can body, said central portion of the top having a rupturable connection with said marginal portion thereof, a one-piece elongated bendable pull tab struck from, integral with, and substantially coplanar with, and defining an opening in the material of the central portion of the top, said tab being substantially of the dimensions of the opening and being disposed therein and closing same and lying within the perimeter of the area defined by the central portion of the top and having a portion thereof permanently fixed to the central portion, a thin sheet of frangible material irremovably secured to the inner surface of said central portion of the top and extending over and sealing said rupturable connection, said pull tab having a free end portion directed inwardly toward a perimetrical portion of the top, and when the free end portion of the tab is lifted and pulled by the human fingers, the said connection and frangible sheet are ruptured and the central portion of the top is thus removed together with the portion of the frangible sheet which is irremovably secured thereto.

9. In a receptacle, a wall having a contour defining perimeter, the wall portion circumscribed by said perimeter being of a relatively thin tearable material, said material being structurally modified along a line lying closely adjacent to said perimeter in a manner to facilitate complete removal of the major part of the wall lying within said perimeter, said structural modification along said line consisting of a weakened reduced thickness of the material through the major extent of said line and a slit through the material along a minor extent of the line, a thin sealing sheet of frangible material irremovably secured to the inner surface of said wall portion and covering the said major extent of said line and further covering and sealing said slit, and means carried by the wall material within the area circumscribed by said line whereby a manual tear-out pull may be exerted by human fingers upon the material between the ends of said slit to effect the rupturing of the frangible sheet and the removal of the said major part of the wall together with the part of the frangible sheet irremovably secured thereto.

10. In a receptacle, a wall forming a part thereof, means forming a structural part of the wall and separable therefrom to provide a pour opening, a frangible liner sheet disposed against the inner surface of the wall, means fixed to said structural part of the wall for facilitating the manual separation by human fingers of said structural part from the wall, said frangible liner sheet being irremovably secured to the inner side of said structural part to be broken away and removed from the wall with the structural part, and means whereby the pull means functions to rupture said liner sheet.

11. The invention according to claim 10 wherein said frangible liner sheet is irremovably secured to the wall outside the area defined by said structural part whereby a portion of the liner sheet remains attached to the wall around the pour opening when the part of the sheet secured to the said structural part is removed.

12. In a receptacle, a wall forming a part thereof, a frangible sheet disposed against the inner side of the wall,

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said wall having a removable area defined by a break line, a pull tongue forming a fixed part of the removable area of the wall and lying in said area, said tongue having two free ends and joined to the wall area between its ends and on opposite sides, one of said free ends being positioned to be grasped by human fingers to be lifted above the surrounding surface of said area and the other free end being actuated downwardly by said lifting to effect rupture of said sheet, and said frangible sheet being irremovably secured to the inner side of said removable area to be torn around the perimeter of the removable area for simultaneous removal of the latter.

13. A container having a wall with a single opening therein and through which opening contents of the container can be dispensed, a protective means carried by said wall and characterized by a part fully covering said opening upon the inner side of said wall, means carried by said part of said protective means for securing said part in opening covering position, a sheet of frangible material covering said part and said opening upon the inner side of said wall and secured to said part, means on the outer side of said wall and connected with said part by which said part and the part of the frangible material secured thereto may be pulled and simultaneously removed together through said opening, and means whereby said sheet of frangible material will be perforated upon application of a pull to said part.

14. A container having a wall with a single opening therein and through which opening contents of the container can be dispensed, and a protective means carried by the wall and held thereon for complete removal therefrom and having an inner portion lying upon the inner side of the wall and extending fully across the opening in one dimension thereof and an outer portion located upon the outer side of the wall and adapted to be grasped to facilitate the complete removal of the protective means from the wall and fastening means engaging the wall adjacent to remotely located edge portions of the opening and which fastening means releases the protective means from the wall when said outer portion is grasped and moved outwardly from the wall, the frangible sealing member on the inner side of the wall fully covering and secured to said inner portion of the protective means and covering and sealing the opening and said fastening means embodying a part which ruptures the sealing means upon said outward movement of said outer portion.

15. A container having a wall with a single opening therein and through which opening contents of the container can be dispensed, and protective device carried by said wall in closing relationship with said opening and held thereon for complete removal therefrom, said device comprising a relatively wide flat strip of material folded upon itself on a transverse medial line providing an inner leg lying upon the inner side of the wall and extending fully across the opening in one dimension thereof and an outer leg located upon the outside side of the wall and adapted to be grasped to facilitate complete removal of the device from the wall, the portion of the device along said fold line lying within the opening along one edge of the latter, the said inner leg at the end remote from said fold line extending across the border of the opening and lying against the inner side of the wall, means carried by the device adjacent to said folded line and extending across the adjacent border of the opening and engaging the inner side of the wall, a tongue member carried by the said inner leg adjacent to the end thereof remote from the fold line and extending across the adjacent border of the opening and terminating over the outer

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side of the wall, a sealing sheet of frangible material covering said wall opening and said inner leg and sealing said wall opening and said frangible sheet being secured to said inner side of the wall around the inner leg and opening and being secured to the inner leg to have the portion secured to the inner leg torn away and withdrawn with the inner leg upon the opening of the container, and the said means carried by the device adjacent to said fold line being moved away from the inner side of the wall and functioning to rupture said sealing material upon the outward movement of said outer leg away from the wall opening.

16. The invention according to claim 15, wherein the said means carried by the protective device adjacent to said fold line comprises pointed lateral extensions of the inner leg and which lateral extensions are bendable and become downturned through engagement with the adjacent edge of the opening to effect the said rupturing of the underlying sealing material upon the said outward movement of the outer leg away from the opening and upon the application of an outward pull to the outer leg whereby to pull the inner leg and the material secured thereto through the opening.

17. The invention according to claim 15, wherein the said means carried by the protective device adjacent to said fold line comprises a triangular spur extending in the longitudinal direction of and away from the adjacent end of the inner leg and said spur being movable downwardly away from the wall by the said outward movement of said outer leg away from the opening to effect the rupturing of the underlying sealing material whereby upon the application of an outward pull to the outer leg, the said inner leg and the sealing material secured thereto will be withdrawn through the opening.

18. A container having a wall with an elongate triangular opening therein through which contents of the container can be dispensed, a frangible sealing sheet upon the inner side of the wall fully covering and closing said opening and secured to the wall around the opening, and a protective means carried by said wall and held thereon for complete removal therefrom and comprising two elongate parts in superposed relation and joined together at one end, the lower one of said parts being triangular in outline and fully covering said opening and lying between said wall and sealing sheet to protect the latter and having the sealing sheet bonded thereto, the said parts at the joined ends thereof being wider than the base edge of the triangular opening and having oppositely located notches receiving therein edges of the triangular opening at the base of the latter whereby the upper part is positioned upon the outer side of the wall and covers the triangular opening, a tongue member carried by the lower part adjacent to the apex end thereof and lying in and projecting upwardly from the apex portion of the triangular opening, and means releasably connecting said tongue and said upper part together.

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