INVENTOR

Clyde Maurice Moore

BY

Bacon & Thomas

ATTORNEYS
This invention relates to sealed structural joints and particularly to such joints in containers for liquids or gases.

The subject of the present invention constitutes an improvement of the inventions disclosed in this same applicant's copending applications, Serial No. 167,793, filed June 13, 1950, now Patent No. 2,673,659, and Serial No. 177,106, filed August 1, 1950.

The shipment and handling of liquid or gaseous materials is at the present time quite extensively practiced and presents a number of problems, particularly with respect to the containers employed for the materials. The usual type of container occupies a large volume of space when empty and necessitates considerable storage and shipping space. The present invention contemplates a container for such materials which can be disassembled for shipment or storage and also contemplates a suitable joint adaptable to containers made of materials not heretofore generally employed for such purposes.

It is necessary that a container be impervious and inert to the particular materials being handled. In present day commercial activity, it is necessary to handle many diverse types of liquid chemicals, many of which cannot be satisfactorily handled in containers made of conventional materials. It has been found that containers made of some thermosetting resins have the necessary characteristics to handle many of such chemical materials without deterioration of the container or contamination of the chemical. A well-known material, known to the trade as Fiberglas, has been developed which consists of a body of resinous material having fibers of glass embedded therein to impart structural strength to the product. Usually, the glass fibers occupy substantially the entire volume of the product and a suitable thermosetting resin bonds the fibers together and occupies all of the spaces therebetween and in addition defines the outer surfaces of the product. Articles of such material can be fabricated only by molding processes and to mold complete containers of the sizes demanded in commerce would involve extremely large, expensive and bulky fabricating machinery. Such containers would still be subject to the disadvantage of being bulky to handle, even when empty, even though they offer substantial advantages otherwise. Among the advantages are lightness and toughness.

The present invention contemplates a container construction of Fiberglas sheets so shaped as to be readily assembled to form a container and means are provided for assembling and joining the sheets at their edges to provide a completely sealed joint.

The disclosures made herein, while directed principally to the construction of Fiberglas containers, are nevertheless adaptable to containers constructed of other materials, such as metals, or to the construction of composite containers having portions of metal and portions of Fiberglas sheets.

Generally, the invention contemplates the structural shape of the sections to be employed and the manner of joining them in a sealed joint by applying a cementitious material to the joined portions and maintaining said material under pressure.

It is therefore an object of this invention to provide a container of resinous material having glass fibers embedded therein and means for satisfactorily assembling such a container.

It is a further object of this invention to provide means for constructing a completely sealed joint between sections of resinous material having glass fiber reinforcement therein.

Another object of this invention is to provide a container section comprising a head panel with an integral annular flange thereon to adapt the head for ready assembly to cylindrical or the like wall sections.

Another object of this invention is to provide a clamping bar for a sealed joint wherein the clamping bar is of inexpensive rolled sheet metal or extruded metal construction.

Still another object of this invention is to provide a container having a joint at a corner thereof wherein the completed joint presents no projecting portions beyond the normal outline of the container.

Still another object of the invention resides in a novel mitering arrangement between clamping and sealing bars of a sealed joint.

It is a still further object of this invention to provide a novel method and means for sealing the joints of a previously assembled container.

It is a still further object of this invention to provide novel means for pressing a sealing bar onto a flanged joint between wall sections of a container.

Further objects and advantages will appear to those skilled in the art as the description proceeds in connection with the accompanying drawings, wherein:

Fig. 1 illustrates an assembled container constructed according to one form of the present invention;

Fig. 2 is an enlarged sectional view taken substantially along the line 2—2 of Fig. 1;

Fig. 3 is a sectional view, on an enlarged scale, taken substantially along the line 3—3 of Fig. 1;

Fig. 4 is a sectional view taken substantially along the line 4—4 of Fig. 1 but showing the parts on an enlarged scale and in disassembled relationship;

Fig. 5 is a sectional view similar to Fig. 2 but illustrating a modified form of joint;

Fig. 6 is a view similar to Fig. 4 but showing a completely assembled joint of modified form;

Fig. 7 is a sectional view through a corner portion of a container showing a corner joint and a joint between coplanar sections but illustrating a still further modification;

Fig. 8 is a sectional view through the edge portion of a head panel for a container having a clamping bar permanently affixed thereto;

Fig. 9 is a fragmentary plan view of a mitered joint between sealing bars of a container constructed according to the present invention;

Fig. 10 is a perspective view of a portion of the arcuate sealing bar of Fig. 9;

Fig. 11 is a sectional view of a modified form of joint for a container;

Fig. 12 is an end view of a container constructed in accordance with a further modification of the invention;

Fig. 13 is a detail sectional view on an enlarged scale taken substantially along the line 13—13 of Figs. 12 and 14;

Fig. 14 is a sectional view taken substantially along the line 14—14 of Fig. 13;

Fig. 15 is a sectional view similar to Fig. 13 but showing a still further modified form of joint; and

Fig. 16 illustrates another modified form of joint.
Referring now to Fig. 1, there is shown a completely assembled container comprising a plurality of segmental cylindrical side wall sections 10 joined along longitudinal joints 12. The end portions of the side wall sections 10 are joined to suitable head panels 14 by means of sealing bars 16 and clamping bars (not shown in Fig. 1). The longitudinal joints 12 also include sealing bars 18 and clamping bars (not shown in Fig. 1).

As shown in Fig. 2, the head 14 is provided with an inverted diagonally disposed flange portion 20 and a radially outwardly directed flange edge 22 formed integrally therewith. Such a structure may readily be produced from Fiberglas by a molding operation. It is to be noted that the flange edge portion 22 extends substantially parallel to the head panel 14 but terminates inwardly of the outer cylindrical surface of the container. The wall segments 10 are provided with similar diagonally inwardly extending flange portions 24 and outwardly directed flange edge portions 26 around their entire peripheries. The wall sections 10, after being suitably molded and cured, are substantially rigid and extremely tough in character. As shown in Fig. 2, the flange edge portions 22 and 26 are spaced apart and receive the correspondingly bent central portion 28 of a W-shaped clamping bar 30. The clamping bar 30 is preferably of rolled sheet metal, such as steel, but may be of extruded material, and is provided with outer portions defining grooves of such shape as to snugly receive the inner faces of flanges 20 and 24 and the inner face portions of the flange edges 22 and 26. A sealing bar 16, preferably of extruded aluminum, so shaped as to be snugly received between the edges of the head 14 and panel 10, is provided with a longitudinally extending groove 34 adapted to snugly embrace the flange edges 22 and 26 with the central portion 28 of the clamping bar 30 therebetween. As shown, the sealing bar 16 is so configured that its surface lies substantially coincident with the outer cylindrical surface of the container.

The container shown in Fig. 1 is constructed of four cylindrical side wall sections but it is to be understood that a greater or lesser number of sections may be employed if desired. The clamping bars 30 and sealing bars 16 employed in the joint shown in Fig. 2 will necessarily be of arcuate configuration and are preferably arcuate sections extending only a portion of the distance around the container. It will be clear, however, that each of the bars may be continuous throughout the periphery of the container and have abutting end faces whereby they may be readily collapsed or expanded to facilitate assembly to the head 14.

A suitable screw or other thread element 36 extends through an opening in the sealing bar 16 and threadedly engages a tapped opening in the central portion 28 of clamping bar 30. When the parts have been assembled, the screws 36 may be tightened to draw the clamping and sealing bars toward each other and thus apply sealing pressure to the joint.

Fig. 3 is an edge view of a longitudinal joint of the container shown in Fig. 1, which joint is substantially identical to that shown in Fig. 2 except that the clamping and sealing bars are straight rather than arcuate. As shown in Fig. 3, the central portion 28 of the clamping bar 30 is tack welded, as at 38, adjacent the threaded bores therethrough. The tack welded portions prevent separation of the reversely bent central portions of clamping bar 30 when the screws 36 are drawn up tight.

Fig. 4 illustrates the parts constituting the joint of Fig. 3 just prior to their assembly. As shown, the outer faces of the flanges 24 and 26 are provided with a film or layer of cementitious material 40 and the outer faces of the clamping bar 30 are also provided with a layer of such material. The material 40 may be a suitable thermosetting or thermoplastic resin or any other suitable cementitious sealing material. It will preferably be applied in liquid form and cured after being applied to the inner faces of the joint. It will be obvious that upon complete assembly of the parts shown in Fig. 4 and the application of pressure to the joint by means of the screws 36, the cementitious material 40 will be caused to flow into all the openings or voids of the joint and even to flow longitudinally thereof to joints 12 on both sides of the joint, where such joints interlock, to effect a complete seal for the container. It is not necessary that the cementitious material 40 be of such nature as to bond with the clamping bar 30 as long as it is of such nature as to form an intimate bond with the sealing bar 18. There are available on the market suitable mixtures of thermosetting resins capable of permanently bonding to aluminum and such materials may be used in the present instance. A joint constructed in accordance with the previous description may be of a permanent nature, thus providing a permanently sealed Fiberglas container, or may be of such a nature that it may be readily softened after setting by suitable treatments to render the container easily demountable. While the description hereabove has been confined to the construction of a Fiberglas container, it is to be understood that the invention is adaptable to containers made of metal wall sections or combinations of metal and Fiberglas.

In the modification illustrated in Fig. 5, a head panel or end wall 42 is molded of Fiberglas material and is provided with an integral flange 44 extending substantially parallel to the head 42 but laterally spaced therefrom and terminating inwardly of the outer surface of the container. The flange 44 defines with the enlarged edge portion 46 of the head, a tapered outwardly directed annular groove. A wall section 10, similar in all respects to that described in connection with Figs. 1 to 4, may be employed with the head 42 of Fig. 5. In this modification, the edge flange 26 of the wall section 10 is brought into face abutting relation to the flange 44 and is held thereto by a layer of the cementitious material 40 previously described. A sealing bar 48, preferably of aluminum, is received within the grooves defined by the flanges 44 and 26 and their adjacent wall sections and is provided with a groove 50 of such size as to snugly embrace the flanges 44 and 26 and apply pressure thereto transversely of their abutting faces. In this modification, it is the cementitious material 40 is provided between the sealing bar 48 and adjacent wall and head sections to bond all of the elements of the joint together and provide a completely sealed joint. Although not shown in the drawing, it is preferred that the groove 50 in sealing bar 48 be tapered toward its bottom. That is, the width of the groove 50 at the bottom of bar 48, as seen in Fig. 5, is slightly greater than the width of the groove at the top thereof so that application of the sealing bar 48 to the joint will result in drawing the flanges 44 and 26 together and applying pressure to the layer of cementitious material therebetween.

Fig. 6 illustrates a joint corresponding to the joint of Fig. 4 but involving only the sealing bar 48 and cementitious material 40, as described in connection with Fig. 5. In the modification of Figs. 5 and 6, the inner or clamping bar of Figs. 2 to 4 is omitted. In this modification also, the outermost surfaces of the sealing bar are flush with the outer cylindrical surface of the container 10. According to the teaching of this modification, a container may be constructed, not only of Fiberglas wall sections, but also of metal sections or sections of other materials with a suitable bonding material being employed.

While the description of Figs. 1 to 6 has been directed to a cylindrical container, it is to be understood that the construction is as readily adaptable to containers of other shapes. For instance, the head panels 14 and 42 may
readily be made of any polygonal outline and the container may not necessarily be completely closed but may be left open at one side. The joint illustrated in Figs. 2 and 3, while intended to be sealed by such as the cement 40, need not be a sealed joint but may be merely a clamped joint which will be sufficiently tight to serve where solid materials are being handled.

Fig. 7 illustrates joint forming means for a structure having angularly related side walls, such as a square or rectangular tank or the like. The side wall sections 52 of this form each have diagonally extending flanges 54, similar to the flanges 24 of Figs. 2 to 6, and outwardly directed flanged edge portions 56. In this form, however, the member 56 extends diagonally outwardly but terminate short of the outer surface of the container. A side wall joint between coplanar side wall sections is maintained in sealed condition by means of a clamping bar 58 and sealing bar 60 having a flexible, flowable sealing material (such as rubber) 62 in a channel 59 extending thereinto, the contact being made by the side of the flanges 56. This joint is substantially as described in copending application 167,793, previously referred to but includes a groove 59 extending the length of bar 58 and provided to permit expansion of rubber 62 therewithout clamping the joint.

The corner of the container of Fig. 1 is adapted to join exactly similar side wall sections in angular relationship rather than in coplanar relationship. The sealing means includes a clamping bar 64 so shaped as to engage the inner faces of flanges 54 when adjacent wall sections 52 extend at the desired angle to each other. The flanges 54 and edge flanges 56 at the corner joint are identical to the flanges on the opposite edges of each wall section 52, which flanges extend completely around the entire periphery of each wall section. A sealing bar 66 of generally channel shape in section has intertumed flange portions 68 engageable within the groove defined by the edge flanges 56 and edge flanges 64 of the wall sections. The grooved portion or inside of the channel of sealing bar 66 contains a flowable, flexible sealing material 70 in position to engage and seal against the edges of the edge flanges 56 when the joint is assembled. It is to be noted that the cross-sectional outline of the sealing bar 66 is such that no portions thereof project outwardly of the plane defined by adjacent wall sections 52. Thus, the corner joint presents no projecting portions and containers constructed in accordance with this disclosure may be compactly stacked without waste of space. Suitable screw means 72, extending through the sealing bar 66 and threadedly engaged with the clamping bar 64, are operable to draw the bars tegnally outwardly and force the sealing material 70 against the edge flanges and cause the material to flow longitudinally to establish sealing contact with intersecting joints.

The modification of Fig. 7 is readily adaptable to the construction of containers assembled from Fiberglass panels and may, if desired, include the cementitious material previously described. However, the construction of this modification lends itself readily adaptable for containers made of sheet metal or composite containers having both metal and Fiberglass wall sections.

The bars 64 and 66 may be readily mitered to cooperate with corresponding mitered bars 58 and 60 of a side wall joint intersecting the corner joint. Such a mitered joint may be formed in accordance with the teaching of co-pending application Serial No. 167,793, or may be formed according to the showing of Figs. 9 and 10 herein, to be described in detail hereafter.

It is also possible to provide a modified form of connecting joint to effect a suitable seal between intersecting joints in a container. In the modification of Fig. 1, the longitudinally extending clamping bars and sealing bars 18 are mitered to end portions of arcuate clamping bars and sealing bars 16, thus defining a joint where three different bars come together. In the modification of Fig. 9, a longitudinal sealing bar 60 is provided with a generally pointed or mitered end 74 having a rounded tip 75 receivable in a complementary-shaped notch 76 in an edge of a sealing bar 60 defining an intersecting joint. As shown in Fig. 9, the notched sealing bar 60 is of arcuate configuration and joins side wall sections to a head panel or end wall. Clearly, the structure of the joint may be employed where both sealing bars are straight. The basic construction of the joint of Fig. 9 is the same as that shown in the right hand portion of Fig. 7 and includes a strip of flowable, flexible sealing material 62 in a channel therein. According to the modification of Fig. 9, the sealing material 62, which is preferably of a self-sustaining nature, such as vulcanized rubber, is not mitered as are the bars 58 and 60 but is left with straight transverse end surfaces and unnotched side edges. When the joint is assembled, the end surface of one of the sealing strips 62 abuts against the side edge surface of the sealing strip in the intersecting joint, as at 78, and when pressure is applied to the clamping and sealing bars, the material 62 is caused to flow lengthwise of the joint and establish firm sealing contact at the interface 78 to completely seal the end section of the joint. It is to be noted that the interface between the abutting surfaces of the sealing material is offset relative to the abutting surfaces of the clamping and sealing bars. Fig. 10 illustrates the construction of the arcuate sealing bar which is notched and shows the relationship of the notched portion thereof to the sealing material 62 extending longitudinally therein.

Fig. 8 illustrates a modification in which a head panel or end wall 80 is permanently and rigidly joined to an end clamping ring or bar 58. The clamping bar 58 is preferably in the form of an annular ring rather than being formed of separate segments and is provided with outwardly facing grooves 82 and 84 similar to the grooves in the clamping bar 58 of Fig. 7. Clearly, the ring 58 may be made up of a plurality of segments rather than a single piece. The mitered or end wall 80 is preferably formed of metal and its peripheral edge is spun and pressed into the groove 84 of clamping ring 58 as shown at 86 to thereby lock the head panel 80 to the clamping ring 58 and rigidly and permanently secure those elements together while providing a flange edge at 87 corresponding to the flanges 56 of Fig. 7. In constructing a container incorporating the assembly described, side wall sections 52 (shown in dotted lines) may be positioned with their edge flanges in the groove 82 and a suitable sealing bar 60 positioned therewith to complete the joint as previously described. This structure lends itself readily to the construction of containers having Fiberglass side wall sections and metallic heads and is also adaptable to containers made entirely of metal.

Fig. 11 illustrates a still further modified form of joint for a container. In this modification, side wall sections 52, similar to those shown in Fig. 7, are placed in the illustrated relationship to a clamping bar 58 and sealing bar 88. The sealing bar 88 is pressed in position against the outer faces of the edge flanges 54 and 56, as also shown in Fig. 7. It is intended that suitable threaded means be employed to clamp the bars 58 and 88 together in the described manner. In this modification, the sealing bar 88 is not provided with the flowable sealing material 62 in the channel 90. Instead, the channel 90 is left empty and the sealing bar 88 is provided with a suitable valve fixture 92 whereby, after the joint has been completely assembled as shown in Fig. 11, suitable sealing or cementing material may be injected under pressure through the fitting 92 to traverse the entire length of the joint, fill the space 90 and provide a seal between the edges of flanges 56. In the joint the side wall sections 52 are of Fiberglass, the material forced into spaces 90 may be a suitable cement therefor, although any other suitable sealing material may be employed. The sealing material may be of such nature that it will set or harden after a short time, thus providing a permanent joint and may even be of such nature that it may again be softened.
upon suitable heat treatment or otherwise to render the container demountable. It is contemplated that sufficient pressure be employed in injecting the sealing material to maintain the material under pressure at all times, even after it hardens, if it be a material of that type. Properly mitering the ends of the clamping and sealing bars where joints intersect, a continuous passageway will be formed whereby a single fitting 92 may suffice to seal an entire container. However, if desired, a separate fitting 92 may be employed for each length of sealing bar 88 in the container. The fitting 92 may be of the type commonly employed for pressure lubrication where an air-operated “gun” forces grease into a bushing under pressure.

In the modification shown in Figs. 12, 13 and 14, the end or the head panel 100 may be the same as disclosed in Fig. 2 or may be of the type of Fig. 5 and is joined in general the same manner to a wall section 10 as shown in Figs. 5 and 6. In this modification, however, the sealing bar 102 is a single annular ring extending completely about the container and is provided with an internal strip of deformable sealing material 104, which may be rubber or the like. The adjacent ends of the annular sealing ring 102 are provided with overlapping portions (see Fig. 14) extending in a longitudinal direction, which overlapping portions also constitute the portions confining the sealing material 104. Adjacent ends of the sealing bar or ring 102 are provided with ears or lugs 106 which may be welded or otherwise secured thereto. The lugs or ears 106 are provided with aligned openings through which a bolt or the like 108 extends. By means of a nut 110, the ends of the sealing bar 102 may be drawn together to thereby urge the entire ring radially inwardly and urge the ends thereof together in a manner to compress the sealing material 104 against the edges of the flanges of the head member 100 and side wall section 10.

The overlapping portions of the end portions of the sealing bar 102 are in staggered relation to the abutting ends of the sealing material 104 (shown at 112) and thereby act to effectively confine the sealing material within the joint even though the ends of the sealing bar 102 may fall short of abutting engagement with each other. While a bolt 108 and nut 110 are shown in the drawings, it is to be understood that any suitable tensioning means, such as a turnbuckle or the like, may be provided to perform the function described.

Figs. 13 and 14 illustrate the head 100 and the side wall section 10 as being constructed of the plastic material herein described and it is to be understood that the cementitious material 40 of Figs. 1 to 6 may be employed in addition to the sealing means 104 or the arrangement shown in these figures may be employed with an all-metal container having joints wherein flanges of adjacent sections are brought into abutment with each other, such as, for instance, a mid-section joint between the ends of a cylindrical container.

Fig. 15 discloses a modification wherein an end panel 120 is provided with an integral out-turned flange 122 in abutment with an outwardly turned flange 124 of a wall section 126. In this construction, the sealing bar 128 need not be of the tapered section disclosed in connection with Figs. 13 and 14 but may be square, rectangular, or any other desired shape. The sealing bar 128 is provided with a hollow passageway 130 extending the full length thereof and filled with a suitable deformable sealing material 132 which may be rubber or the like. An inwardly facing slot 134 communicates with the passageway 130 and is of such width as to snugly receive the flanges 122 and 124 therebetween and constituting a seal for the material 132 whereby the latter is confined and completed herein. It is contemplated that the sealing bar 128 of Fig. 15 be tensioned and clamped to the container by such means as disclosed in Figs. 13 and 14. Ears or lugs correspondingly provided on the outer peripheral face of the sealing bar 128 or may be provided on a side face thereof.

In all of the forms disclosed wherein the rubber or rubber-like sealing material is employed, it will be apparent that the joints are so constructed as to prevent contact between the contents of the container and the rubber-like material of the sealing bar to thereby prevent deterioration of the rubber which may be caused by the material being handled. In the type of joint illustrated in Fig. 7, the clamping bar 88 constitutes a barrier between material 62 and the container contents while in the form of joint shown in Figs. 5, 6 and 12 to 15, direct engagement between the flanges of adjacent wall sections and/or cementitious material placed therebetween constitutes such a barrier.

The modification of Fig. 16 is particularly well adapted for forming a joint in a structure wherein it is desired to have a substantially smooth inner surface. The structure is particularly useful in forming pipe wherein the inner surface must be reasonably free of projections which might otherwise interfere with flow of material therethrough. In this modification, the inner surface of a clamping bar 150 is substantially coextensive with the cylindrical inner surface of the wall sections 152. The wall sections 152 are preferably molded with integral flanges 154 cooperating with sealing material 156 in a sealing barrier 158 in the manner heretofore described. It will be noted that the flanges 154 are so positioned as to be disposed outwardly of the cylindrical inner surface of the wall sections 152 and are integral therewith. Preferably, the wall sections 152 are thickened adjacent the flanges and the outer surface is formed with a radius R as shown. The added material at the radius R has the effect of materially strengthening the structure.

While a limited number of specific embodiments of the invention have been shown and described herein, it is to be understood that the invention is not limited thereby but may encompass other modifications falling within the scope of the appended claims.

claim:
1. A structure comprising, sheet-like wall sections of resinus material with reinforcing fibers embedded therein, the peripheral edges of each wall section extending diagonally inwardly of said structure then being reversely bent to define outwardly directed flanges, said flanges terminating inwardly of the outer surface of said wall section, inner and outer clamping bars, said outer clamping bar having a groove therein embracing said flanges, said inner clamping bar being of sheet metal and of generally W-shape in section having a reversely bent central portion, the said central portion thereof extending between said flanges and the edge portions thereof engaging the inner faces of said diagonally extending wall portions, and means drawing said clamping bars together to clamp said flanges therebetween.
2. A structure as defined in claim 1 wherein said last named means comprise threaded means extending through said outer clamping bar and threaded through the said central portion of said inner clamping bar, the opposed portions of said reversely bent central portion of said inner clamping bar being welded together adjacent said threaded means.

(References on following page)
<table>
<thead>
<tr>
<th>Patent Number</th>
<th>Inventor</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>429,660</td>
<td>Sullivan</td>
<td>June 10, 1890</td>
</tr>
<tr>
<td>492,001</td>
<td>Forgie</td>
<td>Feb. 21, 1893</td>
</tr>
<tr>
<td>502,846</td>
<td>Caird</td>
<td>Aug. 8, 1893</td>
</tr>
<tr>
<td>549,220</td>
<td>Townsend et al.</td>
<td>Nov. 5, 1895</td>
</tr>
<tr>
<td>577,097</td>
<td>Abrahams</td>
<td>Feb. 16, 1897</td>
</tr>
<tr>
<td>1,376,216</td>
<td>Mittinger</td>
<td>Apr. 26, 1921</td>
</tr>
<tr>
<td>1,723,307</td>
<td>Sipe</td>
<td>Aug. 6, 1929</td>
</tr>
<tr>
<td>2,140,672</td>
<td>Gray et al.</td>
<td>Dec. 20, 1938</td>
</tr>
<tr>
<td>2,148,510</td>
<td>Simison</td>
<td>Feb. 28, 1939</td>
</tr>
<tr>
<td>2,266,702</td>
<td>Byers</td>
<td>Dec. 16, 1941</td>
</tr>
<tr>
<td>2,311,613</td>
<td>Slater</td>
<td>Feb. 16, 1943</td>
</tr>
<tr>
<td>2,328,197</td>
<td>Cowin</td>
<td>Aug. 31, 1943</td>
</tr>
<tr>
<td>2,329,966</td>
<td>Wiggins</td>
<td>Sept. 21, 1943</td>
</tr>
<tr>
<td>2,335,174</td>
<td>Crawford</td>
<td>Nov. 23, 1943</td>
</tr>
<tr>
<td>2,364,083</td>
<td>Lindsay</td>
<td>Dec. 5, 1944</td>
</tr>
<tr>
<td>2,402,253</td>
<td>Macleod</td>
<td>June 18, 1946</td>
</tr>
<tr>
<td>2,412,024</td>
<td>Young</td>
<td>Dec. 3, 1946</td>
</tr>
<tr>
<td>2,545,481</td>
<td>Maier</td>
<td>Mar. 20, 1951</td>
</tr>
<tr>
<td>2,566,777</td>
<td>Schmidt</td>
<td>Sept. 4, 1951</td>
</tr>
</tbody>
</table>