

March 6, 1962

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3,023,921

HYDRAULIC RESERVOIR

Filed Oct. 12, 1959

3 Sheets-Sheet 1

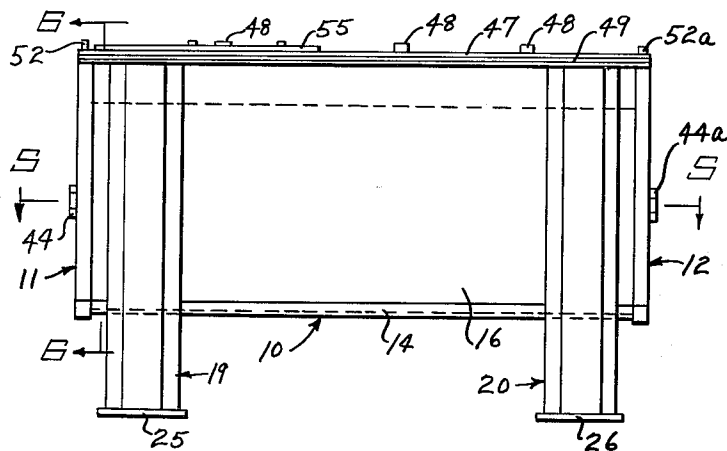


Fig. 1

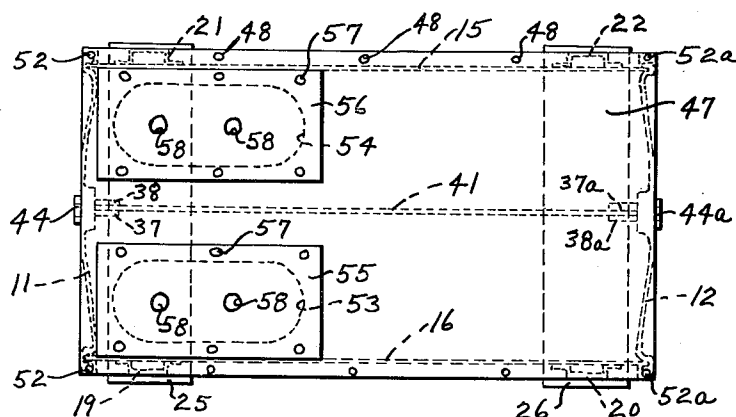


Fig. 2

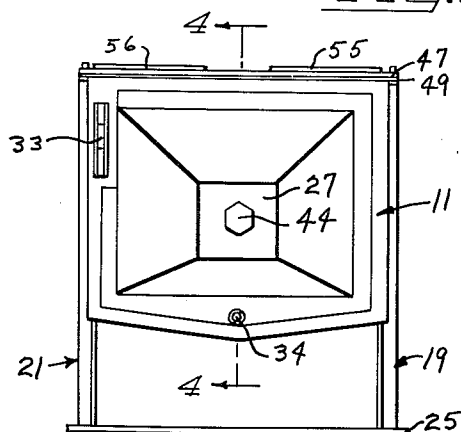


Fig. 3

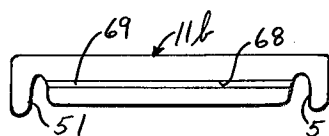


Fig. 12

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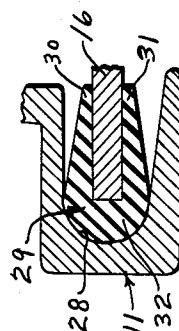
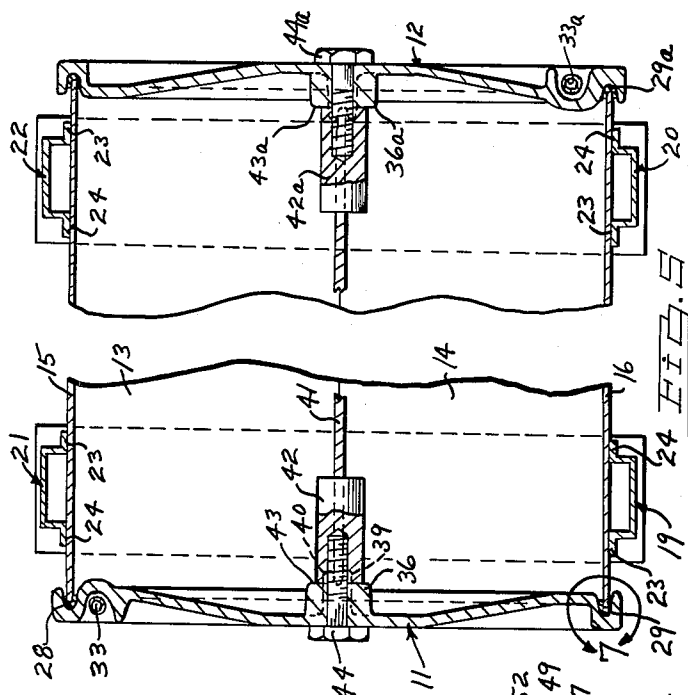


FIG. 7

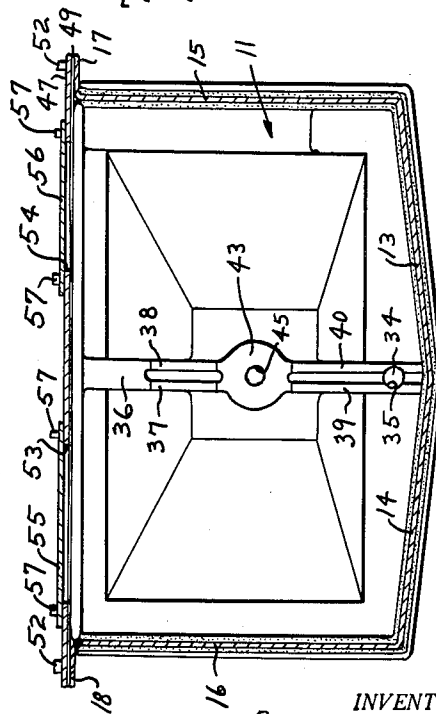
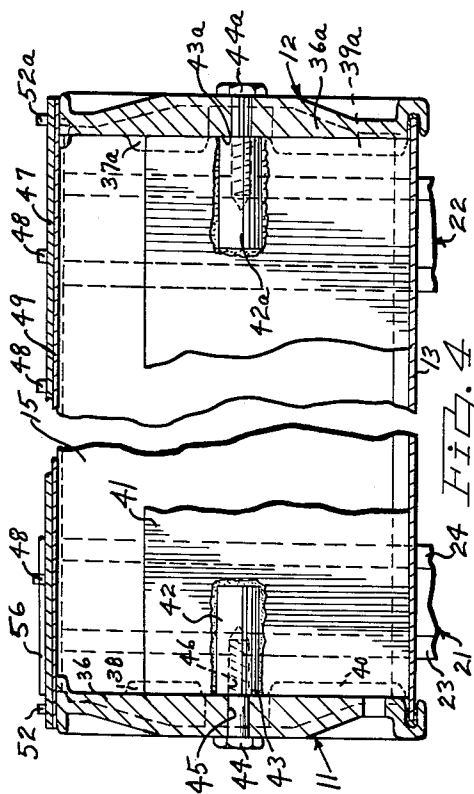


FIG. 6

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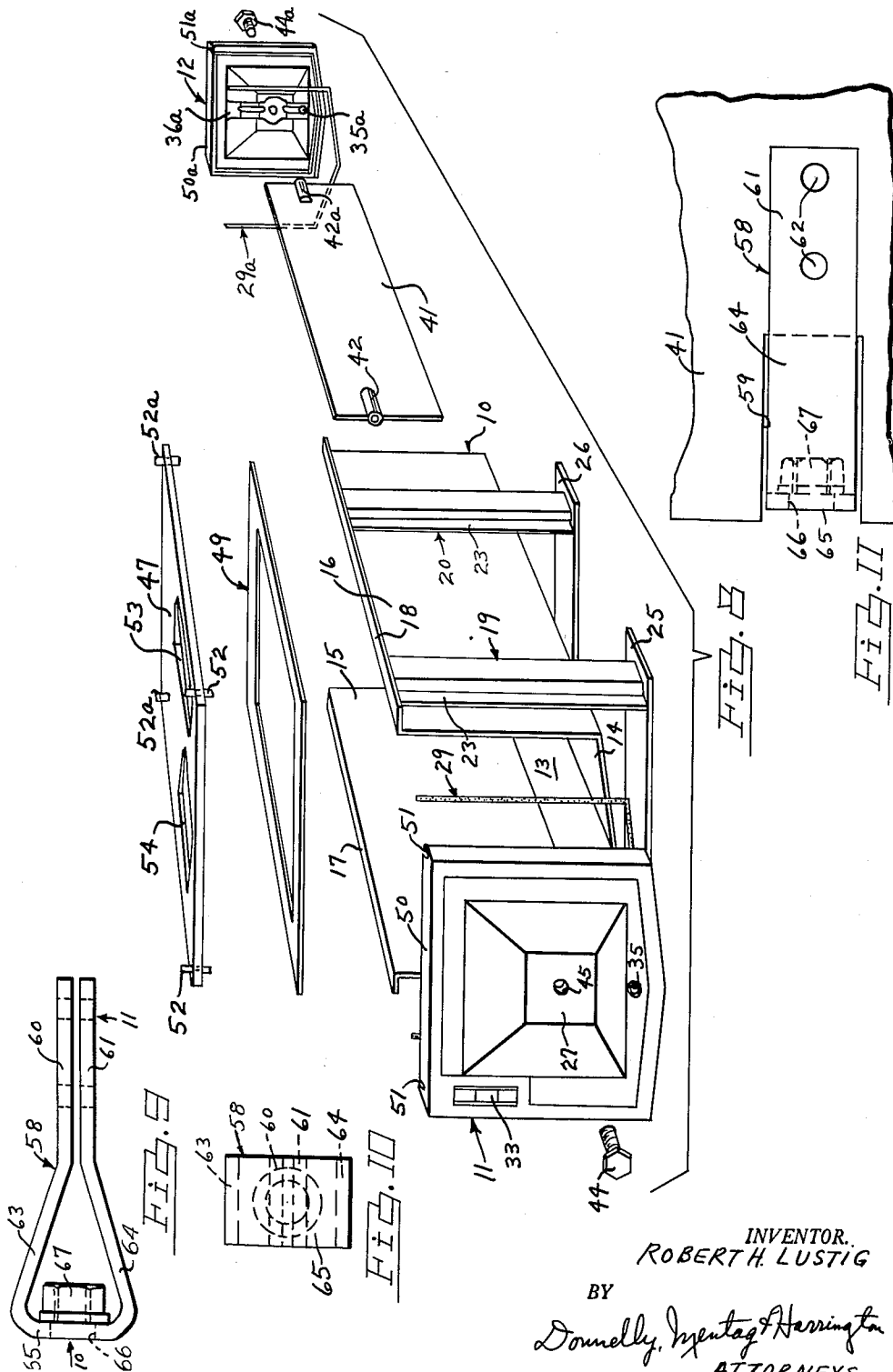
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HYDRAULIC RESERVOIR

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This invention relates generally to hydraulic oil tanks or reservoirs, and, more particularly, to a new and improved hydraulic reservoir of a non-welded construction.

It is an important object of this invention to provide a hydraulic reservoir which incorporates a one piece belly construction which is open at the top and ends thereof and wherein the top is enclosed by means of a bolted cover and the ends are enclosed by end covers, with each end cover being secured in place by means of a single bolt, whereby, the belly may be exposed quickly and easily for quick and sure maintenance. The one piece belly construction is built without seams or welds and thus provides a construction wherein there are no dirt traps, and no hidden corners to hamper thorough removal of sediment.

It is a further object of this invention to provide a hydraulic reservoir of the class described wherein a novel sealing member is employed between each of the end covers and the tank belly and the sealing members are adapted to engage the edges of the tank belly for a sealing engagement with the same.

It is another object of this invention to provide a hydraulic reservoir of the class described wherein both of the end covers are interconnected by means of a common tie member that equalizes the sealing pressure on each cover and also serves as a longitudinally disposed baffle plate in the tank.

It is a still further object of this invention to provide a hydraulic reservoir of the class described which is economical of manufacture, simple and compact in construction, and efficient in operation.

Other objects, features and advantages of this invention will be apparent from the following detailed description and appended claims, reference being had to the accompanying drawing forming a part of the specification wherein like reference numerals designate corresponding parts of the several views.

In the drawings:

FIG. 1 is a side elevational view of a hydraulic reservoir made in accordance with the principles of the invention;

FIG. 2 is a top plan view of the structure illustrated in FIG. 1;

FIG. 3 is a left end view of the structure illustrated in FIG. 1;

FIG. 4 is a fragmentary, slightly enlarged, broken, elevational sectional view of the structure illustrated in FIG. 3, taken substantially along the line 4-4 thereof, and looking in the direction of the arrows;

FIG. 5 is an enlarged, broken, horizontal sectional view of the structure illustrated in FIG. 1, taken along the line 5-5 thereof, and looking in the direction of the arrows;

FIG. 6 is a slightly enlarged, elevational sectional view of the structure illustrated in FIG. 1 taken along the line 6-6 thereof, and looking in the direction of the arrows;

FIG. 7 is an enlarged, fragmentary sectional view of the structure illustrated in FIG. 5, and within the circle marked "7";

FIG. 8 is an exploded view of the illustrative embodiment of the invention;

FIG. 9 is a top plan view of a modified adaptor for securing the baffle plate in place;

FIG. 10 is a front end view of the structure illustrated in FIG. 9;

FIG. 11 is a side elevational view of the structure illustrated in FIG. 9, and showing the adaptor mounted in place on the baffle plate; and,

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FIG. 12 is a top plan view of a modified end cover.

Referring now to the drawings, and in particular to FIGS. 1 and 8, an illustrative embodiment is shown which comprises a body having a belly portion and two end covers generally indicated by the numerals 10, 11, and 12, respectively. The belly portion 10 is formed from a single piece of metal, preferably from a scale free pickled steel, thus assuring freedom from foreign matter. The one-piece belly portion 10 is substantially U-shaped in cross section, with the bight part thereof including the two sections 13 and 14 which form the bottom wall of the reservoir and which taper downwardly and inwardly and meet along the longitudinal centerline of the belly. The belly portion 10 further includes the vertical side walls 15 and 16 which extend upwardly from the outer edges of the bottom wall sections 13 and 14, respectively. Extended outwardly, horizontally from the upper edge of the side walls 15 and 16 are the flanges 17 and 18, respectively.

The reservoir of the present invention includes the four vertical legs generally indicated by the numerals 19, 20, 21 and 22. Each of the legs is formed channel shaped in cross section and is provided with the sidewardly extended integral flanges as 23 and 24 along the outer edges of the side walls of the channels. The flanges 23 and 24 on each of the legs 19, 20, 21 and 22 abut the side walls of the belly portion 10 and are welded thereto, and the upper ends of the legs are welded to the lower sides of the flanges 17 and 18. As best seen in FIG. 2, legs 19 and 20 are welded to side wall 16 and legs 21 and 22 are welded to side wall 15, so as to provide a leg disposed on each side of the tank or reservoir adjacent each end thereof. The lower ends of legs 19 and 21 are fixedly mounted on the ground engaging, base cross plate 25 as by welding, and the legs 20 and 22 are similarly mounted on the plate 26.

The end covers 11 and 12 are similarly constructed and only one will be described and the corresponding parts of the other will be marked with similar reference numerals followed by the small letter "a." As shown in FIGS. 3 and 8, the end cover 11 is formed with straight vertical side edges and a flat horizontal top edge. The bottom edge of the cover 11 tapers inwardly and downwardly from each side thereof to provide a downwardly depended lower edge which is similar to the downwardly sloping bottom wall of the belly 10. As shown in FIG. 8, the end cover wall is bent inwardly or dishd so as to pre-stress the end cover and the bottom surface of this dishd area is indicated by the numeral 27. The end cover 11 is provided with a peripheral groove as 28 around the side and bottom edges thereof so as to form a substantially U-shaped groove for the reception of a similarly U-shaped cover seal generally indicated by the numeral 29. As shown in FIG. 7, the end cover seal 29 is substantially U-shaped in cross section, having the leg portions 30 and 31 between which is received the end edges of the belly side walls and bottom walls. As shown in FIG. 7, the side walls of the cover seal 29 extend outwardly from the bight portion 32 and the outer sides thereof taper inwardly.

The end cover 11 is provided with the recessed sight gauge 33 and a drain plug 34 adapted to be mounted in the drain hole 35 formed towards the lower end of the end cover on the center line thereof. As shown in FIGS. 4 and 6, the end cover 11 is provided with a centrally disposed vertical reinforcing rib 36 which carries an upper pair of inwardly extended spaced apart vertical locating plates 37 and 38 and a lower pair of similar locating plates 39 and 40. As shown in FIG. 4, the locating plates 37, 38, 39 and 40 are adapted to receive therebetween one end of the vertical baffle plate 41. The baffle plate 41 is vertically disposed and the lower edge thereof rests along the center line of the bottom wall of the belly 10

and this plate extends for the entire length of the reservoir and also extends upwardly to a point adjacent the top of the reservoir. The baffle plate 41 is provided with a boss 42 which is adapted to be seated against the seat 43 on the rib 36. The baffle plate 41 is adapted to be releasably secured to the end cover 11 by means of the single bolt 44 which passes through the aperture 45 in the cover 11 and is threadably engageable in the hole 46 in the boss 42. It will be seen that when both of the end covers 11 and 12 are mounted on the belly and the two bolts 44 and 44a are tightened, the two end covers will be bolted to either end of the baffle and drawn up tight against the belly 10 and will be put under a stress. The aforementioned end cover stress construction is held in constant tension against the seals 29 and 29a to provide an efficient sealing between the end covers and the belly 10.

The belly 10 is enclosed on the upper end by means of the flat cover plate 47 which is fixedly secured to the flanges 17 and 18 by any suitable means, as by the bolts 48 which are threadably secured to said flanges. A suitable square ring gasket as 49 is mounted between the flanges 17 and 18 and the cover plate 47 and the inwardly extended flanges 50 and 50a formed along the top edge of the end covers 11 and 12. As shown in FIG. 8, the flange 50 is provided with the inwardly extended slots 51 at each end thereof for the reception of the locating pins 52 mounted in the corners of the cover plate 47. As shown in FIGS. 2 and 6, the cover plate 47 is provided with the access holes 53 and 54 which are enclosed by the access covers 55 and 56, respectively, which are fixedly mounted in place by any suitable means, as by the bolts 57. The access covers 55 and 56 may be provided with any desired piping connections depending on the use to which the tank is to be put. The numerals 58 indicate piping holes in the access covers, and as many of these holes may be made as needed. The cover plate 47 is strong enough to have pumps and motors mounted directly thereon and it will be seen that the weight of the motors and accessories mounted on this plate are supported directly by the legs 19, 20, 21 and 22. The added weight of the accessories is not put on the reservoir itself, due to the novel overall construction of the reservoir.

Experience has shown that the hydraulic reservoir of the present invention is highly efficient in use, and the one-piece construction belly may be completely exposed for quick, sure maintenance. The end covers may be quickly removed by merely removing the bolts 44 and 44a and the baffle 41 may also then be removed and the tank quickly cleaned. Because the one-piece belly is built without bolts, seams or welds there are no dirt traps and no hidden corners to prevent thorough removal of sediment. A unique feature of the instant hydraulic reservoir is that the edges of the belly of the reservoir are the sole mating members to the seals in the end covers. A further unique feature of the instant reservoir is that the baffle plate 41 forms a common tie member between the end covers 11 and 12 which draws two end covers against the seals 29 and 29a with equal pressure. It will be obvious that a different type of tie member other than the baffle plate 41 may be used as a common linkage between the covers as, for example, an elongated rod having threaded holes in the ends thereof.

A modified adapter generally indicated by the numeral 58 is shown in FIGS. 9, 10 and 11 and this adapter can be used in place of the bosses 42 for securing the end covers to the baffle wall 41. As shown in FIG. 11, a baffle 41 is shown as being provided with the recesses 57 for the reception of the adapter 58. It will be understood that the baffle plate 41 will be provided with a recess 59 at each end thereof. The adapter 58 comprises the two elongated spaced apart arms 60 and 61 which are adapted to receive the baffle plate 41 therebetween and be fixedly secured thereto by any suitable means as by the rivets 62. The adapter further comprises the integral

head portion which includes the outwardly diverged arms 63 and 64 that are integrally connected to the arms 60 and 61, respectively. The outer ends of the arms 63 and 64 are joined by the integral outer plate 65 through which is formed the hole 66. A threaded nut 67 is fixedly secured to the inner side of the plate 65 as by welding. It will be seen that the bolts 44 may be threadably mounted into the nut 67 to secure the baffle plate 41 to the end covers.

FIG. 12 shows a slight modification of the end covers in which a groove 68 is provided on the upper end thereof for the reception of an elongated strip of sealing material for engagement with the top cover plate 47. In the use of this modification 11b, sealing ring gasket 49 would be eliminated. A suitable strip of sealing material would then be used along the top of the side walls of the tank. The groove 68 would be made approximately one-fourth of an inch deep and would extend between the two slots 51.

While it will be apparent that the preferred embodiments of the invention herein disclosed are well calculated to fulfill the objects above stated, it will be appreciated that the invention is susceptible to modification, variation and change without departing from the proper scope or fair meaning of the subjoined claims.

What I claim is:

1. A hydraulic reservoir of the class described, comprising: a belly portion formed from a single piece of material and having an open top and open ends; a longitudinally extended baffle plate mounted in said belly section; said belly portion open ends being enclosed by removable end covers; means for detachably connecting said end covers to said baffle plate for securing the end covers to said belly portion; and, a cover plate for enclosing the open top end of said belly portion.

2. A hydraulic reservoir as defined in claim 1, wherein: said means for detachably connecting said end covers to said baffle plate comprises a fixedly mounted boss on each end of the baffle plate, each of said bosses being provided with a threaded hole extending inwardly thereof and a bolt mounted through each end cover and adapted to be threadably mounted into the boss.

3. A hydraulic reservoir as defined in claim 1, wherein: said means for detachably connecting said end covers to said baffle plate comprises an adapter fixedly mounted to each end of the baffle plate; each set of adapters being provided with a head portion having a threaded nut carried thereon and a bolt mounted through each end cover and adapted to be threadably secured into the nut of the adjacently disposed adapter.

4. A hydraulic reservoir of the class described, comprising: a belly portion formed from a single piece of material and having an open top and open ends; a longitudinally disposed connector member mounted in said belly portion; said belly portion open ends being enclosed by removable end covers; means for detachably connecting said end covers to said connector member for securing the end covers to said belly portion including a fixedly mounted adaptor on each end of the connector member with each of said adaptors being provided with a head portion having a threaded nut carried thereon and a bolt mounted through each end cover and adapted to be threadably secured into the nut of the adjacently disposed adaptor; a cover plate for enclosing the open top end of said belly portion; each of said end covers being provided with a U-shaped recess formed along the bottom and sides thereof along the inner edge thereof; and, a sealing means mounted in each of the U-shaped recesses in the end covers for sealingly engaging the ends of the belly portion.

5. A hydraulic reservoir of the class described, comprising: a belly portion formed from a single piece of material and having an open top and open ends; a longitudinally extended baffle plate mounted in said belly section; said belly portion open ends being enclosed by re-

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movable end covers; means for detachably connecting said end covers to said baffle plate for securing the end covers to said belly portion; a cover plate for enclosing the open top end of said belly portion; each of said end covers being provided with a U-shaped recess formed along the bottom and sides thereof along the inner edge thereof; and, a sealing means mounted in each of the U-shaped recesses in the end covers for sealingly engaging the ends of the belly portion.

6. A hydraulic reservoir of the class described, comprising: a belly portion formed from a single piece of material and having an open top and open ends; a longitudinally disposed connector member mounted in said belly portion; said belly portion open ends being enclosed by removable end covers; means for detachably connecting said end covers to said connector member for securing end covers to said belly portion including a fixedly mounted boss on each end of the baffle plate with each of said bosses being provided with a threaded hole extending inwardly thereof and a bolt mounted through each end cover and adapted to be threadably mounted into the boss; a cover plate for enclosing the open top end of said belly portion; each of said end covers being provided with a U-shaped recess formed along the bottom and sides thereof along the inner edge thereof; a sealing

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means mounted in each of the U-shaped recesses in the end covers for sealingly engaging the ends of the belly portion; and, each of said ends is provided with an inwardly directed dished area whereby the end covers are put in a stressed condition.

7. A hydraulic reservoir of the class described, comprising: a belly portion formed from a single piece of material and having an open top and open ends; a longitudinally extended baffle plate mounted in said belly section; said belly portion open ends being enclosed by removable end covers; means for detachably connecting said end covers to said baffle plate for securing the end covers to said belly portion; a cover plate for enclosing the open top end of said belly portion; said belly portion having side walls which are provided with longitudinally extended flanges on the upper end thereof; and, a plurality of supporting legs fixedly connected to each of the side walls of said belly portion and having the upper ends thereof connected to said flanges.

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