

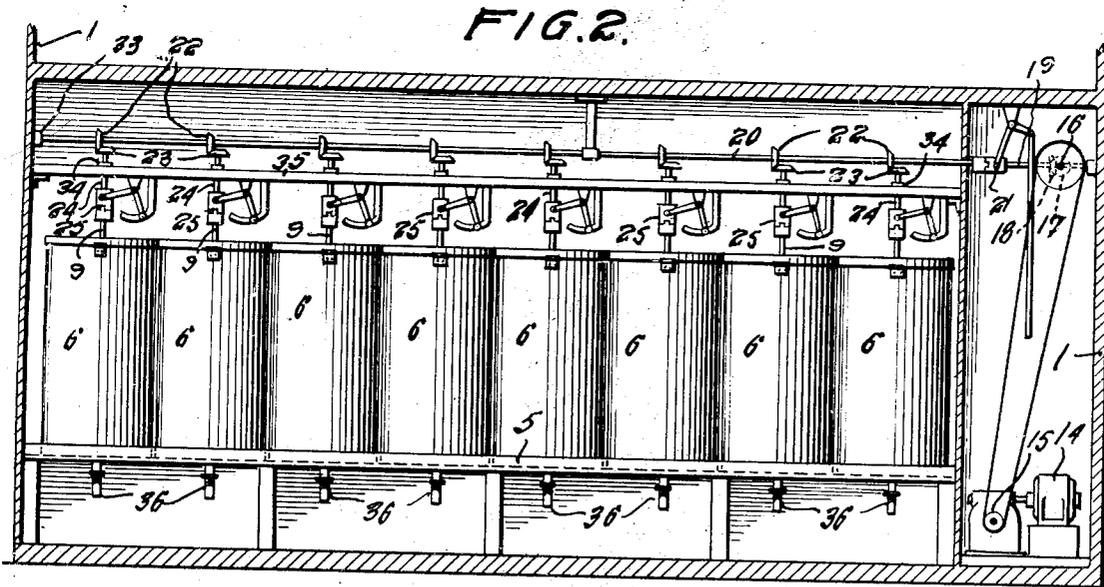
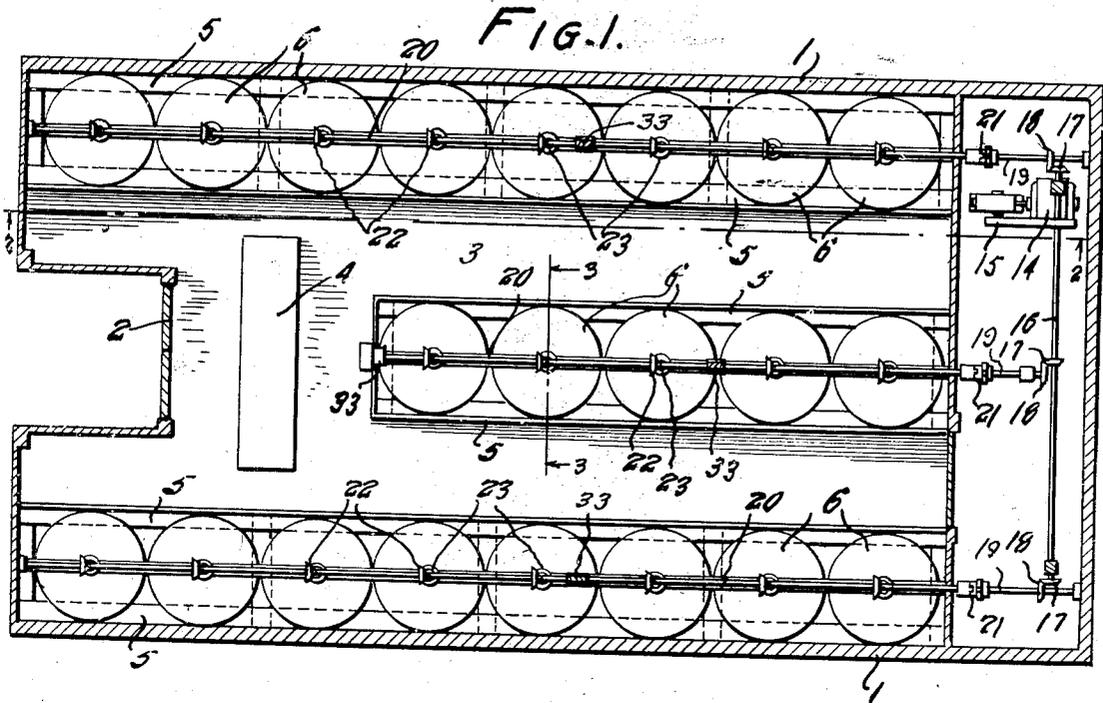
Jan. 26, 1932.

L. H. HANCOCK
DISPENSING LIQUIDS

1,842,938

Filed Sept. 6, 1929

3 Sheets-Sheet 1



Inventor
LAWRENCE H. HANCOCK

By *Semmes & Semmes*

Attorney

Jan. 26, 1932.

L. H. HANCOCK
DISPENSING LIQUIDS

1,842,938

Filed Sept. 6, 1929

3 Sheets-Sheet 2

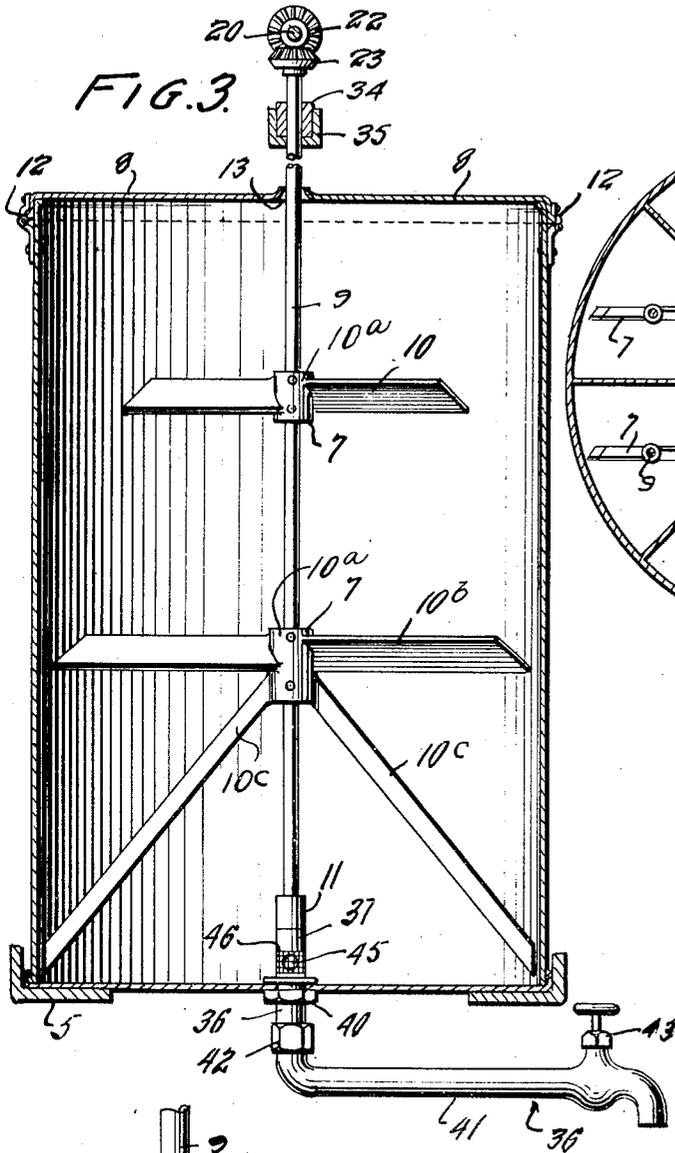


FIG. 6.

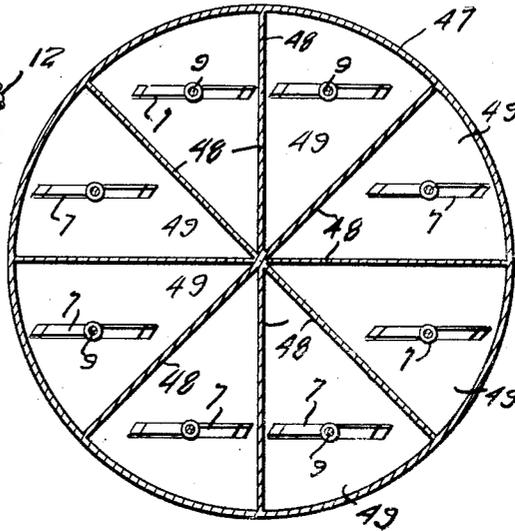


FIG. 7.

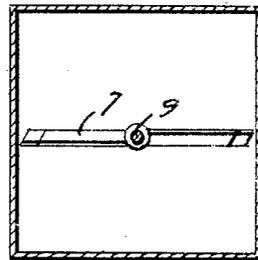
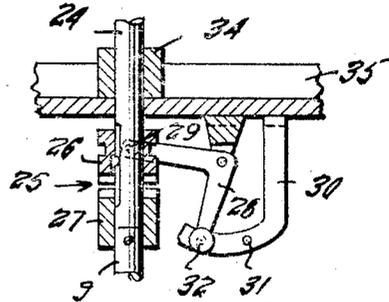


FIG. 5.

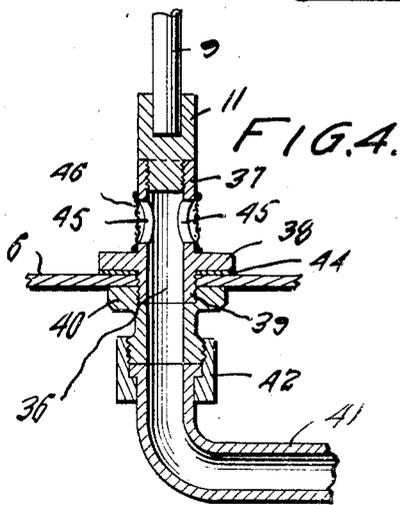


Inventor

LAWRENCE H. HANCOCK

By Semmes & Semmes

Attorney



UNITED STATES PATENT OFFICE

LAWRENCE H. HANCOCK, OF CHARLOTTE, NORTH CAROLINA

DISPENSING LIQUIDS

Application filed September 6, 1929. Serial No. 390,828.

The invention relates to a storing and dispensing method and more particularly has reference to the storing and dispensing of liquids in bulk.

5 In the storing and dispensing of liquids particularly, those possessing the characteristics of suspensions, the art has failed to accomplish any method whereby these liquids may be stored for considerable lengths of
10 time and be dispensed in a condition ready for immediate use. Particularly is this true in the storing and dispensing of paint.

At the present, paint is generally sold by large manufacturers to wholesale and retail
15 dealers. The paint is either placed in wooden barrels containing from 48 to 54 gallons or in 5 gallon cans. To obtain the paint from the barrels, a bung is provided or the whole head is taken off. In the cans previously mentioned, a sealed top or pressed
20 top is employed. In the former, when it is desired to sell an amount of paint less than that within the can, it is necessary to break the top by cutting it, and the dealer usually
25 has no way of resealing this can. When paint, either in cans or barrels, is ordered by various dealers, it is placed in their store-rooms until sold. Where the sales turn-over is small, the paint remains there for periods
30 of great length.

The disadvantages of storing and dispensing paint in the manner described above is at once apparent. As it is well known, when
35 paint is allowed to stand, even in a closed receptacle, the pigment and body will, within a short period, settle and harden. After this condition has arisen, it is very difficult to thoroughly remix all of the pigment with the vehicle of the paint. Consequently it may
40 be seen that a considerable loss of paint results.

Another disadvantage arises due to the fact that small jobbers and the average customers require paint in lots of less than 5
45 gallons. To obtain these, the merchant will open either a 5 gallon can or a barrel. In the case of the barrel, it is also practically impossible to refit the head with its former tightness in order to prevent the entrance of
50 air. As it is well known when paint is ex-

posed to air, oxidation occurs, resulting in a considerable loss.

It may also be observed that when paint is dispensed and stored as is mentioned above, the suspension is not thoroughly mixed so
55 that the paint cannot be applied at once consequently the user has to go through a tedious process of stirring, so as to thoroughly mix it.

At this point, it may be noted that with the
60 present practice employed for dispensing paint, manufacturers employ a great many small-size containers with labels affixed thereto. These are considerably more expensive
65 than large size containers when compared on a unit cost basis. This is principally due to the labor involved in constructing them which increases the cost of the paint. Hence it may
70 be observed that a method and apparatus for dispensing paint in bulk would be welcomed by the consumers who if they prefer, can furnish their own containers which would further decrease the ultimate cost of the paint.

The major object of this invention is to
75 devise a process and apparatus for the storing, agitating, dispensing and mixing a plurality of liquids.

An equally important object is the provision of a process and apparatus for storing
80 and dispensing liquids in a condition ready for immediate use.

A further object of the invention is to devise a process and apparatus whereby suspensions
85 may be stored and strained while being dispensed.

Still a further object of the invention is to devise a process for storing suspensions with the substantial exclusion of air.

Yet a further object of this invention is to
90 devise a novel container provided with an agitator.

A still further object of the invention is to devise an apparatus provided with draw-off
95 cocks having straining means associated therewith.

Yet another object of this invention is the provision of a system of liquid containers
100 for dispensing liquids.

Yet another object of the invention is the

provision of a system for storing, dispensing and mixing liquids having characteristics similar to paint and apparatus for doing the same which avoids the inherent defects of the present practice.

5 With these and other equally important objects in view, which may be incident to my improvements, the invention includes a special method and apparatus for storing, dispensing and mixing liquids in a condition
10 for immediate use, with the understanding that the several necessary steps comprising my process and the several elements of the apparatus may be varied without departing from the spirit and scope of the appended
15 claims.

It is the purpose of this invention to dispense liquid in a condition for immediate use. One method of practically effecting the concept of the invention is to provide a process and apparatus for storing the liquid with the substantial exclusion of air, frequently agitating the liquid and straining the liquid while dispensing it.

25 In order to make my invention more clearly understood, I have shown, in the accompanying drawings, means for carrying the same into practical effect without limiting the improvements in their useful applica-
30 tions to the particular constructions which, for the purpose of explanation, have been made the subject of illustration.

In the drawings:

35 Figure 1 is a horizontal view in section of the apparatus arranged upon the floor of a building.

Figure 2 is a cross sectional elevation taken along line 2—2 of Figure 1.

40 Figure 3 is a cross sectional view taken along the line 3—3 of Figure 1 and shows one of the containers in detail.

Figure 4 represents in detail the draw-off line and bearing member associated there-
45 with.

Figure 5 is a detailed view of the coupling mechanism employed with the apparatus.

Figure 6 represents a sectional plan view of a modified form for the arrangement of the apparatus.

50 Figure 7 shows a sectional plan view of a modified form of a container that may be used in the invention.

Figure 8 is a cross sectional elevation showing a building having the apparatus
55 mounted upon an upper floor with the draw-off lines descending to the first floor.

Figure 9 is a cross sectional view taken along the line 9—9 of Figure 8 and showing the arrangement of the dispensing valves.

60 Similar reference numerals represent like parts of the apparatus throughout the various views. Shown in Figure 1 is a cross sectional horizontal view of a building having walls 1, and an entrance or doorway 2,
65 entering into a room generally designated as

3. There is provided in the room a dispensing or store counter 4. Arranged along the walls of the room and also in the center are platforms or stands 5. These platforms
70 may be constructed of any desirable material such, for example, as concrete, wood or steel. A plurality of cylindrical containers or storage tanks 6 are positioned adjacently to each other so as to form a row upon each of
75 the platforms 5.

Each container 6, is provided with an agitator generally designated as 7, a cover 8, and a draw-off line 36. The agitator 7 comprises a shaft 9 having a plurality of blade elements secured thereto in any suitable manner. As
80 disclosed, an upper and lower set of blade elements are employed. The upper set of blade elements comprise a hub 10a with blades secured thereto in any desired manner, while the lower blade elements 10b are also secured
85 to a hub. In both instances the hubs are fastened upon the shaft 9 by means of set screws or the like, and the blade elements 10 and 10b may be given any pitch desired.

It should be noted that in addition to the blade elements 10b provided upon the lower hub, there are also formed auxiliary blade elements 10c. The blade elements 10c lie substantially within a vertical plane, and depend
90 downwardly from the hub and outwardly towards the bottom of the container, their lower ends almost touching the sides of the container. It should be noted that the lengths of the upper blades 10 are shorter
95 than those of the lower blades 10b. The purpose of this construction will hereinafter be described.

While only two sets of blade elements have been disclosed, it is to be understood that more may be employed without departing
105 from the spirit of the invention or the scope of the appended claims.

As it may be observed from Figure 3, the draw-off line 36 extends within the interior of each container for a substantial distance. Mounted within the upper end of the interior
110 portion 37 of the draw-off line is a bearing member 11. The bearing member may be mounted upon the draw-off line by having the portion 37 internally threaded so as to receive an externally threaded portion of the bearing member 11. However, it is obvious
115 that other methods for supporting the bearing member 11, upon the draw-off line may be employed if desired. The upper end of the bearing member is recessed and provided with a bearing into which one end of the agitator shaft 9 is adapted to be rotatably mounted.
120

It should be noted that the cover 8 for each container is divided and hinged to the walls of the storage tank at points directly opposite each other as shown at 12. The inner
125 portion of the two sides of the cover 8 are recessed so as to provide a passage way for the
130

agitator shaft 9. Passageway 13 also forms a suitable bearing for this portion of the shaft and packing rings may be employed so as to surround the recess, and substantially

5 exclude air from the container.

It has been pointed out that each container is provided with an agitator. In order to actuate these devices a power source 14 is employed. The driving shaft 15 of the power source may be belted or otherwise secured to a driven shaft 16. The shaft 16 is provided with suitable gears 17 adapted to mesh with similar gears 18 mounted upon coupling shafts 19. Coupling shafts 19 are connected to agitator drive shafts 20 by means of couplings 21. The shafts 20 are positioned above the rows of storage tanks and they have secured thereto a plurality of gears 22 adapted to mesh with gears 23 mounted upon the end of agitator coupling shafts 24. Interposed between each of the agitator coupling shafts 24 and the main agitator shafts 9 are suitable couplings 25.

Suitable bearings 33, are provided for the agitator drive shafts 20 and similar bearings 34 mounted upon a support 35 may be provided for the agitator shafts.

The couplings 21 and 25 comprise a driving shaft with a male member 26, slidably keyed thereto and a driven shaft with a female member 27 fixedly secured upon it. To operate the coupling, a bell crank 28 pivotally mounted at its center and secured as shown at 29 to the male member is employed. A suitable sector bar 30 secured to the support 35 and having slots 31 and a pin 32 is provided for maintaining the male member 26 in engagement and non-engagement position with the female member 27.

40 While I have shown and described a coupling for the mechanism comprising a female member adapted to be engaged by a slidably male member, it is to be distinctly understood that other forms of couplings such as clutches may be employed without departing from the spirit of the invention.

From an inspection of the drawings it is obvious that upon the operation of the power source 14, the shaft 17 will rotate the agitator drive shafts 20 and that these in turn will actuate the agitator shafts 9 with a consequent rotation of the blade elements. It is equally apparent that by the use of the couplings 21, one or more of the drive actuator shafts 20 may be rotated. Because of the couplings 25, it may be seen that any desired number of agitators may be operated in one or more of the container rows.

50 While I have shown each of the actuator drive shafts 20 and the main actuator shafts 9 provided with a coupling, it should be understood that these couplings may be dispensed with if desired and all of the shafts 20 and 9 driven at the same time. It is also

55 obvious that a greater or a lesser number of

rows of containers may be employed with the apparatus without departing from the scope of the invention.

As it has been pointed out the portion 37 of the draw-off line extends for some distance within the interior of each container. The bearing member 11 is mounted upon the upper end of this interior portion, while its lower end is flanged, as shown at 38 and is externally screw threaded at 39. The screw threads 39 are adapted to engage a screw threaded opening within the bottom of the container and they extend for a short distance beyond the container bottom. Provided to engage the screw threaded portion 38 which extends below the bottom of the container is a connecting member 40, to which is secured a swiveled elbow 41 by means of the coupling nut 42. At the end of the elbow opposite to that secured to the connecting member 40 is a suitable dispensing valve or draw-off cock 43 with operating handle therefor. To prevent the leakage of liquid within the container, a suitable washer or packing ring 44 is provided between the portion 37 of the draw-off line and the bottom of the container.

It should be noted that directly below the bearing member 11, there are positioned within the draw-off line a plurality of openings 45. Openings 45 are provided with a screen 46 which is adapted to strain any liquid passing therethrough.

Because of the openings 45, it is evident that any liquid within the container 6, will pass through the draw-off line 36, and through the elbow 41 to the valve 43 where it may be taken off from the container. It is also evident that by reason of the swiveled connections shown at 42, a plurality of elbows 41 may be positioned over a receiving receptacle so that it may be simultaneously filled from a plurality of storage tanks.

The process and the apparatus is of particular advantage in ameliorating the difficulties of present day practice in dispensing various liquids as will hereinafter appear. Various paints of different colors and grades are placed within the containers 6, by raising the divided top 8 of each tank and pouring the paint from the receptacles in which it has been received into said tank. The covers 8 are then closed, care being taken that the recesses 13 with packing rings provided therefor are snugly fitted around the agitator shafts 9 so as to prevent the entrance of air into the containers after being filled and consequently the oxidation of their contents. At frequent intervals, once a day or oftener, the power source 14 is operated to drive the agitators and hence maintain the paint in a thoroughly mixed condition so as to prevent the separation of the pigment from its vehicle. By reason of the couplings 21 and 25, it is evident that if all the storage tanks 6

are not filled, the agitators of any number of these in any desired row may be operated. As the blade elements are rotated, it will be appreciated that the paint or other liquid within the container will be thoroughly agitated. As it frequently occurs that suspended matter in a vehicle is subject to settling, the length of the blade elements are increased near the bottom of the container. In addition to this, the auxiliary blades 10c are provided so that substances which have settled at the bottom of the container may be thoroughly stirred and mixed with their vehicle.

When it is desired to dispense the paint from any container, its valve 43 is opened and paint is allowed to flow through the draw-off line 36. It is apparent by reason of the screen 46 that paint passing through the openings 45 into the draw-off line will be strained and any lumps of pigment prevented from passing into the draw-off line. The amount of liquid dispensed and the rate at which it is drawn off may be controlled by the valve 43.

There is no limitation upon the size of the containers or storage tanks 6 as it is possible, for example, to employ such sizes as 25, 50, 75, 100 gallons, etc. This feature depends upon the size the user desires. Moreover, it is possible to vary the size of the containers in a row and to have different size tanks in different rows.

When it is desired to mix several paints in one receptacle so as to obtain a color different from that possessed by either of these paints, the swiveled arms 41 of several tanks may be positioned above a receiving receptacle. If it is desired, hose may be attached to the valve outlet 43 of the various arms 41.

There is shown in Figure 6 a slightly modified form of the container which does away with the series of rows of storage tanks shown in Figure 1. In this modified form, a master container 47 of cylindrical outline is employed. It is obvious, however, that other geometrical outlines such, for example, as a square or rectangle may be used if desired. Within the master container 47 are a plurality of partitions 48 which form compartments 49. Mounted within each compartment 49 is an agitator similar to that shown in Figure 3. These agitators may be driven by individual motors or if it is desired they may be driven by a single motor through suitable gearing. As in the previous embodiment a substantially air-tight cover for each compartment 48 is provided so as to prevent the oxidation of the paint contained therein.

Disclosed in Figure 7 is a storage tank having a square outline. This type of container may be used in place of the cylindrical storage tank shown in Figure 1 or if it is desired this form may be made of a rectangular cross section.

Figure 8 discloses a different arrangement of the apparatus described in connection with Figures 1 and 2. In Figure 8, the apparatus is mounted upon an upper floor of a building 50 and there is shown a row of containers or storage tanks 6. The draw-off lines 36 from the tanks extend downwardly towards the first floor 51. The lower ends of the draw-off lines are provided with suitable elbows so that horizontal lead lines 52 may be taken through a support 53. Suitable dispensing valves 43 are provided at the ends of the lead lines 52. Where the lead off-line extends through the support 52, a suitable swiveled extension may be secured thereto and the valve 43 positioned upon the extension. In this manner, it is possible to simultaneously receive the contents of several of the storage tanks 6 within a suitable receiving receptacle placed below the draw-off cocks.

While I have described the process and the apparatus as being particularly applicable for the dispensing of paint, it should be understood that it may be used for any other kinds of liquid without departing from the spirit and scope of the invention.

From the foregoing description, it may be observed that I have provided a process and apparatus for storing and dispensing liquids in a condition ready for immediate use, which comprises frequent agitation of the liquid with a substantial absence of air and straining the liquids while dispensing them in desired quantities.

I claim:

1. A liquid dispensing apparatus comprising a container, a cover therefor provided with a recess, a draw-off line, one end thereof extending within the container, said interior end of the draw-off line adapted to support a bearing member, a rotatable shaft having one of its ends mounted in said bearing member, the other end thereof extending through said recess, a plurality of blade elements positioned on the shaft, means for actuating the shaft so as to agitate the liquid and means for straining the liquid while drawing it off.

2. A liquid dispensing apparatus comprising a storage tank, a cover therefor provided with a recess, a draw-off line, a portion thereof extending within the tank, the end of said interior portion adapted to support a bearing member, said interior portion of the draw-off line being provided with a plurality of openings, a screen for said openings, a shaft having a plurality of blade elements positioned thereon adapted to have one of its ends rotatably mounted in said bearing member, the other end thereof extending through the recess in the cover and means for actuating said shaft and blade elements so as to agitate the liquid.

3. A liquid dispensing apparatus comprising a container having a divided cover, each

70

75

80

85

90

95

100

105

110

115

120

125

130

portion of the cover being provided with a recess, said recesses cooperating when the cover portions are in their closed position to form a bearing for a rotatable shaft within the container, a draw-off line extending within the container, the interior end thereof having a bearing member positioned therein, the lower end of said rotatable shaft being positioned in said bearing member, a plurality of blade elements positioned on the shaft, means for actuating the shaft so as to agitate the liquid, and means for straining the liquid while drawing it off.

4. A liquid dispensing apparatus comprising a storage tank with a divided cover therefor, each divided portion of said cover being provided with a recess, packing for said recesses, a draw-off line having a portion thereof extending within the container, the end of said interior portion adapted to support a bearing member, said interior portion of the draw-off line having a plurality of openings, a screen for said openings, a shaft having a plurality of blade elements positioned thereon adapted to have one of its ends rotatably mounted in said bearing member, the other end thereof extending through said cover, the recesses formed in each divided portion thereof providing a bearing for the upper end of said shaft, said packing adapted to form a substantially air tight closure between the shaft and the cover, and means for actuating the shaft and blade elements so as to agitate the liquid.

5. A liquid dispensing apparatus comprising a container having a divided cover, each portion of the cover being provided with a recess, said recesses cooperating when the cover portions are in their closed position to form a bearing for a rotatable shaft within the container, a draw-off line extending within the container, the interior end thereof having a bearing member positioned therein, the lower end of said rotatable shaft being positioned in said bearing member, a plurality of hubs secured to the shaft so as to rotate therewith, blade elements secured to each hub, the blade elements on the lower hub being of a greater length than those on the upper hub, means for actuating the shaft so as to agitate the liquid, and means for straining the liquid while drawing it off.

6. A liquid dispensing apparatus comprising a container having a divided cover, each portion of the cover being provided with a recess, said recesses cooperating when the cover portions are in their closed position to form a bearing for a rotatable shaft within the container, a draw-off line extending within the container, the interior end thereof having a bearing member positioned therein, the lower end of said rotatable shaft being positioned in said bearing member, a plurality of hubs secured to the shaft so as to rotate therewith, the upper hub provided with blade

elements, the lower hub provided with blade elements of greater length than those of the upper hub, and also with auxiliary blade elements which depend therefrom and project outwardly towards the sides of the container, means for actuating the shaft so as to agitate the liquid, and means for straining the liquid while drawing it off.

7. In a liquid dispensing apparatus a plurality of containers positioned in series, one adjacent the other, each of said containers having a cover provided with a recess, a draw-off line extending within each container, one end of each draw-off line having a bearing member supported therein, a rotatable shaft having one of its ends mounted in each of said bearing members, the other end of said shaft extending through the recess in said cover, a plurality of blade elements positioned on each shaft, means for actuating each of said shafts and blade elements, and means for straining the liquid from each container while drawing it off.

8. In a liquid dispensing apparatus having a plurality of containers, each of the containers having a cover formed of divided portions provided with a recess, packing for said recesses, separate draw-off lines extending within each container, the inner end of said lines being provided with bearing members adapted to receive one end of a rotatable shaft positioned in each container, the other end of each shaft extending through the top of its container, said recess in each container top forming a bearing for each shaft, said packing forming a substantial air tight closure between the shaft and the cover, each of said shafts having a plurality of blade elements positioned thereon, means for actuating any desired number of said shafts for agitating the liquids in the containers, and means for straining the liquids while drawing them off.

9. In a liquid dispensing apparatus having a plurality of rows of containers, each of said containers being provided with a top formed of divided portions, each of said divided portions being provided with a recess, a draw-off line for each container, the inner end of each draw-off line extending within the container and supporting a bearing member, a rotatable shaft extending within each container, one end of each shaft being supported in the bearing member, the opposite end of each shaft extending through the top of its container, said recesses in each container top forming a bearing for the upper end of each shaft, a plurality of blade elements positioned on each shaft, means for actuating any number of shafts in any of the rows of containers so as to agitate the liquids within the containers, and means for straining the liquid within each container while drawing it off.

10. In a liquid dispensing apparatus com-

70

75

80

85

90

95

100

105

110

115

120

125

130

prising a plurality of containers, a top
 formed of divided portions for each con-
 tainer, each portion of said top being pro-
 vided with a recess, a draw-off line extend-
 ing within each container, the inner end
 5 thereof adapted to support a bearing mem-
 ber, a rotatable shaft for each container hav-
 ing one of its ends mounted in said bearing
 member, the other end extending through
 the recesses in said top, a draw-off cock for
 10 each container, said cocks being so construct-
 ed that liquid from a plurality of containers
 may be drawn off into a receptacle, means
 for actuating the rotatable shafts mounted
 within each container so as to agitate the
 15 liquid therein, and means for straining said
 liquid while drawing it off.

In testimony whereof I affix my signature.
 LAWRENCE H. HANCOCK.

20

25

30

35

40

45

50

55

60

65