Oct. 18, 1927. 1,646,102

C. L. OSTRANDER

GASOLINE CLARIFIER

Filed March 2, 1927 2 Sheets-Sheet 1

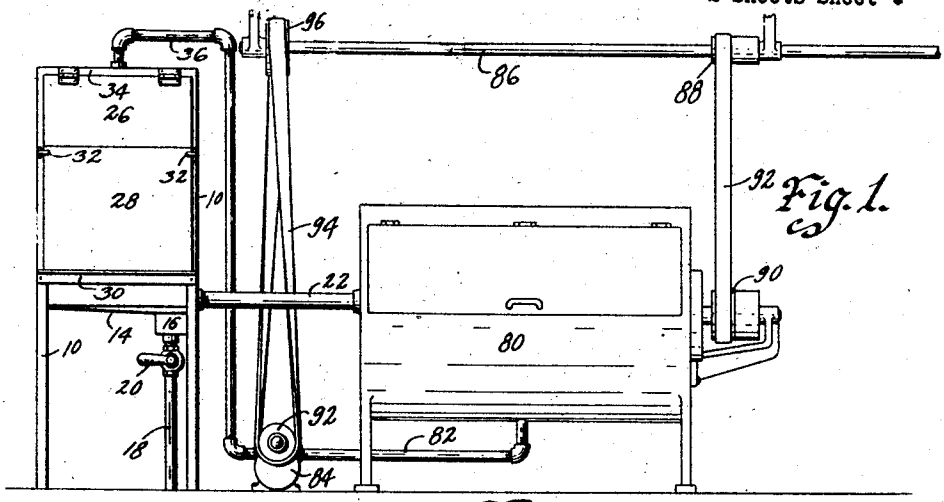


Fig. 1.

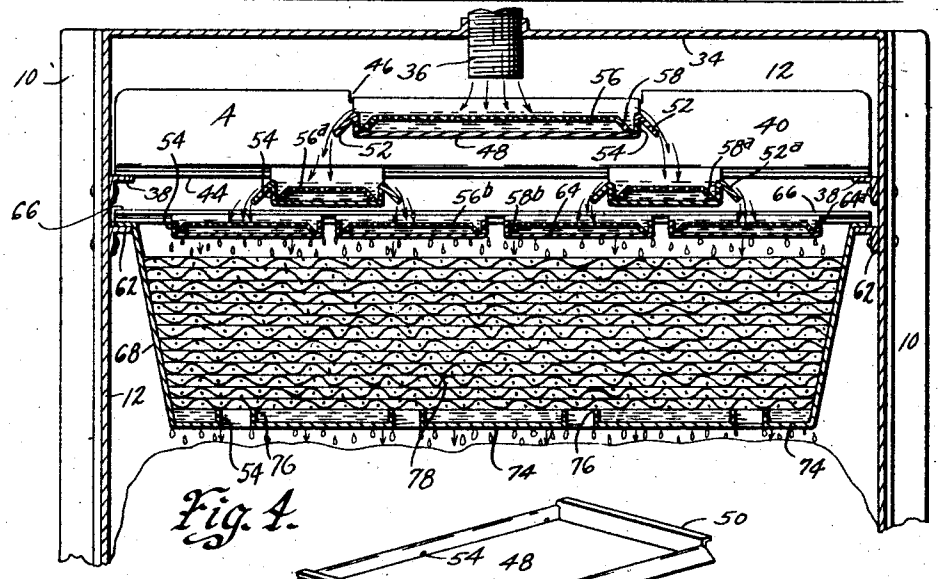


Fig. 4.

Fig. 5.

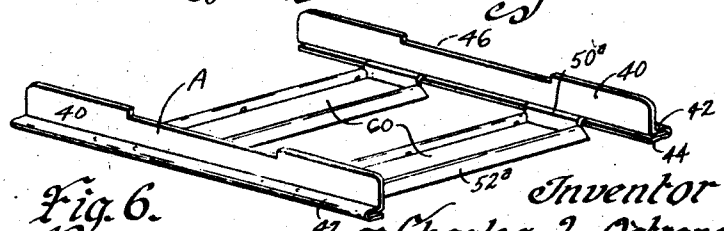


Fig. 6.

Witness
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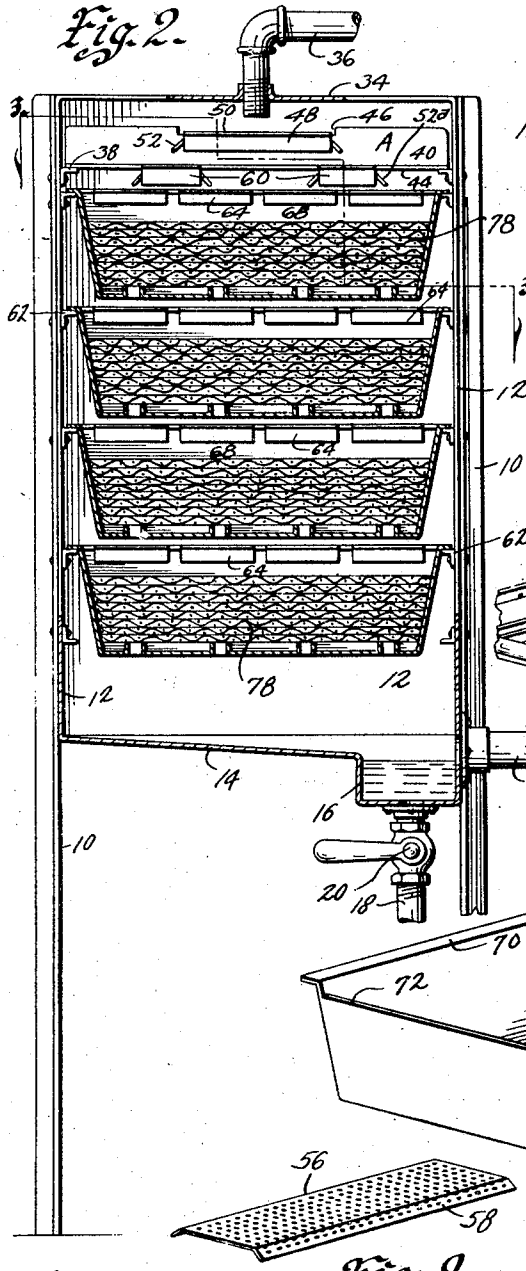
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C. L. OSTRANDER

GASOLINE CLARIFIER

Filed March 2, 1927 2 Sheets-Sheet 2

Fig. 2.



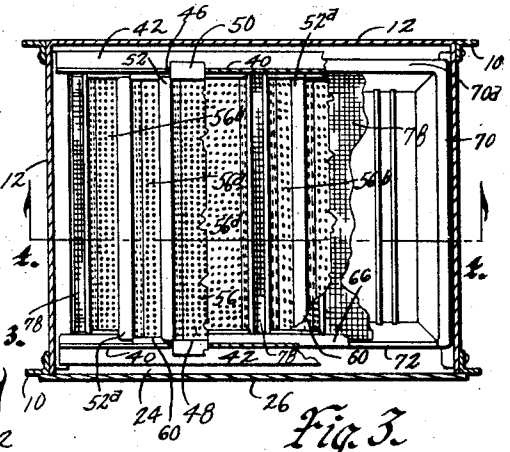


Fig. 3.

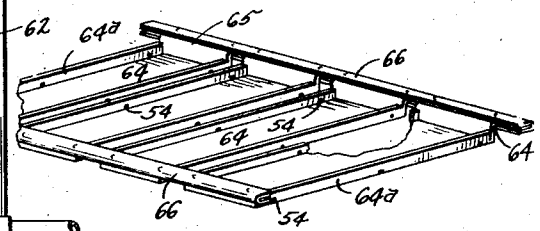


Fig. 7.

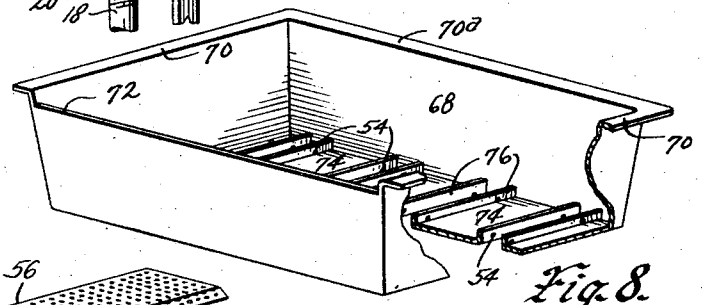


Fig. 8.

Fig. 9.

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Patented Oct. 18, 1927. 1,646,102

UNITED STATES PATENT OFFICE.

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GASOLINE CLARIFIER.

Application filed March 2, 1927. Serial No. 172,028.

The object of my invention is to provide a gasoline clarifier of simple, durable and inexpensive construction.

More particularly, it is my object to provide a gasoline clarifier of the type in which gasoline is passed through a series of settling pans and through a series of fabric filters, whereby the impurities in the gasoline will be taken out.

In this connection, it is my purpose to provide a clarifier which can be used without chemicals or special filtering material that must be constantly replaced.

An additional purpose of my present invention is to provide a clarifier which can be used in a continuous operation.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my gasoline clarifier, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of a clarifier embodying my invention installed in connection with a washing machine and pump.

Figure 2 is a vertical, sectional view through the clarifier.

Figure 3 is a detail, sectional view taken on the line 3—3 of Figure 2.

Figure 4 is an enlarged, sectional view taken on the line 4—4 of Figure 3.

Figure 5 is a perspective view of one of the settling pans.

Figure 6 is a similar view of a frame and a settling pan supported thereon.

Figure 7 is a perspective view of other settling pans and their supporting frame members.

Figure 8 is a perspective view of a filtering pan, parts being broken away and parts being shown in section; and

Figure 9 is a perspective view of one of the perforated plates used in the settling pans.

It is well known that in clothes cleaning plants, it is the custom to wash clothes in gasoline or other washing and cleaning fluids.

I will describe my machine as though used for gasoline, although it can be used with cleaning fluids bearing other names.

The gasoline in which the clothes are washed must be frequently clarified for the purpose of taking out the heavy dirt in suspension therein and the greases, oils, fatty acids and dye matter. It is especially necessary to take out the greases and oils, which will otherwise become rancid and give a disagreeable odor to the clothes.

Heretofore various methods have been used for cleaning the gasoline.

The centrifugal cleaner takes out only the heavy dirt in suspension, but does not take out the greases and oils.

Filterers that use fuller's earth and the like are too slow and the replacing of the filtering material is undesirably expensive.

The settling tank method is too slow and does not take out the greases and oils.

Chemical clarifiers are likely to leave a little caustic in the gasoline, which will then burn the clothes. To avoid this, most of the chemical clarifiers are used with filterers, which make the machines expensive and slow their operations down.

The distillation method sometimes employed is very slow, relatively expensive, and takes out some of the good qualities of the gasoline.

I have provided a clarifier, which is free from the objections to all of the earlier methods, as will be hereinafter again referred to.

My clarifier is preferably supported on legs indicated in the accompanying drawings by the reference numeral 10. It comprises a suitable case 12, the bottom 14 of which is preferably inclined slightly toward one side and provided with a sump 16 at its lowermost part. A cleanout pipe 18 in which is a control valve 20 leads from the bottom of the sump 16.

Near the bottom of the case, there leads therefrom an ordinary takeoff pipe 22.

The case has at one side an opening 24, extending preferably from the top substantially toward the bottom of the case, but not entirely to the bottom. The upper part of this opening is normally closed by a door 26 hinged at its top and the lower part by a cover plate 28, which rests on the flange 30, and may be held in place by suitable catches 32.

By removing the plate 28 and raising the door 26 access can be had freely to the interior of the case 12.

The case 12 has the top 34. The gasoline supply pipe 36 discharges through the top 34 preferably at about the center of the case.

Below the top 34, a suitable distance, the side walls of the case 12 on their interior support angle iron brackets 38, as shown for instance in Figures 2 and 4. These brackets 38 support a pair of spaced frame members, indicated at A, in Figures 4 and 5. Each frame member A consists of an upright strip 40 having at its lower edge a laterally projecting portion 42 bent under and back on itself as at 44 to provide a channel.

The channels of the opposite members A are arranged to open towards each other, as shown in Figure 5. The ends of the channel members 44 rest on the angle irons 38.

The upper edges of the strips 40 have opposite notches 46 just below the discharge end of the pipe 36. A settling pan 48 is supported by means of flanges 50 at its ends, which are received in the slots 46, as shown in Figure 4 for example, and rest on the strips 40.

At the sides of the pan 48 are downwardly and outwardly inclined flanges 52.

In the walls of the pan 48 are small drain holes 54.

In the pan 48 is a perforated plate 56, which has at its side edges downwardly and outwardly projecting flanges 58, whereby the main portion of the plate 56 is supported spaced above the bottom of the pan 48.

The gasoline drops from the pipe 36 upon the plate 56 and runs through the perforations therein to the bottom of the pan 48 and then out through the perforations in the flanges 58 and over the side edges of the pan, which are a little lower than the ends of the pan.

A considerable portion of the dirt and muck in the gasoline settles in the pan 48 and by providing the plate 56, there is afforded a body of quiet gasoline below that plate.

I have found that where there is used a vertical-walled pan, the gasoline runs over the side walls and then instead of dropping off at the sides of the pan, travels underneath the pan and drops off at a great variety of points under the bottom of the pan.

In order therefore to be sure that the gasoline running over the walls of the pan 48 may be dropped into the pans below, I provide the side walls of the pan 58, which are a little lower than the end walls with the flanges 52 already mentioned.

The gasoline which runs over the side walls of the pan 48 drops into pans 60, which are substantially similar in construction but are somewhat narrower than the pan 48. The pans 60 have at their ends the flanges 50^a similar to the flanges 50 projected between the members 42 and 44 and thus supported between the opposite frame members A on the angle brackets 38.

The settling pans 60 have at their side edges downwardly and outwardly inclined flanges 52^a, similar to the flanges 52.

In the pans 60 are perforated plates 56^a similar to the plates 56, except as to width, and provided with flanges 58^a similar to the flanges 58. Below the brackets 38 are similar brackets 62.

The pans 60 discharge at their sides into settling pans 64. The pans 64 have at their ends flanges 65 similar to the flanges 50 and 50^a received between the walls of channel bars 66, which are supported at their ends above the brackets 62.

The side walls of the pans 64 are vertical, as indicated at 64^a in Figure 7. Otherwise the pans 64 and 60 are substantially alike in structure.

In the pans 64, I arrange perforated plates 56^b similar in structure to the plates 56, provided with the downwardly and outwardly inclined flanges 58^b at their side edges similar to the flanges 58.

It will be understood that the pans 60 and 64 have the small drainage holes 54 for the same purpose as does the pan 48.

On account of the construction of the flanges 52, the pan 48 drops its overflow gasoline directly upon the plates 56^a of the pans 60, and on account of the flanges 52^a, the overflow from the pans 60 discharges directly into the respective pans 64.

The pans 64, however, have the vertical side edges 64^a, and I find that where such pans are used, the gasoline does not drop along the edge, but travels along the bottom of the pan, and if the supply is properly controlled, falls off in drops scattered all over the bottom of the pans 64.

I will now describe the filtering and settling members below the pans 64.

Of course, it will be understood that my clarifier may be made in different capacities.

I have illustrated in my drawings a clarifier with one pan 48 discharging into two pans 60, which in turn discharge into four pans 64. The pans 48, 60 and 64 are shallow as shown.

Below the pans 64 is a vertical series of pans 68. At what may for convenience be called the ends of the pans 68 are the laterally projecting flanges 70 and a similar flange 70^a is provided at the rear wall, while what may be called the front wall is notched down from its upper edge, as at 72, to permit the pans 64 to be slid in.

Above each pan 68 is a set of pans 64, such as that already described.

Each pan 68 has a bottom, which is really formed of a series of pans 74 arranged side by side and slightly spaced from each other in such a way as to be staggered with relation to the pans 64 below them. (See Figure 2).

The pans 74 may be formed by providing slits in the bottom of the pans 68 and then bending up the vertical flanges 76, which are provided with the usual drain holes 54. In

the pans 68, I provide a plurality of layers of loosely woven fabric 78.

In the practical operation of my improved clarifier, the gasoline may be pumped into it from some source, such as a storage tank and taken from it to a receiver, such as another storage tank.

I have, however, illustrated in the present installation a clarifier assembled with a washing machine 80. The pipe 82 leads from the bottom of the washing machine to a suitable pump 84, which discharges to the pipe 36 already mentioned. The pipe 22 leading from the bottom of the clarifier is arranged to discharge into the washing machine 80.

In the particular installation here illustrated, the washing machine is operated from a line shaft 86. On the shaft 86 is a pulley 88 in line with a pulley 90 for operating the machanism of the washing machine. A belt 92 travels on the pulleys 88 and 90.

The pump 84 has a pulley 92 which is operated by means of a belt 94 on the pulley 96 on the shaft 86.

In the practical operation of the clarifier, it will be observed that when the washing machine is operated, gasoline from the lower part thereof will be drawn by means of the pump 84 through the pipe 82 and discharged by way of the pipe 36 into the top of the clarifier.

It will, of course, be understood that the pump is regulated at a proper speed for securing the most efficient operation of the pump.

The gasoline is discharged upon the perforated plate 56 in the pan 48. Part of the gasoline passes through the plate 56 and deposits sediment and impurities in the pan 48. Of course, part of the gasoline will travel over the side walls of the pan 48 without passing through the plate 56.

From the pan 48, the gasoline passes over the sides thereof and drops upon the plates 56^a in the pans 60. In these pans more deposit of sediment and muck is made, and from them the gasoline is discharged upon the plates 56^b in the pans 64.

In those pans more impurities are left, and from them the gasoline travels over the side walls and thence downwardly and along the bottoms of the pans 64 and drops off in drops as illustrated in Figure 4.

By the time the gasoline leaves the pans 64 a large part of the impurities in suspension will have been taken out and left in the pans above in the form of a muck, which gradually becomes thicker as more gasoline is clarified.

From the pans 64, the gasoline drops upon the fabric filter members 78 through which it travels to the pan members 74 of the upper pan 68. From the upper pan 68, the gasoline drops into the next lower series of pans 64 and this process is repeated as many times as may be desired.

I have shown in my drawings four sets of the pans 68 and the pans 64, this being the number I have used in actual practice.

I find that the impurities are taken out so that the gasoline can be used over and over again.

In actual practice, I clarify gasoline by a continual process at the rate of two thousand gallons per day.

At the finish of a day's run, if the pump is stopped and the clarifier allowed to stand idle for about ten minutes to permit the gasoline to drip from the fabric filter members, then the side 28 may be removed and the door 26 lifted off, and the filter and settling members taken out and cleaned.

For instance, the pan 48 is taken out and the muck cleaned therefrom and the same is true of the pans 60 and 64 and 68.

The cloths 78 are preferably simply run through the washer and taken out and put through the extractor and used again.

I find that a little better results are secured if the clothes are dampened before the first gasoline is run through them. The same results, however, can be accomplished by a little water in the gasoline.

It will thus be seen that I have provided a clarifier, which is very simple in construction and easy and simple to operate. No special skilled labor is needed for its operation, and it needs no particular care during the day.

It operates automatically when the washing machine to which it is attached is being used.

At the end of the day, the muck and dirt may be cleaned out and the clothes washed, and the parts replaced, and the clarifier is ready for another day's run.

If any water is in the gasoline, it collects in the sump 16 from which it may be readily removed.

In the course of time, a very small amount of dirt collects in the sump 16, which, of course, can be easily washed out. The capacity of such a clarifier may be varied by simply adding units or increasing the size of the various pans.

Changes may be made in the materials used, size and arrangement of the parts, and the details of their construction without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents, which may be reasonably included within their scope.

I claim as my invention:

1. In a clarifier, a plurality of settling pans arranged so that gasoline may be discharged from one to another, a plurality of containers with fabric filter members therein, so that

gasoline may be conducted from one container to another, said containers having spaced settling pans at their bottoms.

2. In a clarifier, a vertically arranged series of settling pans arranged to discharge from one into another, a vertically spaced series of pans having therein fabric filters, said second described series being arranged to discharge from one into the other in vertical succession and having in their bottoms spaced settling pans.

3. In a clarifier, a settling pan having side edges with downwardly and outwardly projecting flanges, and settling pans arranged below said edges.

4. In a clarifier, a settling pan having side edges with downwardly and outwardly projecting flanges, settling pans arranged below said edges, and means for filtering gasoline discharged from the last-named settling pans.

5. In a clarifier, a vertically arranged series of settling pans arranged to discharge from one into another, a vertically spaced series of pans having therein fabric filters, said second described series being arranged to discharge from one into the other in vertical succession and having in their bottoms spaced settling pans, said settling pans having therein raised perforated plates.

6. In a clarifier, a case, a series of vertically spaced supports therein, said case having a closure member at its side, settling pans slidably mounted on said supports, a vertical series of pans slidably mounted on said supports having filtering means therein, and a series of settling pans supported at the upper part of each of said last series of pans and received therein.

7. In a clarifier, a case, a series of vertically spaced supports therein, said case having a closure member at its side, settling pans slidably mounted on said supports, a vertical series of pans slidably mounted on said supports having filtering means therein, said last series of pans having spaced settling pans in their bottoms.

8. In a clarifier, a case, vertically spaced supports therein, frame members mounted on a spaced pair of said supports having notches in their upper portions, a settling pan provided with flanges received in said notches and detachably supported settling pans supported on the lower parts of said frame members below the side edges of the upper settling pan.

9. In a clarifier, a case, vertically spaced supports therein, frame members mounted on a spaced pair of said supports having notches in their upper portions, a settling pan provided with flanges received in said notches and detachbly supported settling pans supported on the lower parts of said frame members below the side edges of the upper settling pan, said upper settling pan having side walls of less height than its end walls provided with downwardly and laterally projecting flanges above the lower settling pans.

Des Moines, Iowa, February 24, 1927.

CHARLES LEE OSTRANDER.