

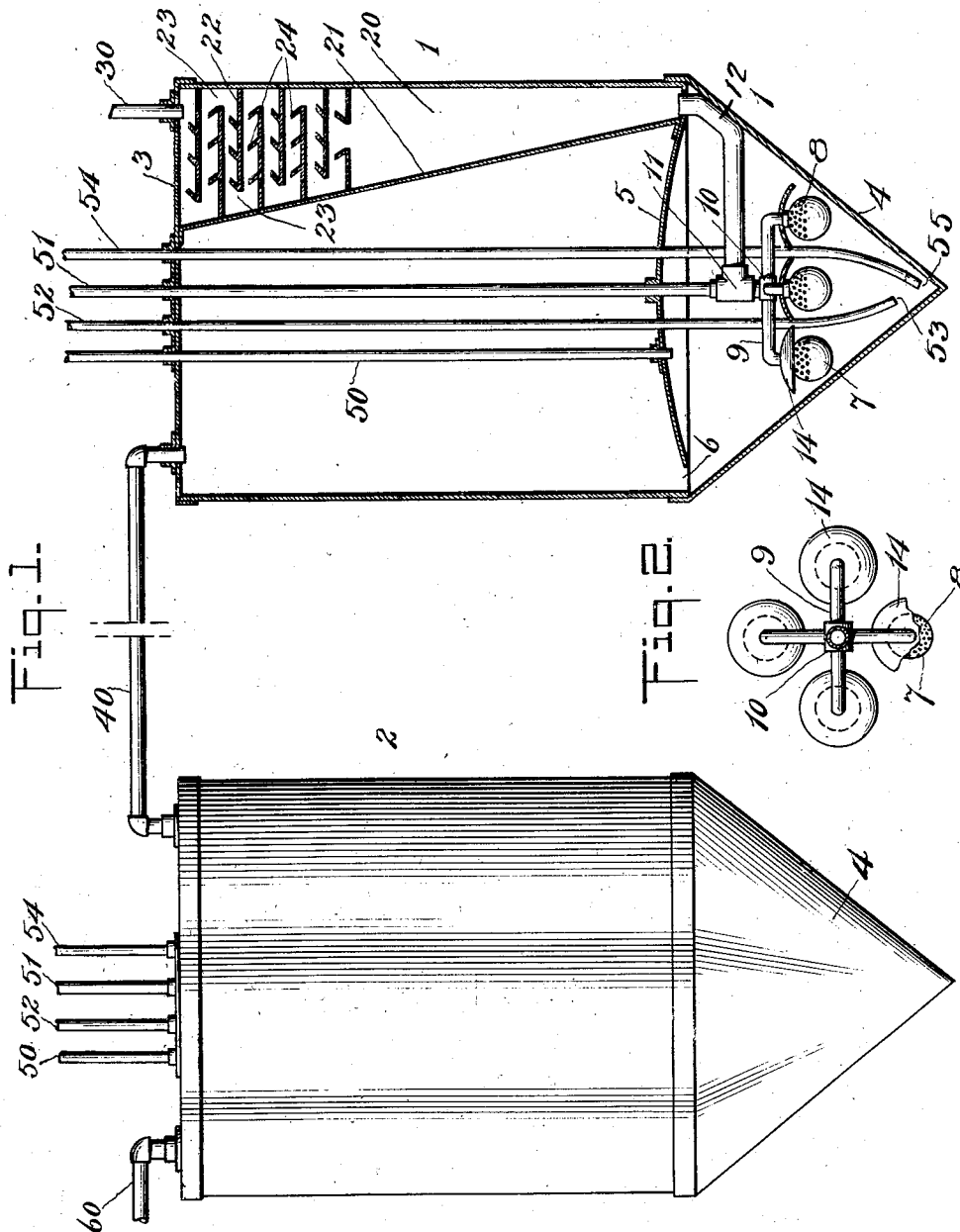
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APPARATUS FOR RECLAIMING GASOLINE

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APPARATUS FOR RECLAIMING GASOLINE.

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To all whom it may concern:

Be it known that I, ARCHIBALD DONALD STEWART, a citizen of the United States, and resident of Westbury, Long Island, in the county of Nassau and State of New York, have invented certain new and useful Improvements in Apparatus for Reclaiming Gasoline, of which the following is a specification.

10 My invention relates to appliances or apparatus for purifying or reclaiming gasoline and similar cleansing liquids after they have been employed for cleaning purposes so that the liquids can be reused, usually under modern conditions in a substantially continuous system of circulation from the cleaning or washing apparatus to the reclaiming or purifying apparatus and back again, or sometimes with an interposed storage tank.

15 While the invention is here exemplified by structure especially adapted for cleaning gasoline or similar light hydrocarbons, it is not necessarily limited as to its utility, but may be employed wherever conditions are substantially similar.

20 An important object of the invention is to provide means to first consolidate, or to a considerable extent separate the contained greases from the dirty cleansing liquid, and to then subject the partially separated or collected greases to an alkaline solution to convert or fix them and separate them finally from the cleaning liquid.

25 Another object is to introduce the dirty gasoline into an alkaline solution or other liquid for the removal of grease or other impurities without unduly agitating or disturbing the cleansing solution or liquid, and in such a way that the grease or other impurities will collect in a sump from which they are easily removable.

30 A further object is to provide easy means for cleaning pipes or other passages of the apparatus and also for agitating the waste material in the sump and removing it.

35 The invention consists in apparatus or structures for realizing the above stated and other objects and advantages, as sufficiently further explained hereafter.

40 In the accompanying drawings;

Figure 1 shows apparatus embodying the invention in one form, two cleaning appliances being shown in series, with one of them in section.

45 Figure 2 is a detail in top plan of the

cleaning-liquid injecting or distributing device.

The apparatus as here embodied consists of suitable parts or devices mainly arranged within two tanks, 1 and 2, which are conveniently of circular cross section. The internal structure of both tanks may be substantially similar or identical, although the mode of using them when arranged in series in the system, may be somewhat different as sufficiently explained hereafter.

As sufficiently shown in connection with tank 1, each cylindrical tank body has a top or header 3, and at the bottom a sump 4 which is conveniently, although not necessarily, in inverted conical form. The tanks are often buried in the ground; otherwise, when arranged above-ground suitable supports will be provided.

Between the sump and the main tank interior is a substantially horizontal partition plate 5, which may be moderately dome shaped, as shown. Connection from the sump to the main tank is afforded by an opening 6 at one side of the partition.

50 Suitable purifying liquid or solution is placed in each sump. Usually an alkaline solution, such as caustic soda, is placed in the sump of tank 1, mainly for the purpose of removing grease from the cleansing liquid, while water may be placed in the sump of tank 2 to remove other extraneous matter, sufficiently described as non-greasy.

To properly introduce the cleaning liquid into the sump without undue disturbance of the liquid or solution therein, I provide a suitable number of distributing devices, which, in the present case, are specifically in the form of hollow balls 7, provided with upwardly directed discharge apertures 8, which may occupy substantially the upper half, or somewhat less, of the ball surface. A pipe 9 is connected to each ball at the top and all these pipes are connected to a 4-way coupling 10, and this in turn is connected by a suitable pipe fitting 11 to a horizontal pipe 12. The dirty cleaning liquid may in some cases be conducted directly to the distributing balls by a suitable outward connection to pipe 12, but otherwise, and preferably in most cases, the liquid is first conducted to a preliminary separating apparatus or chamber, as further described hereafter.

Desirably, a shield or baffle plate 14 is located

ated above each distributing ball and the discharge apertures thereof, these baffle plates being desirably of inverted, dished or part-spherical form, and they are conveniently supported upon vertical portions of the pipes 9.

Desirably, a preliminary or intermediate chamber 20 is provided in one or both of the tanks. This may be formed by a partition 21 which is desirably arranged so that the upper portion of the preliminary chamber will be of relatively large area, and the chamber may then taper down to the point of connection to pipe 12. A plurality of horizontal partitions or baffle plates 22 are arranged in the upper portion of the intermediate chamber, communicating openings 23 being provided in preferably staggered arrangement; and desirably, cleats or raffle flanges 24 are provided on the upper surfaces of these plates.

The dirty cleaning liquid is introduced through a pipe 30 which, in this instance, discharges above the upper partition or separating plate 22 in intermediate chamber 20. Since tank 1 is usually the first in the series, if more than one tank is employed, the cleaning liquid as it enters contains not only a considerable quantity of extraneous matter which comes under the general heading of non-greasy dirt, but also contains a large amount of various heavy oils or greases extracted from fabrics or garments. In the flow of the liquid over the raffle flanges, and the plates 22, in the circuitous course provided by the staggered arrangement of the communicating openings 23, the liquid is thoroughly stirred or agitated and the grease is to a great extent collected, agglomerated or separated in a physical sense from the gasoline; or otherwise stated, the grease is collected into particles or lumps of greater or less size, which pass along with the gasoline through pipe 12 to the distributing balls 7 and out through their discharge openings, which direct the liquid upward toward and against the baffle plates 14.

By reason of the considerable number of distributing balls and the large number of relatively small openings therein, and further by reason of the baffle plates which check the course of the discharged liquid and divert it downward through the caustic solution, the flow of the dirty and greasy liquid is at moderate speed, and undue agitation of the purifying solution is avoided, while at the same time a very intimate contact of the dirty hydrocarbon and the grease therein with the cleansing solution is insured. The grease is converted or solidified by the caustic solution, this operation being greatly facilitated by the previous partial separation or agglomeration of the grease above referred to. The separated grease remains in the sump while the gasoline containing

more or less non-greasy dirt rises through aperture 6 toward the top of the tank, from which it is taken off through a pipe 40 to tank 2, in which the operations may be similar, except that in some cases the preliminary or initial separating chamber 20 may be omitted.

A vent pipe 50 is desirably provided, leading from any suitable outlet point through header 3 and through partition plate 5 to a point of connection with the sump, to take off air or accumulated gases. A steam pipe 51 is also desirably provided, leading from any desirable source of steam under suitable pressure, through the header and partition 5 to a point of connection with pipe fitting 11. At suitable intervals steam may be admitted through pipe 51 to pipes 9 and balls 7 to clear from them and the discharge openings 8, any accumulated grease or other obstructing material.

A steam pipe 52 is also desirably provided, leading to a discharge point 53, somewhat above the bottom of the sump, and a cleaning pipe 54 is also provided, having its opening 55 located near the sump bottom. Steam is admitted at intervals through pipe 52 to agitate and loosen the accumulated grease or other material in the sump, which is then drawn off through pipe 54.

Fresh caustic solution may be introduced into the sump in any convenient way, for instance, by pouring it through pipe 30 by any suitable valve connection; or a separate opening may be provided in the intermediate chamber 20 for this purpose.

The pipe connections to tank 2 may be substantially similar, and exterior portions of the pipe are identified by the same numerals as the corresponding pipes of tank 1.

The principal function of tank 2 is to remove non-greasy matter from the cleaning liquid; otherwise the operation is substantially the same as explained in connection with tank 1. The purified cleaning liquid is discharged from tank 2 through a pipe 60 to a storage tank or directly to a cleaning apparatus, and suitable pumps are provided as necessary for the circulation of the liquid. The present invention does not relate to the general cleaning installation or to the circulating system thereof, and such details are therefore not shown.

After considering this exemplifying embodiment, persons skilled in the art will understand that many variations may be made within the scope of the invention, and I therefore contemplate the employment of any structures that are properly within the scope of the appended claims.

What I claim is:

1. Apparatus of the class described, comprising a tank, a partition defining a sump at the lower end of the tank and having an opening for communication between the

sump and tank, a plurality of distributors substantially symmetrically arranged in the sump, a pipe fitting and pipe branches leading therefrom to the distributors, a preliminary chamber connected to said pipe fitting, means for supplying dirty cleaning liquid to the preliminary chamber, and means in said chamber for effecting preliminary separation of extraneous matter from the cleaning liquid.

2. Apparatus of the class described, comprising a tank, a partition defining a sump at the lower end of the tank and having an opening for communication between the sump and tank, a plurality of distributors substantially symmetrically arranged in the sump, a pipe fitting and pipe branches leading therefrom to the distributors, a preliminary chamber connected to said pipe fitting, means for supplying dirty cleaning liquid to the preliminary chamber, means in said chamber for effecting preliminary separation of extraneous matter from the cleaning liquid, and a steam pipe connected to said pipe fitting to clear out the distributors and their connecting pipes and discharge openings.

3. Apparatus of the class described, comprising a tank, a partition defining a sump at the lower end of the tank and having an opening for communication between the sump and tank, a plurality of distributors symmetrically arranged in the sump, a pipe fitting and pipe branches leading therefrom to the distributors, a preliminary chamber connected to said pipe fitting, means for supplying dirty cleaning liquid to the preliminary chamber, means in said chamber for effecting preliminary separation of extraneous matter from the cleaning liquid,

and a vent pipe communicating with the sump close to said partition.

4. Apparatus of the class described, comprising a tank, a partition defining a sump at the lower end of the tank and having an opening for communication between the sump and tank, a plurality of distributors symmetrically arranged in the sump, a pipe fitting and pipe branches leading therefrom to the distributors, a preliminary chamber connected to said pipe fitting, means for supplying dirty cleaning liquid to the preliminary chamber, means in said chamber for effecting preliminary separation of extraneous matter from the cleaning liquid, and a discharge pipe and a steam pipe communicating with the sump near the bottom thereof.

5. Apparatus of the class described, comprising a tank, a partition defining a sump at the lower end of the tank and having an opening for communication between the sump and tank, a plurality of distributors symmetrically arranged in the sump, a pipe fitting and pipe branches leading therefrom to the distributors, a preliminary chamber connected to said pipe fitting, means for supplying dirty cleaning liquid to the preliminary chamber, means in said chamber for effecting preliminary separation of extraneous matter from the cleaning liquid, a vent pipe communicating with the sump close to said partition, and a steam pipe connected to said pipe fitting to clear out the distributors and their connecting pipes and discharge openings.

Signed at New York in the county of New York and State of New York this 17th day of January A. D. 1924.

ARCHIBALD DONALD STEWART.