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PORTABLE CENTRIFUGAL MACHINE

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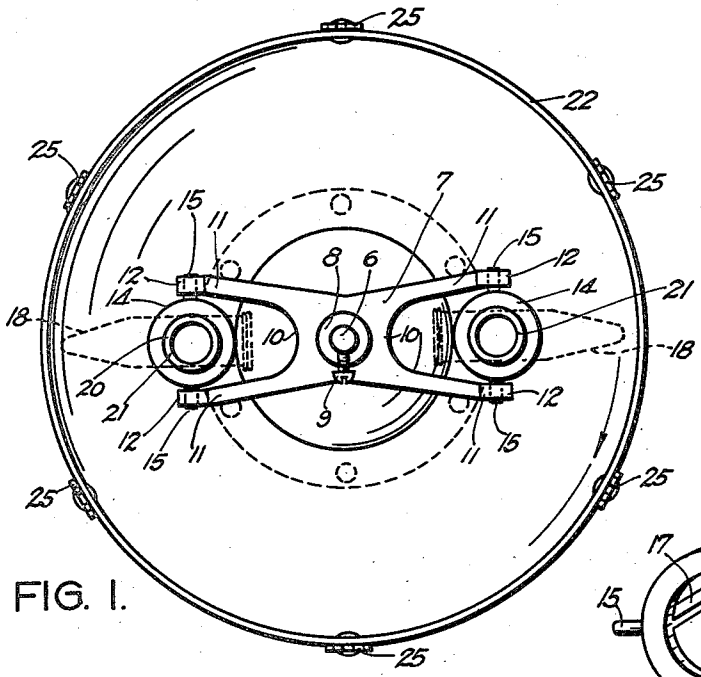


FIG. 1.

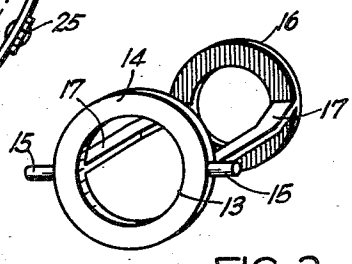


FIG. 3.

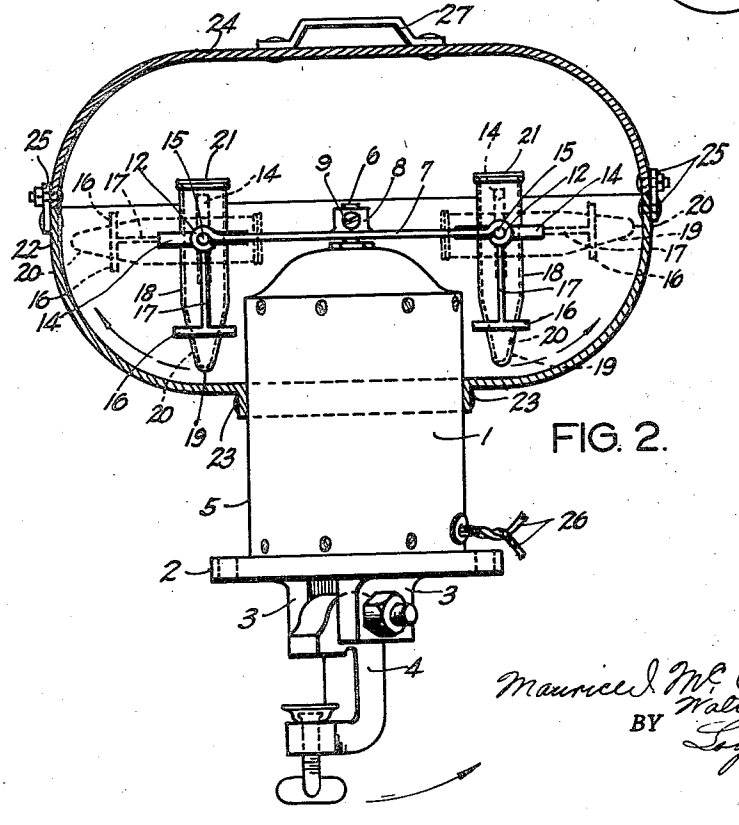


FIG. 2.

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PORTABLE CENTRIFUGAL MACHINE

Application filed July 29, 1929. Serial No. 382,056.

Our invention relates to centrifugal machines for separating the heavier from the lighter portions of liquids.

The objects of our invention are to provide a device of this class which is new, novel, practical and of utility; which is intended primarily for testing crude petroleum by separating therefrom and measuring its content of bottom sediment and water; which will be portable; which may be readily attached to and detached from any suitable support, such as an automobile runboard, or the like; which will operate upon electric current from a 6 volt storage battery, or may be adapted to operate upon other electric current as desired; which will be accurate, dependable, durable; which will be shielded from dust, dirt, insects and other extraneous matter; which will be safe in operation; which will permit the tests to be made in the proximity of the supply of petroleum which is to be tested; which will save much expense, time and labor, inasmuch as tests may be made in the field, rather than in a laboratory remote from the field; which will enable the operator to accept or to reject the petroleum from the tanks being tested, while on the tank premises, rather than after the delay of a trip to and from the usual testing laboratory; which will assist in establishing the market value of the crude petroleum or other substance, so tested; which will be efficient in accomplishing all the purposes for which it is intended.

In the the production of crude petroleum, frequently the petroleum as delivered from the well, is mixed with water and bottom sediment. In establishing a price for the petroleum the percentage of extraneous matter therein is an important consideration, as it is, also, in determining whether the petroleum may be transported satisfactorily in pipe lines. For these reasons it is customary for a test to be made of the crude oil, before same is accepted by the purchaser or by the carrier. In most instances because of the lack of satisfactory portable testing devices, it is necessary for samples of oil from various adjacent storage tanks, to be assembled and transported, by the employee entrusted with the matter, to a distant laboratory, where proper testing facilities are available. Only after his return to the field may the storage tanks be opened and the content delivered to the pipe line or other carrier. In the meantime it may even be necessary to stop production of the wells because of a lack of available storage facilities. It is true that some portable hand power, centrifugal machines are in use, but such have been found unsatisfactory, because of difficulty of operation under prevailing conditions, and because, being unshielded, of danger to the operator and their liability to collect at a high speed, blowing dirt, grit and flying insects.

Our shielded device, operated by current from the operator's automobile battery eliminates all of the objectionable features of the portable centrifugal machines of present use, and embodies new and useful features of its own, as well.

With these and other objects in view as will more fully appear, our invention consists in the construction, novel features, and combination of parts hereinafter more fully described, pointed out in the claims hereto appended, and illustrated in the accompanying one-sheet drawing, of which,

Figure 1 is a plan view of my device;

Figure 2 is a front elevational view; and

Figure 3 is a perspective view of the pivoted bottle container cage.

Like characters of reference designate like parts in all the figures.

It is understood that various changes in the form, proportion, size, shape, weight and other details of construction, within the scope of our invention may be resorted to without departing from the spirit or broad principle of our invention and without sacrificing any of the advantages thereof; and it is also understood that the drawings are to be interpreted as being illustrative and not restrictive.

A practical embodiment of the invention as illustrated in the drawings comprises:

An electric motor 1 adapted, in its most common form, to operate upon a 6 volt direct current from a battery not shown. Said motor 1 is provided with a flat base 2 which has

upon its central underside two parallel downstanding lugs 3, pivotally embracing the head of a hand clamping means 4.

Upstanding through the housing 5 of the motor 1 is the end portion of the vertical shaft 6 of said motor, and disposed thereupon at right angles thereto is the cross arm 7. Said cross arm 7 is provided centrally upon its upper surface with a boss 8 and both said boss 8 and arm 7 are perforated to fit upon the said shaft 6 and are secured rigidly thereto by the set screw 9. Said cross arm 7 is vertically bifurcated at each of its two end portions as shown at 10. The extending limbs 11 of the bifurcations 10 are each revolute as shown at 12, upon their free ends. It will be obvious that the arm 7 revolves horizontally with the vertical rotation of the said motor shaft 6, and further, that if desired two or more such cross arms 7 may be disposed upon the shaft 6, or that a single arm may be provided with four or more bifurcated end portions such as 11.

Pivotally disposed within the said revolute ends 12 of each pair of limbs 11 is a container cage 13, shown best in Fig. 3. Said cage 13 comprises an upper annular ring 14, provided with two extending oppositely disposed and alined pins 15 threadedly received by said link 14 and adapted to pivotally fit within the said revolute ends 12. A lower and somewhat smaller annular ring 16 is rigidly connected with said ring 14 by two oppositely positioned interextending link members 17. The perpendicular axes of rings 14 and 16 are alined.

Each of said cages 13 is adapted to securely but removably embrace and support a thin metal container tube 18. Said container 18 is cylindrical as to its upper portion; its lower portion gradually tapers to form a smaller closed rounded bottom 19, and both said cylindrical and tapered portions are adapted to fit within the said rings 14 and 16. It will be noted in Fig. 2 that said container is sustained by the bottom ring 16 in such a way that the container top portion rises above the top pivoted ring 14. Said container is adapted in size and shape to closely but removably hold a glass tube 20 of known make, having an outwardly flanged top 21.

The upper portion of the said motor 1 and the whole of the moving parts thereupon disposed are protected by a metal housing 22, attached by bolt or rivet means 23 or the like, to the vertically central portion of the said housing 5 of said motor 1, and said housing 22 is provided with a removable lid or top 24 having a handle 27. Said top is secured by a plurality of latch means shown as 25.

In operation, the device is positioned as desired, usually in or about an automobile and connected with the storage battery of same by means of suitable insulated wires 26. With the lid 24 removed, glass tubes 20, each filled with a quantity of the oil from the supply to be tested, together with a usual solvent, are placed within the said metal tube containers 18. The latter is then disposed within the cages 13 upon the bifurcated ends of the arms 7. The lid 24 is latched to the housing 22 and by means of a switch, not shown, electric current is permitted to flow to the motor 1. The rotation of the shaft 6 and the consequent revolution of the arm 7 and of the glass bottles 20, will in the usual and known manner be followed by the tilting of said bottles to the positions shown in the dotted lines in Figs. 1 and 2. In the usual and known manner the heavier portions of the liquid contained in said bottles will be separated from the lighter contents thereof and deposited in sequence as their various specific weights justify, at the outstanding or bottom ends of said glass container. For the reading of the results thus attained, said bottles are usually graduated in cubic centimeters.

Obviously, the invention is susceptible of embodiment in forms other than that which is illustrated in the accompanying drawings and described herein, and applicable for uses and purposes other than as detailed, and we therefore consider as our own all such modifications and adaptations and other uses of the form of the device other than as herein described as fairly fall within the scope of our invention.

Having thus described our invention what is claimed and desired to be secured by Letters Patent, is:

1. In a centrifugal machine, the combination with a motor having a vertical shaft, and a cross arm rigidly attached to the upper end of said shaft, of a cage as described for pivotally supporting test tubes between the bifurcated ends of said arm.

2. In a centrifugal machine, the combination with a motor having a vertical shaft, a cross-arm mounted perpendicularly on the upper end of said shaft, said cross arm pivotally supporting a cage at each of its ends, said cages each adapted to receive a test tube, of a metal housing rigidly attached to the periphery of said motor, said housing extending upward and outward past the sweep of said tubes when said shaft is rotated, and a removable lid for said housing.

3. In a centrifugal machine, the combination with a motor having a flat base, having a vertical shaft, and having a cross arm mounted perpendicularly on the upper end of said shaft, each end of said arm bifurcated to form parallel tines, of a cage pivotally and removably mounted on each end of said arm between said tines, said cage adapted to receive and support a glass tube and an enclosing metal cover, a metal housing rigidly attached to the periphery of said motor, said housing extending upward and outward

past the sweep of said arm cages and tubes when the device is in operation, and a removable cover or top for said housing.

4. A centrifugal machine, as described, having in combination, a motor adapted to be held in a vertical position, a cross arm disposed rigidly upon the upper end portion of the motor shaft, said cross arm having its free end portions bifurcated, a pair of cages each adapted to embrace the lower portion of a container for liquid, the top portion of each cage pivotally disposed within one of said bifurcated portions, and a metal housing having a removable lid, rigidly disposed around the periphery of said motor, said housing adapted to completely surround said arm and said containers when said machine is in operation.

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