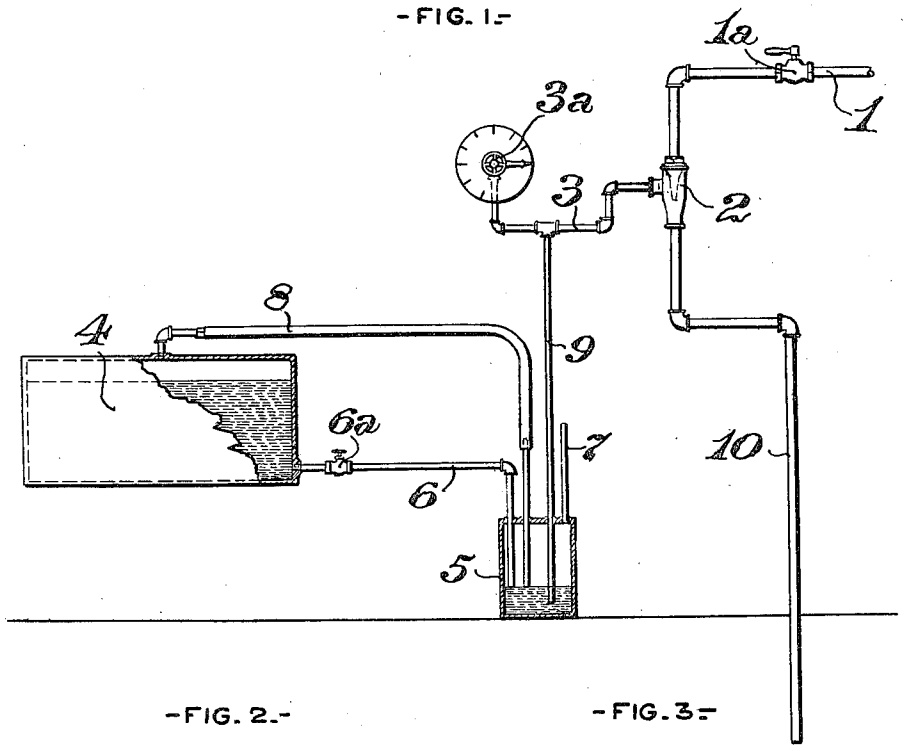
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S. A. BULLOCK ET AL

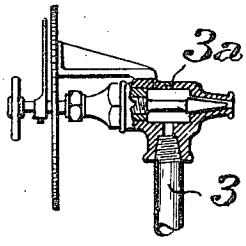
APPARATUS FOR FORMING EMULSIONS OF OIL AND WATER

Filed April 30, 1924

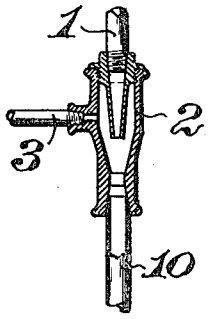
-FIG. 1.-



-FIG. 2.-



-FIG. 3.-



WITNESSES

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UNITED STATES PATENT OFFICE.

SAMUEL A. BULLOCK, OF PORT WASHINGTON, AND BERTEL T. PERRY, OF SCHENECTADY, NEW YORK.

APPARATUS FOR FORMING EMULSIONS OF OIL AND WATER.

Application filed April 30, 1924. Serial No. 710,096.

To all whom it may concern:

Be it known that we, SAMUEL A. BULLOCK and BERTEL T. PERRY, both citizens of the United States, and residents, respectively, of Port Washington, in the county of Nassau and State of New York, and of Schenectady, in the county of Schenectady and State of New York, have jointly invented a certain new and useful Improvement in Apparatus for Forming Emulsions of Oil and Water, of which improvement the following is a specification.

Our invention relates to the emulsification of suitable oil and water, and its object is to provide an effective and desirable apparatus for mixing oil, of various compositions, with water, in different desired proportions, to form water oil emulsions.

By "suitable" oil, as referred to herein, is meant any oil having the capacity of being formed into an emulsion with water, by simple agitation, as, for example, mineral oil compounded with alkali soap, or sulphonated oils combined with mineral oils. The emulsions produced are used principally in the lubrication of metal cutting machine tools, in their operation in cutting, reaming, sawing, or tapping, etc. Different proportions of oil and water are required for different kinds of work, and our invention is designed to avoid complicated procedure and structure, in the provision of accurate proportions of oil and water.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings: Figure 1 is a vertical central section, through an apparatus comprising means suitable for practicing our invention; Fig. 2, a view, partly in elevation, and partly in longitudinal central section, and on an enlarged scale, of the air supply valve of said apparatus; and, Fig. 3, a longitudinal central section, on an enlarged scale, of the ejector.

In the operation of the apparatus, the oil supply is drawn from a closed tank through a levelling trap, which controls the air pressure in said tank and maintains the level of oil therein substantially constant, to an ejector supplied with water under pressure.

The rate of flow of water to the ejector is under manual control and determines the amount of the emulsion delivered by the ejector. The pipe leading the oil to the ejector has a branch through which air can be admitted under valve control.

The apparatus is shown in the drawing comprises the following elements. A water pressure supply pipe, 1, controlled by a manually operable flow regulating valve, 1^a, leads from a reservoir, or other source of supply of water under ordinary distribution pressure, to a fluid pressure ejector, 2; and air is supplied to the ejector, through an air and oil supply pipe, 3, the supply of air being controlled by a manually operated regulating valve, 3^a.

An oil storage tank, 4, communicates with the supply pipe, 3, preferably, as shown, through the intermediation of a levelling trap, 5, the function of which is to ensure that the head of oil delivered to the ejector shall remain practically constant. Oil is supplied by gravity, to the levelling trap, through an oil feed pipe, 6, controlled by a manually operated valve, 6^a, said pipe leading from the oil storage tank, 4, near its bottom, into the levelling trap, 5, and terminating at a predetermined distance above the bottom thereof. An air inlet pipe, 7, leads into the levelling trap, 5, at its top, and an equalizing pipe, 8, leads from substantially the same level in the levelling trap as that of the bottom of the oil feed pipe, 6. An oil delivery pipe, 9, leads from the levelling trap, near the bottom thereof, to the air and oil supply pipe, 3, and an emulsion delivery pipe, 10, leads from the ejector, 2, to a desired point of discharge for the produced emulsion.

In the operation of an apparatus substantially as herein set forth, water under pressure, flows through the pipe, 1, to the ejector, 2. The action of the partial vacuum formed by the ejector, draws oil from the levelling trap, 5, through the pipes, 9 and 3, into the stream of water, and the flow of oil is regulated by the valve, 3^a, which admits air in sufficient quantity to effect the desired reduction of volume flow of oil into the practically constant volume flow of water. The water and oil, commingled under the water pressure, are delivered to a point of discharge, through the pipe, 10, in the form of a permanent emulsion.

When the oil is drawn from the levelling

trap to a level slightly below the end of the pipe, 8, air is thereby admitted, through said pipe, into the oil reservoir, 4, with the result of causing oil to flow, by gravity, from the oil reservoir into the levelling trap, through the pipe, 6. Oil can flow from the reservoir, only when air is admitted thereto and therefore a predetermined level of oil is maintained in the levelling trap. Air is admitted to the levelling trap, through the continuously open air inlet pipe, 7. The apparatus above described, which may be installed at inconsiderable expense, is adapted to form emulsions of various desired definite proportions. This result is effectually attained by the regulation of the flow of oil to the ejector, the quantity of oil in the emulsion being greater or less proportionately to the less or greater admission of air, respectively.

We claim as our invention and desire to secure by Letters Patent:

1. An apparatus for forming an emulsion of oil and water for lubricating purposes, comprising an ejector, means to supply water under pressure to the nozzle thereof, an oil reservoir, pipe connections between the lower part of said reservoir and said ejector and means to admit air into said connections in controllable quantity.

2. An apparatus for forming an emulsion of oil and water for lubricating purposes, comprising an ejector, means to supply water under pressure to the nozzle thereof, a closed oil reservoir, a leveling trap, a pipe leading from the bottom of said reservoir to a point near the bottom of said trap, an air pipe leading from the top of said reservoir to a point near the bottom of said trap, the latter having an inlet for air in its top, a pipe leading from the bottom of said trap to said ejector and having a branch for the admission of air to regulate the flow of oil.

3. An apparatus for forming an emulsion of oil and water for lubricating purposes, comprising an ejector, means to supply water under pressure to the nozzle thereof, a closed oil reservoir, a constant-level trap connected to said reservoir and to said ejector, and means to admit air in variable quantities into the connections between said trap and said ejector.

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