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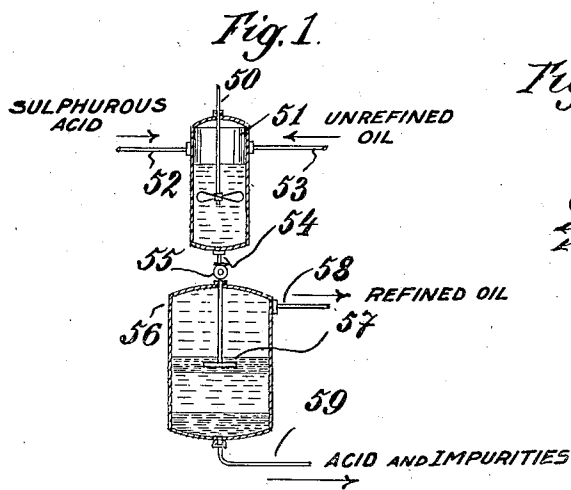
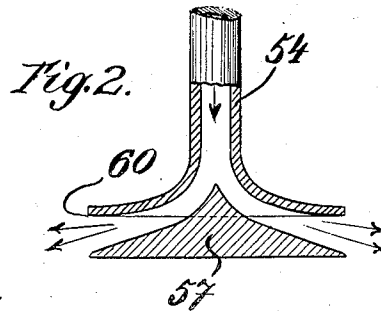
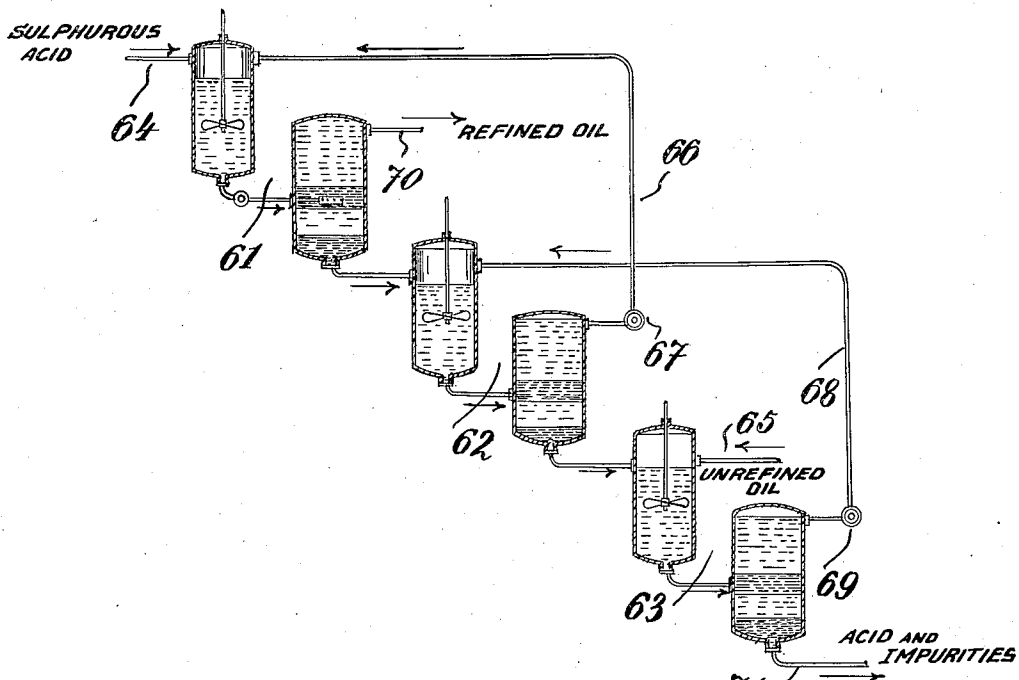
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ARRANGEMENT FOR REFINING HEAVY MINERAL OILS

Filed Sept. 13, 1924

2 Sheets-Sheet 1



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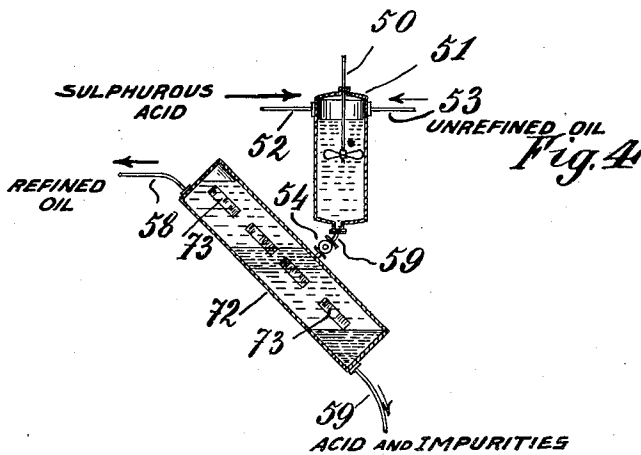
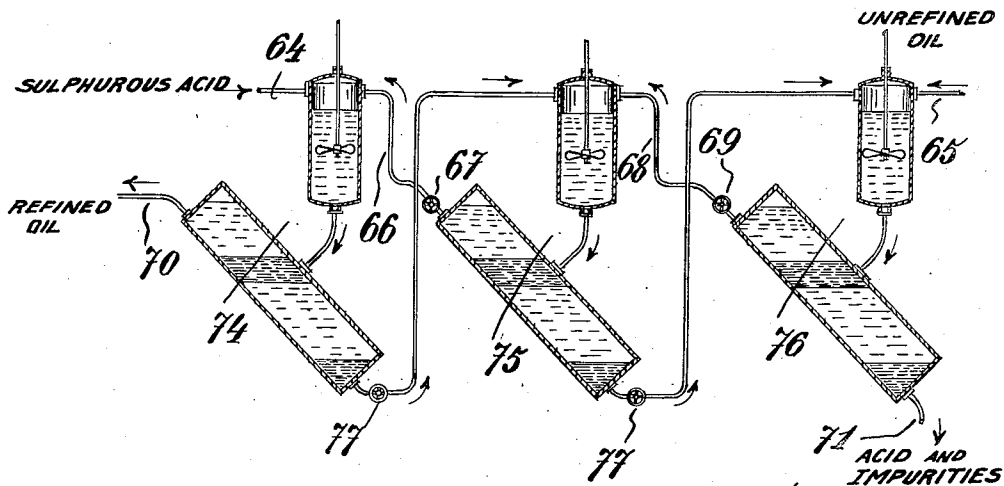


Fig. 5.



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UNITED STATES PATENT OFFICE.

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ARRANGEMENT FOR REFINING HEAVY MINERAL OILS.

Application filed September 13, 1924, Serial No. 737,542, and in Germany September 19, 1923.

This invention relates to arrangements for continuously refining heavy mineral oils by means of liquefied sulphurous acid.

For carrying out this process, the two fluids, viz, liquid sulphurous acid and the mineral oil to be refined, are brought together in counter-currents and intimately mixed, then the mixture is made to settle and the separated products, to wit, the refined oil and the extract, are continuously drawn off.

It has been found that the best results are obtained when a plurality of chambers are provided for mixing the fluids and afterwards separating them again, in combination with means for securing the flow of the fluids in both directions from one chamber to another and, at the same time, reducing the velocity of the fluids as they enter one chamber from another. The chambers can be divided in special compartments for mixing and for separating, and they can be arranged in the same vessel partitioned off from each other by suitable walls. The chambers can also be placed in separate vessels connected in such a manner as to allow the fluids to pass from one vessel to the other.

By way of example, some arrangements according to our invention are illustrated in the accompanying drawings.

Fig. 1 a special construction of the arrangement with separate vessels,

Fig. 2 a detail of the arrangement according to Fig. 1,

Fig. 3 a battery consisting of a plurality of arrangements as shown in Fig. 1,

Fig. 4 a modified construction of the arrangement according to Fig. 1, and

Fig. 5 a battery consisting of a plurality of arrangements shown in Fig. 4.

Fig. 1 shows a unit consisting of a mixing vessel 51 fitted with agitator 50 and of a settling tank 56 placed below. The heavy mineral oil to be refined is supplied into the vessel 51 at 53 and the liquid sulphurous acid at 52. The intimate mixture of mineral oil and sulphurous acid continually passes into the settling vessel 56 through the pipe 54, regulated by a valve 55. The pipe 54 extends nearly to the midst of the vessel 56 and is fitted with a distributing device 57 which discharges the mixture in a radial direction with the lowest possible speed. Thereby a continuous separation of the

mixed fluids is effected in such a manner that the refined oil can be drawn off at 58 and the extract at 59 in continuous working.

By way of example, a special construction of the distributing device 57 is illustrated on an enlarged scale in Fig. 2. As it is to be seen therefrom, the pipe 54 terminates in an annular slot 60 the cross section of which gradually enlarges so that the mixture can flow out horizontally in all directions with relatively low speed.

The arrangement as shown in Fig. 3, provides three units 61, 62, 63, connected in series and disposed in such a way that the mixture on the one hand and the extract on the other hand automatically flow from one vessel into the other whereas the refined oil is pumped over. The liquid sulphurous acid is admitted at 64 into the mixing vessel of the first unit 61, and the heavy mineral oil to be refined is supplied at 66 into the mixing vessel of the last unit 63. The pure sulphurous acid is mixed with the refined oil resulting in the second unit 62, and which is pumped through the pipe 66 into the mixing vessel of the first unit 61 by means of the pump 67. In the mixing chamber of the second unit 62 the extract from the first unit 61 is brought into contact with the refined oil resulting in the last unit 63, and which is conveyed by means of the pump 69 through the pipe 68, whereas the extract from the second unit 62 is brought into contact with the crude heavy mineral oil to be treated in the mixing vessel of the third unit 63. Consequently, a constant discharge of refined oil will take place from the settling tank of the first unit 61 at 70, and at 71 extract from the settling chamber of the last unit 63 will be continually discharged.

The construction shown in Fig. 4 essentially corresponds to the arrangement according to Fig. 1, except that the settling vessel 72 is inclined at an angle of about 45 degrees and, in consequence, the connecting pipe 54 enters laterally into the settling chamber 72 nearly in the midst thereof. The refined oil is discharged from the settling vessel at 58 and the extract at 59. The settling tanks can be provided with peep holes 73 for controlling the process at any time.

Fig. 5 shows an arrangement comprising three units 74, 75, 76, such as illustrated in Fig. 4, connected in series. In this case, the flowing of the liquids is quite the same as in

the arrangement according to Fig. 3, except that the extract too must be conveyed by means of pumps 77. The numerals referring to the pipes exactly correspond with those inserted in Fig. 3, the arrows indicate the direction of flow of the liquids.

An essential feature of the invention under consideration is to provide means for realizing an intimate mixing of the oil with the liquid sulphurous acid and a satisfactory separation of the constituents of the mixture by settling, and for realizing the latter task, it is highly important to make best use of the refining action of the sulphurous acid which is accomplished by braking off or reducing the velocity of the acid falling in the oil to be refined.

What we claim is:—

1. Apparatus for continuously refining heavy mineral oils by means of liquefied sulphurous acid, comprising in combination means for intimately mixing the said oils and acid, a settling chamber in which refined oil and acid carrying impurities which result from the mixing may be separated by gravity, conduits connecting the mixing means with the settling chamber, and means for re-

tarding the velocity of the fluids as they enter the settling chamber.

2. Apparatus for continuously refining heavy mineral oils by means of liquefied sulphurous acid, which comprises in combination a mixing chamber provided with an agitator, a settling chamber below the mixing chamber and a conduit leading from the bottom of the mixing chamber to approximately the middle of the settling chamber, said conduit having a gradually enlarging discharge orifice for reducing the velocity of the flow of the fluid from the mixing chamber into the settling chamber.

3. Apparatus as defined in claim 2, and in which the discharge orifice is presented outwardly and radially with respect to the axis of the said conduit.

The foregoing specification signed at Zurich this 25 day of August 1924.

DR. LAZAR EDELEANU.

And at Berlin this 28th day of August, 1924.

KARL PFEIFFER.
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