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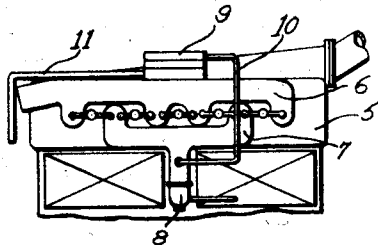
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F. E. CARTER

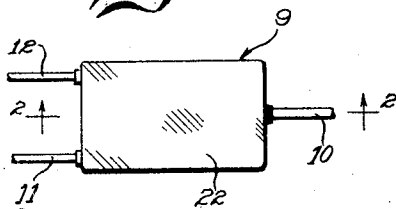
OIL RECTIFIER

Filed June 11, 1927

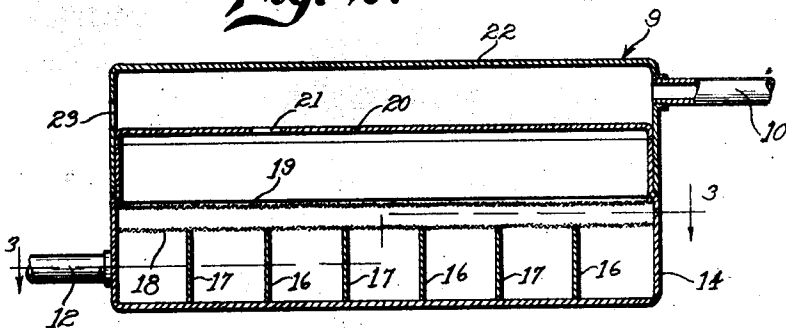
*Fig. 1.*



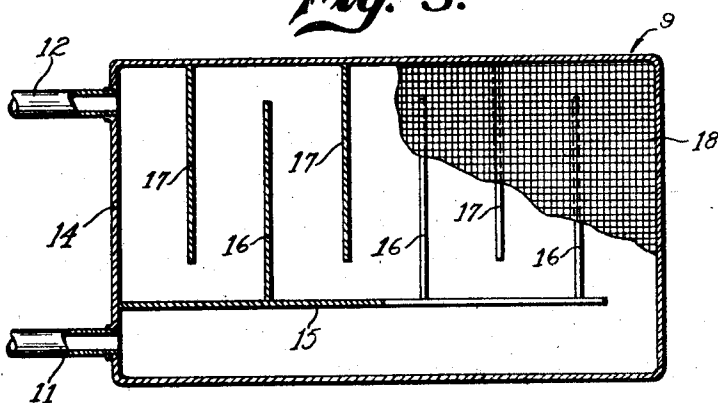
*Fig. 4.*



*Fig. 2.*



*Fig. 3.*



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# UNITED STATES PATENT OFFICE.

FRANK EDWARD CARTER, OF BRAWLEY, CALIFORNIA.

## OIL RECTIFIER.

Application filed June 11, 1927. Serial No. 198,190.

This invention relates to an oil rectifier forming an element of a lubrication system for internal combustion engines wherein there is a circulation of oil subjected to dilution by a more volatile liquid. The present invention relates more especially to automobile engines. The effects of dilution of the crank case oil of engines operated by carbureted liquid fuel, such as gasoline are well known. The crank case lubricant is less volatile than the fuel liquid and therefore the latter can be separated from the lubricant by the application of heat so as to attain the temperature of vaporization of the diluent an opportunity being afforded for the latter to pass off from the circulatory system or to be withdrawn. The heat of the engine especially that of the exhaust gases will serve for vaporization. It is an object of this invention to provide a simple compact and efficient rectifier which has no moving parts and requires no adjustments or manipulation.

These objects together with other objects and corresponding accomplishments are obtained by means of the embodiment of my invention illustrated in the accompanying drawing in which:

Fig. 1 is an elevation showing an internal combustion engine such as is used in an automobile with my improved oil rectifier mounted thereon; Fig. 2 is a vertical section on an enlarged scale of the rectifier; Fig. 3 is a section as seen on the broken line 3—3 of Fig. 2; and Fig. 4 is a plan view on a reduced scale of the rectifier.

Referring with more particularity to the drawing, especially Fig. 1, a gasoline engine is indicated by 5, and is provided with the usual crank case for lubricating oil supplied to the pistons and cylinder walls. An exhaust manifold is marked 6 and the intake manifold 7. A carbureter is indicated by 8. Mounted upon the exhaust manifold is the rectifier 9 having tubing 10 leading from its upper chamber to the intake manifold. Intake tubing for lubricating oil is indicated by 11 and discharge tubing 12 serves for the removal of the treated lubricant oil from the rectifier. The rectifier is preferably connected on the intake side of the usual oil pump although this position is not essential. It is merely necessary that the rectifier be interposed in the circulation system.

The rectifier proper comprises a receptacle 14 having a wall 15 extending lengthwise

of the receptacle and ending short of the wall opposite to the tubing connections for the inlet and outlet of oil. Baffle plates 16 extend from the wall 15 and alternate with walls 17 extending from the opposite wall of the receptacle. The receptacle is thus constructed so that a tortuous passage is provided for the lubricant which enters through the tubing and thence in an undulating path passes to the opposite end and out through the discharge tubing 12. The passage of the oil around the baffles causes stirring and agitation of the same. The upper face of the passage in the receptacle is open to an upper air space of chamber in the receptacle and extending across the open face is a pair of screens 18 and 19. Thus, a liquid chamber is provided separated from the air chamber by screens. These screens are of a mesh such that the vapor may pass freely therethrough, but the liquid which may splash thereagainst is arrested from passage therethrough. Although two are shown any suitable number may be used. The bottom of the receptacle is made of a shape to conform to the exhaust manifold surface with which it contacts so that heat from the exhaust manifold is freely conducted to the receptacle bottom and thence to the oil. The result is that the lubricant from the crank case passing through the receptacle is heated so that vaporization of the diluent is effected. The vaporized diluent passes through the screens 18 and 19 and into a vented air chamber formed by a dome 20. The dome serves as a further precaution against the passage of lubricant from the receptacle. There is an opening 21 for the passage of the vapor outwardly.

A cover 22 may be disposed over the dome providing a space above the latter into which the vapor may pass and from which it may be withdrawn through tubing 10 connected thereto. Tubing 10 may be connected to the intake manifold of the engine thereby returning the inflammable vapor to the engine for use as fuel. In some instances it may be found advisable to permit the vapors to escape into the atmosphere. In such a case, the cover 22 is omitted and also the tubing 10. The dome 20 then serves to protect the rectifier from the ingress of dust and other foreign matter.

It will be noted that I have provided a rectifier which is compact, has an exposure for lubricant for a relatively long distance in the travel to provide for the emission of vapor.

The baffles serve to keep the heated lubricant in agitation so as to free the vapors generated, while the screens prevent splashing with the consequent waste of oil and where the vapors are led to the intake manifold preventing the passage of the liquid lubricant to the latter. The air chamber between cover 22 and dome 20 is open to the atmosphere at the end opposite to tube 10 by way of a slot 23 extending thereacross. This prevents the suction from tube 10 drawing oil up through hole 21. The latter is only for the purpose of permitting the vaporized gasoline to pass into the chamber.

15 What I claim is:

1. In combination with an internal combustion engine having a lubricant circulation means in which the lubricant is subject to dilution, a receptacle for lubricant interposed in said means for the passage of lubricant through said receptacle and being disposed to have heat transferred thereto from said engine; said receptacle having a vented air chamber at its upper portion to expose the upper surface of the lubricant passing through said receptacle to the air in said chamber, and a screen disposed between the lubricant and air chamber to permit the passage therethrough of vapor and arrest the passage therethrough of liquid lubricant.

2. In combination with an internal combustion engine having a lubricant circulation means in which the lubricant is subject to dilution, a receptacle for lubricant interposed in said means for the passage of lubricant through said receptacle and being disposed to have heat transferred thereto from said engine; said receptacle being shallow and having a vented air chamber at its upper portion to expose the upper surface of the lubricant passing through said receptacle to the air in said chamber, and a screen disposed between the lubricant and air chamber to permit the passage therethrough of vapor and arrest the passage of liquid lubricant.

3. In combination with an internal combustion engine having an exhaust conduit, a lubricant circulation means in which the lubricant is subject to dilution, a receptacle for lubricant interposed in said means for the passage of lubricant through said receptacle and being disposed at the exhaust conduit to have heat transferred therethrough from the exhaust gases; said receptacle having a vented air chamber at its upper portion to expose the upper surface of the lubricant passing through said receptacle to the air in said chamber, and a screen disposed between the lubricant and air chamber to permit the passage therethrough of liquid lubricant.

4. In combination with an internal combustion engine having an exhaust conduit, a lubricant circulation means in which the lubricant is subject to dilution, a receptacle

for lubricant interposed in said means for the passage of lubricant through said receptacle and being disposed at said exhaust conduit to have heat transferred thereto from the exhaust gases; said receptacle being shallow and having a vented air chamber at its upper portion to expose the upper surface of the lubricant passing through said receptacle to the air in said chamber, and a screen disposed between the lubricant and air chamber to permit the passage therethrough of vapors and arrest the passage therethrough of liquid lubricant.

5. In combination with an internal combustion engine having a lubricant circulation means in which the lubricant is subject to dilution, a receptacle for lubricant interposed in said means for the passage of lubricant through said receptacle and being disposed to have heat transferred thereto from said engine; said receptacle having a vented air chamber at its upper portion and a liquid chamber at its lower portion having a tortuous passage defined therein, and a screen disposed between said chambers to permit the passage therethrough of vapors and arrest the passage therethrough of liquid lubricant.

6. In combination with an internal combustion engine having a lubricant circulation means in which the lubricant is subject to dilution, a receptacle for lubricant interposed in said means for the passage of lubricant through said receptacle and being disposed to have heat transferred thereto from said engine; said receptacle being shallow and having a vented air chamber at its upper portion and a liquid chamber at its lower portion in communication so as to expose the lubricant passing through said liquid chamber to the air in said air chamber, there being walls in said liquid chamber to define a tortuous passage and cause agitation of the passing lubricant, and a screen disposed between said chambers to permit the passage therethrough of vapor and arrest the passage therethrough of liquid lubricant.

7. In combination with an internal combustion engine having an exhaust conduit, a lubricant circulation means in which the lubricant is subject to dilution, a receptacle for lubricant interposed in said means for the passage of lubricant through said receptacle and being disposed at said exhaust conduit to have heat transferred thereto from the exhaust gases; said receptacle having a vented air chamber at its upper portion and a liquid chamber at its lower portion in communication so as to expose the lubricant passing through said liquid chamber to the air in said air chamber, said liquid chamber having a tortuous passage for the lubricant, and a screen disposed between said chambers to permit the passage therethrough of vapor and arrest the passage therethrough of liquid lubricant.

8. In combination with an internal combustion engine having an exhaust conduit, a lubricant circulation means in which the lubricant is subject to dilution, a receptacle  
5 for lubricant interposed in said means for the passage of lubricant through said receptacle and being disposed at said exhaust conduit to have heat transferred thereto from the exhaust gases; said receptacle being shallow and having a vented air chamber at its  
10 upper portion and a liquid chamber at its lower portion in communication so as to expose the lubricant passing through said liquid chamber to the air in said air chamber, there being walls in said liquid chamber to  
15 define a tortuous passage and cause agitation of the passing lubricant, and a screen disposed between said chambers to permit the passage therethrough of vapors and arrest the passage  
20 therethrough of liquid lubricant.

9. In combination with an internal combustion engine having a lubricant circulation means in which the lubricant is subject to dilution, a receptacle for lubricant interposed  
25 in said means for the passage of lubricant through said receptacle and being disposed to have heat transferred therethrough from said engine; said receptacle being shallow and having a vented air chamber at its upper portion and a liquid chamber at its lower  
30 portion in communication so as to expose the lubricant passing through said liquid chamber to the air in said air chamber, walls in

said liquid chamber to provide a tortuous passage for the passing lubricant and to cause  
35 agitation of the same, a screen disposed between said chamber, a receiving chamber above said screen for said vapor and conduits for the withdrawal of vapor from said receiving chamber.  
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10. In combination with an internal combustion engine having an exhaust conduit, a lubricant circulation means in which the lubricant is subject to dilution, a receptacle  
45 for lubricant interposed in said means for the passage of lubricant through said receptacle and being disposed at said exhaust conduit to have heat transferred thereto from the exhaust gases; said receptacle being shallow and having a vented air chamber at its  
50 upper portion and a liquid chamber at its lower portion in communication so as to expose the lubricant passing through said liquid chamber to the air in said air chamber, baffles in said liquid chamber to provide a tortuous  
55 passage for the passing lubricant and cause agitation of the same, a screen disposed between said chamber, a receiving chamber above said screen for said vapors and conduits for the withdrawal of the vapors from  
60 said receiving chamber.

In witness that I claim the foregoing I have hereunto subscribed my name this 27th day of May, 1927.

FRANK EDWARD CARTER.