Dec. 2, 1930. K. H. HINRICHS 1,783,472

OIL BASE INSULATING PAN FOR INTERNAL COMBUSTION ENGINES

Filed Nov. 19, 1928

Fig. 1

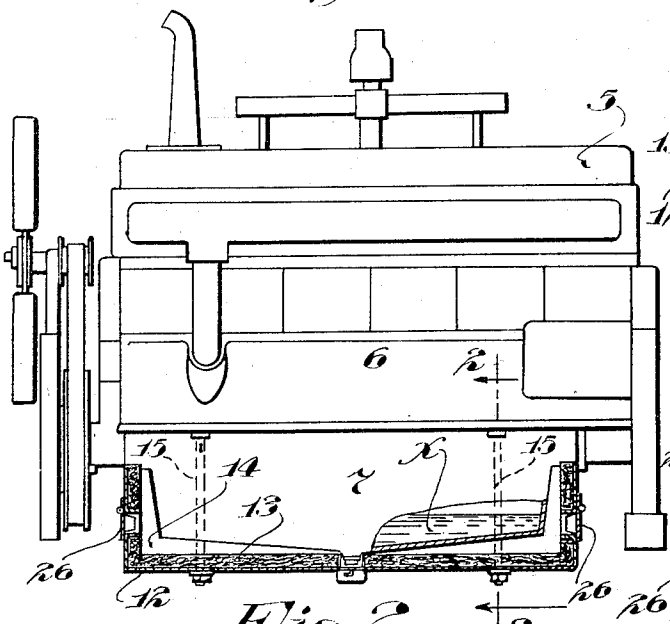


Fig. 4

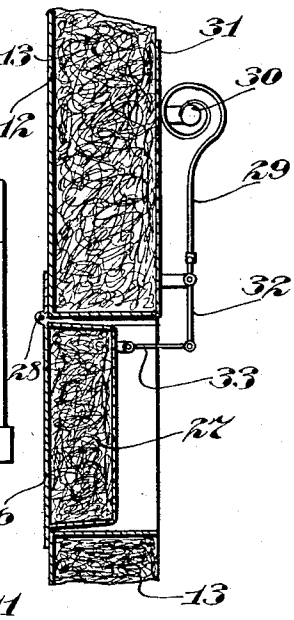


Fig. 2

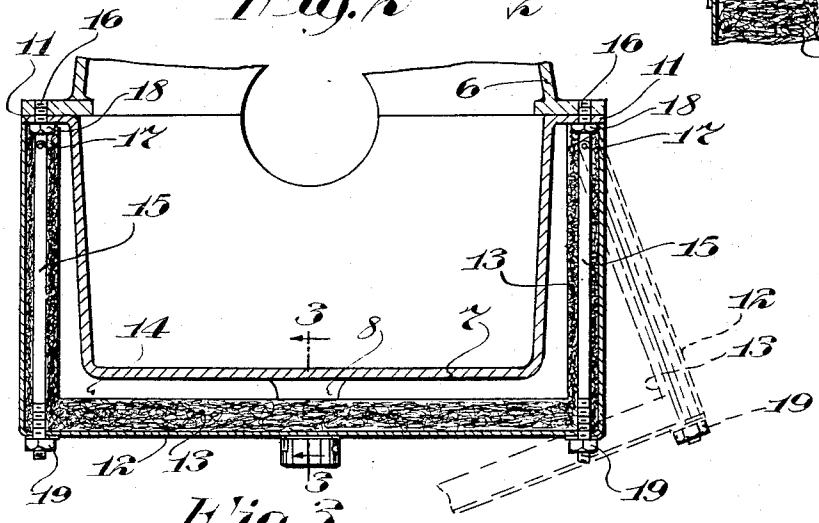
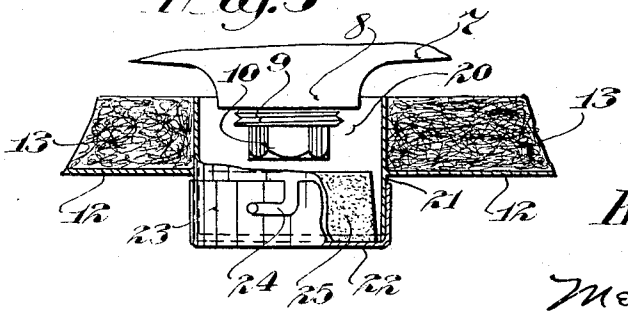


Fig. 3



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UNITED STATES PATENT OFFICE

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OIL-BASE INSULATING PAN FOR INTERNAL-COMBUSTION ENGINES

Application filed November 19, 1928. Serial No. 320,385.

My invention relates to an oil base insulating pan for internal combustion engines of the same general type as disclosed and broadly claimed in the copending application of Walter W. Schwarting, filed February 17, 1928, under Serial Number 255,069.

The aims of my invention are to improve the method of attaching the pan in respect to the engine oil base, to facilitate the opening of the pan to afford access to the oil base and the closing of said pan to form a tight joint between the pan and oil base and for causing a circulation of air through the pan when the temperature is such as to render the insulating pan unnecessary for keeping the lubricant in the oil base at the desired consistency.

To the above end, generally stated, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a view principally in side elevation of an internal combustion engine having the invention applied thereto and illustrated in central longitudinal section;

Fig. 2 is a view principally in transverse vertical section taken on the line 2—2 of Fig. 1, on an enlarged scale;

Fig. 3 is a fragmentary detail view with some parts sectioned on the line 3—3 of Fig. 2, on an enlarged scale; and

Fig. 4 is a fragmentary view principally in section showing a modification in which the door for the air intake passageway is thermally controlled.

The internal combustion engine illustrated is indicated as an entirety by the numeral 5 with the exception of its crank case 6, oil base 7 having in its bottom a drain hole 8 surrounded by a depending boss and normally closed by a screw plug 9 on the lower end of which is a hexagon head 10 for the application of a wrench for turning the screw plug 9 into or out of the drain hole 8. The letter X indicates the lubricating oil in the oil base 7. On the upper marginal edge of the oil base 7 is an outstanding horizontal flange 11 detachably secured by screws, not shown, to the crank case 6.

Referring now in detail to the insulating pan 12, the same is lined on its sides and bottom with an insulating material 13. This pan 12 surrounds the sides and bottom of the oil base 7 and the same, together with the insulating material 13, is spaced from said oil base to form a dead air chamber 14 which, together with the insulation 13 forms a highly efficient heat retainer.

The insulating pan 12 at each side is held suspended from the crank case 6 by a pair of upright hanger rods 15. These hanger rods 15 are held suspended from the crank case 6 by screw studs 16 to which the upper ends of said rods are hinged at 17 for swinging movement transversely of the engine 5. The screw studs 16 are anchored to the crank case 6 by removing certain of the screws heretofore referred to which attach the oil base 8 to the crank case 7 and screwing said studs into the tapped holes from which the screws have been removed. Nuts 18 are applied to the screw studs 16 and serve as heads which engage the flange 11 and hold the same pressed against the crank case 6 to form a tight joint therewith.

The hanger rods 15 extend through holes formed in the insulation 13 that extend from the top to the bottom thereof and through aligned holes in the bottom of the pan 12. Nuts 19 are applied to the screw-threaded lower ends of the hanger rods 15 and support the pan 12 therefrom. By tightening the nuts 19 on the hanger rods 15 the upper marginal edge portion of the pan 12 is pressed against the crank case 6 as well as the pliable insulation 13 to form a tight joint between the pan 12 and the flange 11 of the oil base 7.

Formed in the bottom of the pan 12 and the insulation 13 is a large aperture 20 into which the boss surrounding the drain hole 8 and the head 10 of the plug 9 extend, see Fig. 3. Formed with the pan 12 and surrounding the aperture 20 is a depending annular sleeve 21 to which is removably applied a cap 22 having a capping flange 23 telescoped onto the sleeve 21 and detachably secured thereto by bayonet joints 24. The cap 22 is provided

with a piece of insulation 25 which substantially closes the sleeve 21. By removing the cap 22 access may be had to the screw plug 9 to move the same and drain the old lubricant through the hole 8. In place of the bayonet joints 24 the cap 22 may be detachably secured to the sleeve 21 by screw threads or other suitable means.

In place of taking the pan 12 off in the summer time when it is not necessary to insulate the oil base 7, an air intake opening and an air discharge opening are formed one in each end of the pan 12 and provided each with a door 26. This door 26 is hollow and filled with an insulating material 27. The doors 26 are hinged at their upper edges, as indicated at 28, and arranged to be closed by gravity. Each door 26, although only one thereof is shown, is independently controlled by a thermostat comprising a thermally actuated member 29 one end of which is anchored to a post 30 on a plate 31 on the inside of the pan 12 and the other end thereof is attached to the short end of an intermediately fulcrumed lever 32. The long end of the lever 32 is attached to the door 26 by a link 33. The thermostats are adapted to open the door 26 when the temperature in the chamber 14 reaches a predetermined degree and control the closing thereof when said temperature drops below said predetermined degree.

When the doors 26 are open a forced draft will be produced through the pan 12 under the movement of the vehicle on which the engine 5 is mounted and thereby keep the oil in the oil base 7 from getting too hot. To drain the old lubricant X it is only necessary to remove the cap 22 and thereafter the plug 9. In case the plug 9 is so located that access thereto is not possible or at least not practical, access may be had thereto or to any part of the oil base 7 by removing the nuts 19 on one side of the pan 12 and by loosening the nuts 19 on the other side of said pan to permit the respective side of the pan 12 to drop sufficiently to bring its upper edge substantially to the hinge joints 17 so as to be clear of the studs 16 and allow the pan 12 to swing open, as shown by broken lines in Fig. 2. The pan 12 may be swung open on either side of the oil base 7 by removing the nuts 19 on the opposite side of said pan.

If desired, the thermostats may be dispensed with and the doors 26 manually opened and held open or closed by any suitable means.

What I claim is:

1. The combination with an internal combustion engine having an oil base, of a closed pan surrounding the sides and bottom of the oil base but spaced therefrom to afford a dead air chamber therebetween, said pan having air intake and discharge passageways and displaceable closures for the passageways.

2. The structure defined in claim 1 in further combination with thermally actuated means for opening and closing the closures.

3. The combination with an internal combustion engine having an oil base, of a closed pan surrounding the sides and bottom of the oil base but spaced therefrom to afford a dead air chamber therebetween, hinged doors for the passageways, and means for opening and closing the doors.

4. The combination with an internal combustion engine having an oil base, of a closed pan surrounding the sides and bottom of the oil base but spaced therefrom to afford a dead air chamber therebetween, hinged doors for the passageways, and automatic means for opening and closing the doors.

5. The combination with an internal combustion engine having an oil base, of a closed pan surrounding the sides and bottom of the oil base but spaced therefrom to afford a dead air chamber therebetween, doors for the passageways arranged to close under the action of gravity, and thermally actuated means for opening the doors and for controlling the closing thereof.

6. The combination with an internal combustion engine having an oil base, of a closed pan surrounding the sides and bottom of the oil base, said pan being hinged to the oil base for downward and outward swinging movement from each side thereof.

7. The combination with an internal combustion engine having an oil base, of a closed pan surrounding the sides and bottom of the oil base, and hinge-acting members suspending the pan from the oil base at each side thereof, said members being releasable from either side of the pan to permit said pan to swing downwardly and outwardly from the other side of the oil base.

8. The combination with an internal combustion engine having an oil base, of a closed pan surrounding the sides and bottom of the oil base, upright hanger rods suspending the pan from the oil base, and screw studs anchored to the oil base and to which studs the upper ends of said rods are hinged, said rods having adjustable nuts on their lower ends from which the pan is supported.

9. The combination with an internal combustion engine having an oil base, of a closed pan surrounding the sides and bottom of the oil base, an insulating lining in the pan, upright hanger rods suspending the pan from the oil base, said rods being removably mounted in passageways in the lining, and screw studs anchored to the oil base and to which studs the upper ends of the rods are hinged, said rods having nuts on their lower ends from which the pan is supported.

10. The combination with an internal combustion engine having a crank case, an oil

base and studs detachably securing the oil base to the crank case, of upright hanger rods having their upper ends hinged to the studs, adjustable nuts on the lower ends of the hanger rods, and a pan surrounding the sides and bottom of the oil base and supported on the nuts of the hanger rods.

11. The combination with an internal combustion engine having an oil base provided with a drain hole, and a screw plug normally closing the same, of a pan surrounding the sides and bottom of the oil base and having an aperture into which the screw plug extends, and a displaceable closure for the aperture, said pan being hinged to the oil base for downward and outward swinging movement, said aperture being arranged to permit the pan to swing clear of the screw stud during its opening and closing movements.

12. The combination with an internal combustion engine having a crank case and an oil base and screw studs securing the oil base to the crank case, of a pan surrounding the sides and bottom of the oil base, and upright hanger rods having their upper ends hinged to the screw rods and provided with adjustable nuts from which the pan is supported and held with its upper edge pressed against the oil base to form a tight joint therewith.

In testimony whereof I affix my signature.

KARL H. HINRICHS.