

UNITED STATES PATENT OFFICE

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INTERNAL COMBUSTION ENGINE

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2 Claims. (Cl. 184—1)

This invention relates to retarding or inhibiting bearing corrosion and sludge forming tendencies normally occurring in motor oils employed in the crank case of an internal combustion engine, and to improving the oil from the standpoint of prevention of lacquer or varnish formation and ring sticking, and stability against oxidation during use therein.

It has been found that the formation of sludge and gummy substances in lubricating oils employed in internal combustion engines, is at least partly due to oxidation of the oils, which oxidation is promoted by the catalytic effect of the iron in the walls of the engine cylinders. Investigations also indicate that the salts of iron, copper, zinc and aluminum, when present in small percentages in motor oil, promote corrosion of the new alloy bearings. In a co-pending application of Charles C. Towne, Serial No. 180,556, filed April 21, 1938, it is pointed out that stannous naphthenate on the other hand is unique among the heavy metal organic salts of this character, in that it inhibits bearing corrosion in addition to possessing the other advantages of reducing ring sticking, and retarding oxidation and sludge formation.

In accordance with the present invention, the interior of the crank case and other parts of an internal combustion engine which are exposed to the lubricating oil are tin-plated, so that crank case oil is prevented from contacting with iron or other metals which would catalyze the oxidation of the oil. In this manner, the objectionable catalytic effect of iron or aluminum which might otherwise be exposed to the crank case oil is avoided.

It is known to use tin-plated pistons for the purpose of providing for quick running-in and prevention of scoring of both pistons and cylinders. A similar suggestion has been made with respect to tin-plating bearing sleeves but other iron parts are thereby left exposed to contact by the oil so that catalytic oxidation of the oil takes place.

Preferably the entire interior wall of the crank case of an internal combustion engine as well as the undersides and outer sides of the pistons and other parts which come in contact with the oil, are plated with tin, and in this manner all contact between the lubricating oil and iron or alu-

minum surfaces is prevented. In addition to plating with tin, other processes may be used for coating the metal parts to prevent contact between the lubricating oil and iron or other metals which would catalyze the oxidation of the oil.

While the invention has been particularly described in connection with the tin-plating of a crank case and other parts of an internal combustion engine, it is to be understood that it is of value in other applications and in fact wherever lubricating oil comes in contact with surfaces which are substantially free from wearing engagement with other metal surfaces, and in which the oil is normally subject to deterioration by oxidation and sludge formation. For example, non-bearing surfaces of a turbine oil system or a bearing oil well may be plated with tin in order to inhibit oxidation and sludge formation of the oil employed in the turbine system or in the bearing well. The surfaces which are thus plated are those which normally contact with the lubricating oil employed, and which are free from bearing or wear engagement with other metallic parts, so that a long life of the coating is insured.

Obviously many modifications and variations of the invention as hereinbefore set forth may be made without departing from the spirit and scope thereof, and therefore only such limitations should be imposed as are indicated in the appended claims.

I claim:

1. In connection with an internal combustion engine having surfaces adapted to be contacted by a lubricating oil, and in which the oil is normally subject to deterioration by oxidation and sludge formation, the method of retarding such deterioration of the oil which comprises forming at least that portion of the surface of the engine which is adapted to be contacted by the oil of a durable coating of tin of sufficient thickness to last over an extended period of the order of the normal life of the engine.

2. As an article of manufacture, a crank case for an internal combustion engine having on its interior surface a permanent coating of tin to retard deterioration by oxidation of lubricating oil normally in contact with said surface.

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