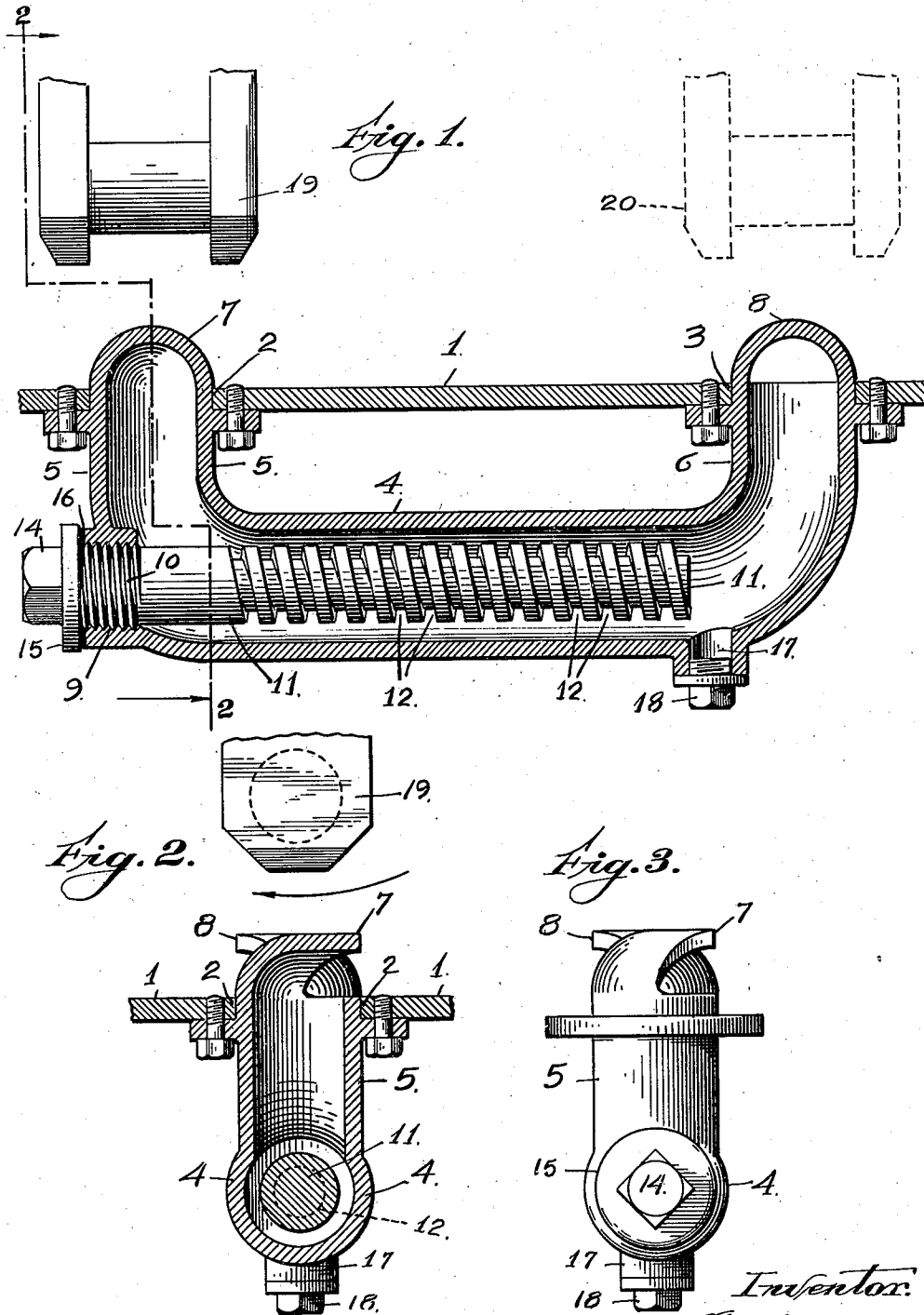


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 MEANS FOR ARRESTING PARTICLES OF METAL IN LUBRICATING OIL.
 APPLICATION FILED JULY 29, 1918.

1,335,955.

Patented Apr. 6, 1920.



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MEANS FOR ARRESTING PARTICLES OF METAL IN LUBRICATING-OIL.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FRANK J. COX, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Means for Arresting Particles of Metal in Lubricating-Oil, of which the following is a specification.

My invention relates to improved means for arresting and retaining particles of metals from lubricating oils within the crank case of an internal combustion motor wherein a grooved magnet operates in conjunction with means for circulating the oil around and in the vicinity of said magnet; and the objects of my invention are—

First, to provide an improved means for arresting and retaining particles of metal from lubricating oil used in the crank case of an internal combustion motor;

Second, to provide an improved device of the character described having grooves or riffls to retain particles of arrested metal against the velocity of circulating oil;

Third, to provide an improved device of the class described wherein the metal arresting means may be easily detached or removed for cleansing purposes; and

Fourth, to provide a device of the class described having means for assisting in maintaining a circulation of oil past the arresting means and preferably in one direction only.

I accomplish these and other objects by means of the preferred form of the device disclosed in the drawings forming a part of the present specification wherein like characters of reference are used to designate similar parts throughout the said specification and drawings, and in which—

Figure 1 is a broken longitudinal sectional view of my device applied to the bottom of the crank case of an internal combustion motor;

Fig. 2 is a transverse sectional view taken on line 2—2 of Fig. 1 in the direction indicated; and

Fig. 3 is an end elevation of the device removed from a crank casing and disclosing the oppositely faced hoods on opposite ends.

Referring to the drawings the numeral 1 is used to designate the bottom of a crank case of an internal combustion motor and provided with apertures 2 and 3. A by-pass 4, having its main portion arranged

substantially parallel with the bottom or side, as the case may be, of the crank case 1 and provided with lateral extensions 5 and 6 extending through the apertures 2 and 3 respectively to connect with the interior of said crank case 1.

The lateral extensions 5 and 6 are provided with oppositely faced hoods 7 and 8 respectively, the purpose of which will hereinafter be more fully set forth.

A threaded opening 9 within one end of the main portion of the by-pass 4 is engaged by the threaded portion 10 of a permanent magnet 11 having grooves or riffls 12 preferably formed by means of a square thread as disclosed in Fig. 1 of the drawings.

The outer end of the magnet 11 is provided with a nut 14 to facilitate removal of said magnet 11, and a flange 15 which engages a suitable gasket 16 to prevent leakage of oil from the by-pass 4.

A drain opening 17, closed by a suitable threaded plug 18 is provided to drain the by-pass 4 when required.

The apertures 2 and 3 of the crank case 1 are located directly under adjacent cranks 19 and 20 and the hoods 7 and 8 are faced in opposite directions so as to facilitate the ingress and egress of the oil through said hoods and thereby tend to maintain a circulation of the oil through the by-pass 4 in one direction only when said oil is disturbed by the rotation of the cranks 19 and 20.

Referring to Fig. 2 of the drawings it will be noted that the rotation of the crank 19 will tend to move the oil into the hood 7 while the rotation of the crank 20 will tend to move the oil past the hood 8 in a direction which will cause a partial suction in the vicinity of the said hood 8 and thereby tend to draw the oil out from said hood 8.

By means of this circulation of oil through the by-pass 4 small particles of metal that have been worn from the moving part will be brought into the immediate vicinity of and attracted by the permanent magnet 11 and will be generally arrested and drawn into the riffls or grooves 12 of said magnet 11 thereby further securing said particle against removal from said grooves 12 by the movement of the oil past the said magnet.

As the particles of metal are thus arrested and withheld from circulation from the oil

said metal particles will thereby be prevented from coming into contact with moving parts which would tend to score said parts, especially the cylinder and piston surfaces, thereby reducing compression and the general efficiency of the motor.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is—

10 1. The combination with the crank case of an internal combustion motor of a by-pass connected thereto to receive lubricating oil from said crank case; and magnetic means within the by-pass for attracting and re-
15 taining the particles of metal from the oil flowing through said by-pass.

2. The combination with the crank case of an internal combustion motor of a by-pass connected thereto to receive lubricating oil from said crank case; and magnetic means within the by-pass for attracting and retain-
20 ing particles of metal from the oil flowing through said by-pass; and means for maintaining a circulation of oil through the by-
25 pass.

3. The combination with the crank case of an internal combustion motor of a by-pass connected thereto to receive lubricating oil from said crank case; magnetic means with-
30 in the by-pass for attracting and retaining particles of metal from the oil flowing through said by-pass; and oppositely faced hoods formed integral with opposite ends of the by-pass to assist in maintaining a cir-
35 culation of oil through said by-pass.

4. The combination with the crank case of an internal combustion motor of a by-pass connected thereto to receive lubricating oil from said crank case; and detachable mag-
40 netic means for attracting and retaining particles of metal from the oil passing through said by-pass.

5. The combination with the crank case of an internal combustion motor of a by-pass connected thereto to receive lubricating oil from said crank case; and detachable mag-
45 netic means for attracting and retaining particles of metal from the oil passing

through said by-pass; and means for main-
taining a circulation of oil through the said
50 by-pass.

6. The combination with the crank case of an internal combustion motor of a by-pass connected thereto to receive oil from said crank case; means for maintaining a circu-
55 lation of oil through said by-pass; and a grooved magnet detachably mounted within the by-pass to attract and retain particles of metal from said oil.

7. The combination with the crank case of an internal combustion motor of a by-pass connected thereto to receive oil from said crank case; means for maintaining a circu-
60 lation of oil through said by-pass; a grooved magnet detachably mounted within the by-
65 pass to attract and retain particles of metal from said oil; and means for draining the by-pass.

8. The combination with the crank case of an internal combustion motor of a by-pass connected thereto to receive oil from said crank case; oppositely faced hoods formed
70 integral with opposite ends of the by-pass to assist in maintaining a circulation of oil through said by-pass when said oil is agi-
75 tated by cranks on a crank shaft within said case; and a grooved, detachable magnet mounted within the by-pass to attract and retain particles of metal within the oil pass-
80 ing therethrough.

9. The combination with the crank case of an internal combustion motor of a by-pass connected thereto to receive oil from said crank case; oppositely faced hoods formed
85 integral with opposite ends of the by-pass to assist in maintaining a circulation of oil through said by-pass when said oil is agi-
90 tated by cranks on a crank shaft within said case; a grooved, detachable magnet mounted within the by-pass to attract and retain particles of metal within the oil passing there-
through; and means for draining the by-
pass.

In witness whereof I hereunto set my signature.

FRANK J. COX.