Feb. 7, 1928. 1,658,774

A. TAUB

COMBINED OIL GAUGE AND BREATHER CAP

Filed Aug. 15, 1924

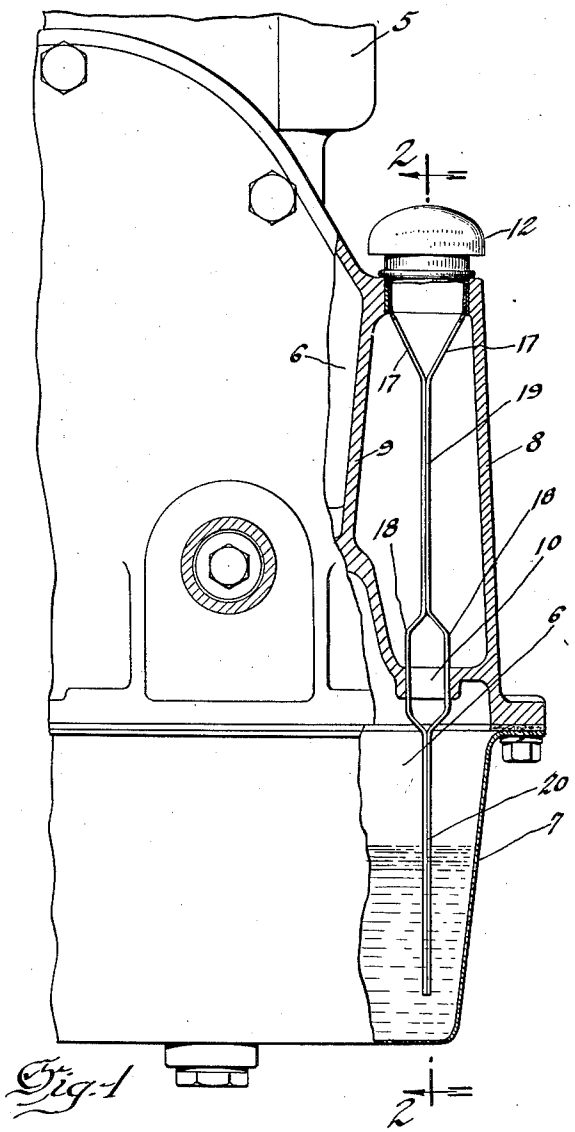



Fig. 1

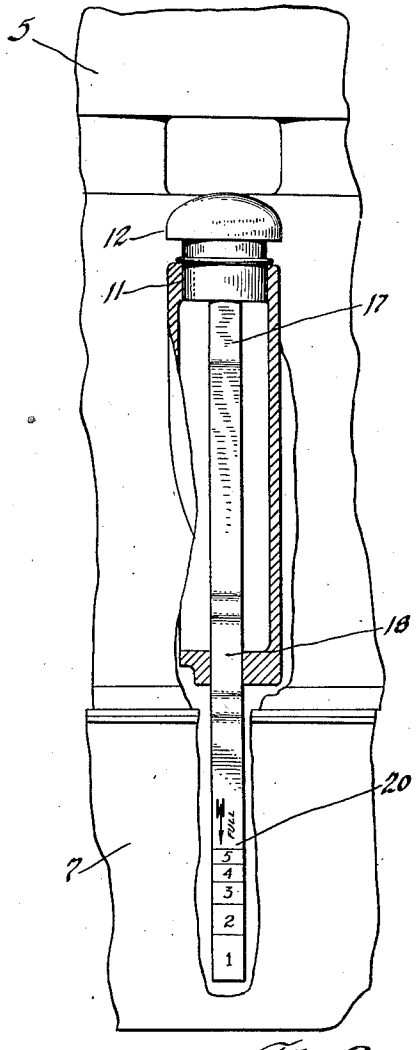



Fig. 2

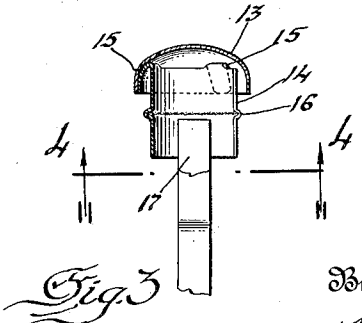



Fig. 3

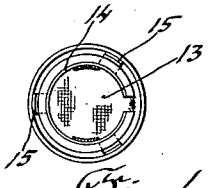



Fig. 4

Inventor
Alex Taub
By his Attorneys
Blackmore, Spencer & Fluhr.

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# UNITED STATES PATENT OFFICE.

ALEX TAUB, OF DETROIT, MICHIGAN, ASSIGNOR TO GENERAL MOTORS CORPORATION, OF DETROIT, MICHIGAN, A CORPORATION OF DELAWARE.

## COMBINED OIL GAUGE AND BREATHER CAP.

Application filed August 15, 1924. Serial No. 732,244.

My invention relates to internal combustion engines designed for propelling motor driven vehicles, and particularly to a combined oil gauge and breather opening closure or cap made as a single unitary structure; and designed to be used with such engines to indicate the depth of oil in the oil pan or crank case thereof, and to also provide for a free inflow and outflow of air into and from the crank case and the space beneath the pistons of the engine.

In high speed internal combustion engines of the type referred to the space within the engine block and beneath the pistons, and inside the crank case and above the oil pan of the engine, is ordinarily put into communication with the external atmosphere through an opening located well above the oil pan or crank case space wherein the lubricating oil is contained; in order to permit the escape of such gas as may find its way past the pistons and into the space beneath them to the external atmosphere to thereby prevent the accumulation of pressure inside the cylinder block, and in order to permit air to flow freely into and out from said space as the volume thereof varies with the positions of the pistons. Such engines are also commonly provided with a readily accessible and easily removable gauge in the form of a rod, the lower end of which is submerged in the oil of the crank case or in an oil pan formed separate from the crank case for indicating the level of oil within the cylinder block.

The opening through which air surges into and out from the crank case should be and is commonly provided with a cap for covering the same and preventing the entrance of dust into the inside of the cylinder block to as great an extent as possible; and my invention comprehends the making of these two elements, the cap for closing the opening through which the air surges (and which is commonly referred to as a breather opening and cap), and the oil gauge as one unitary structure, so that the breather cap may be grasped by the hand and removed bringing the oil gauge along with it.

The drawing accompanying and forming a part of this specification illustrates the preferred embodiment of my invention; although it will be appreciated that the same may take various other forms, so long as such forms come within the scope of the concluding claims wherein the distinguishing features wherein my invention consists are particularly pointed out.

Referring now to the drawing:

Figure 1 is a fragmentary view showing parts of an engine equipped with my invention, in elevation for the most part, with certain parts in section upon a vertical plane transverse to the crank shaft of the engine;

Figure 2 is a similar view showing a section upon a vertical plane indicated by the line 2, 2, Figure 1, parallel with the crank shaft of the engine and looking toward the left, Figure 1;

Figure 3 is a fragmentary detail view showing the breather cap and a portion of the upper end of the oil gauge rod, this view being upon a section indicated by the line 3, 3, Figure 4;

Figure 4 is a view also showing the breather cap upon a horizontal plane indicated by the line 4, 4, Figure 3, looking up.

Referring now to the drawing, the reference numeral 5 designates a portion of the cylinder block of an internal combustion engine, contemplated as of the multiple cylinder type, and 6 designates the space inside the same and below the pistons of the engine, the lower portion of which space forms the crank chamber of the engine. The lower end of the cylinder block and of the crank case portion thereof is shown herein as closed by separate and distinct oil pan 7 secured to the open under side of the cylinder block; although in some engines the oil containing space corresponding with the oil pan 7 is made integral with the lower end of the cylinder block.

The cylinder block is provided with a hollow protuberance 8 partitioned off from the interior space 6 by a suitably arranged partition 9 disposed in a general vertical position; and the interior of this protuberance or extension is placed in communication with the interior of the cylinder block through an opening 10 in the lower portion of the partition or wall 9. The interior of this member is also placed in communication with the atmosphere through its open upper end 11; from which it follows that excess of pressure should it accummulate within the cylinder block will be relieved through the opening 10 and the open upper end of the extension 8, and also that air may flow freely into and out from the space 6 through said

opening and passage due to the action of the engine pistons.

The breather opening 11 is closed by a breather cap designated in its entirety by the reference numeral 12. This breather cap is shown by itself in Figures 3 and 4, and is made up of or comprises a dome shaped cover 13, and a dependent cylindrical guide 14; the latter having a series of lugs 15 formed integrally therewith and turned downward, and suitably fastened to the inner surface of the cover in any suitable way, as clearly shown in Figure 3. This cylindrical portion is also preferably provided with a suitable stop shown as in the form of a peripherally extending flange 16 formed by upsetting the material of the wall, to thereby provide an outwardly extending bead or fold in the metallic wall of the guide.

The oil gauge proper of my invention is shown as made up of two long strips of metal arranged alongside one another and suitably shaped to provide diverging arms 17 at the upper end thereof, the extremities of which are fastened to the cylindrical portion 14 of the breather cap; and an intermediate guide portion formed by parallel portions 18, 18 of said strips, which guide portion fits closely within the opening 10 in the partition 9. Between the guide portion and the arms the strips which form the oil gauge are brought into contact with one another and fastened together by rivets, spot welding or otherwise, as indicated at 19; and below the guide portion the said strips are likewise brought together and similarly secured in contact with one another to provide the oil scale 20 of the oil gauge. This lower or scale portion is suitably graduated as shown in Figure 2 to indicate definitely or conventionally the amount of oil in the oil pan or crank case.

In view of the premises it will be appreciated that the oil gauge comprising the parts 17, 18 and 20 is supported from the breather cap 12, and is removable therewith to ascertain the amount of oil within the crank case of the engine or to replenish the supply therein by fresh oil poured through the open upper end 11 of the protuberance 8. The guide portion 18 of the gauge rod is guided and steadied, as will be appreciated, by its engagement with the opening 10 in the partition 9; but does not interrupt the flow of air through said opening as the engagement of the guide portion at the opening is between comparatively narrow side portions of the strips which form the gauge rod and the guide itself is in the form of a frame open at its sides and above and below the opening 10.

Having thus described and explained my invention, I claim and desire to secure by Letters Patent:

1. In an internal combustion engine and in combination with the crank case thereof, a hollow protuberance formed integrally with said crank case and the interior of which is in communication therewith through a lower opening, and in communication with the external atmosphere through an opening at the upper end of said protuberance; a breather cap fitting within said upper opening; and an oil gauge carried by said breather cap and extending through said protuberance and into the oil space of the engine; said oil gauge extending through the opening in the lower portion of said protuberance and the same being in engagement with the side walls of said opening whereby said opening forms a guide for an intermediate portion of said oil gauge.

2. In an internal combustion engine and in combination with the crank case thereof, a partition whereby a portion of the interior of said crank case is partitioned off from the remainder thereof to thereby provide an internal chamber the upper end of which is in communication with the atmosphere through a suitable opening, said partition having an opening in its lower portion leading into the space inside the engine cylinder; a breather cap for closing said first mentioned opening; an oil gauge carried by said breather cap and comprising two strips of metal the upper ends of which are connected therewith, the intermediate portions of which lie within and engage the walls of the opening at the lower portion of said partition, and the lower portions of which extend into the oil containing space; portions of said strips between said upper ends and said guide portion, and below said guide portion, being in contact with one another.

In testimony whereof I affix my signature.

ALEX TAUB.