No. 781,066. PATENTED JAN. 31, 1905.

E. R. HEWITT.

ENGINE CRANK SHAFT.

APPLICATION FILED MAR. 23, 1904.

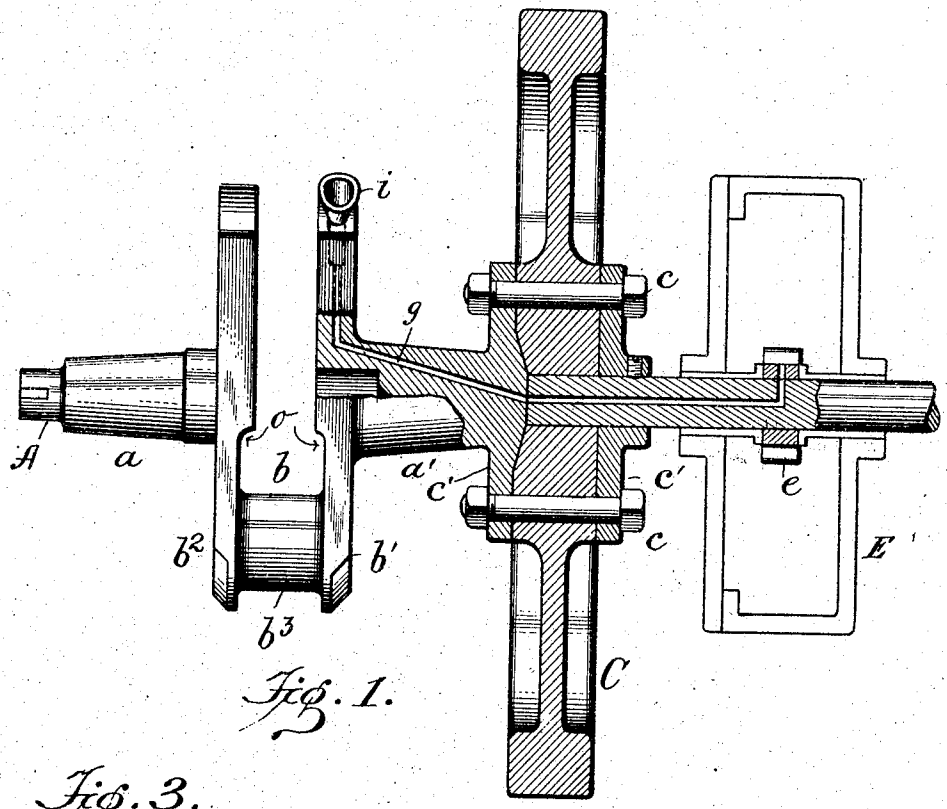
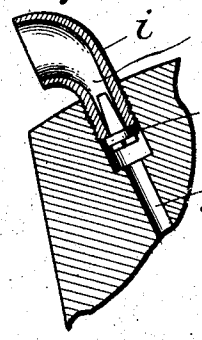


Fig. 1.

Fig. 3.



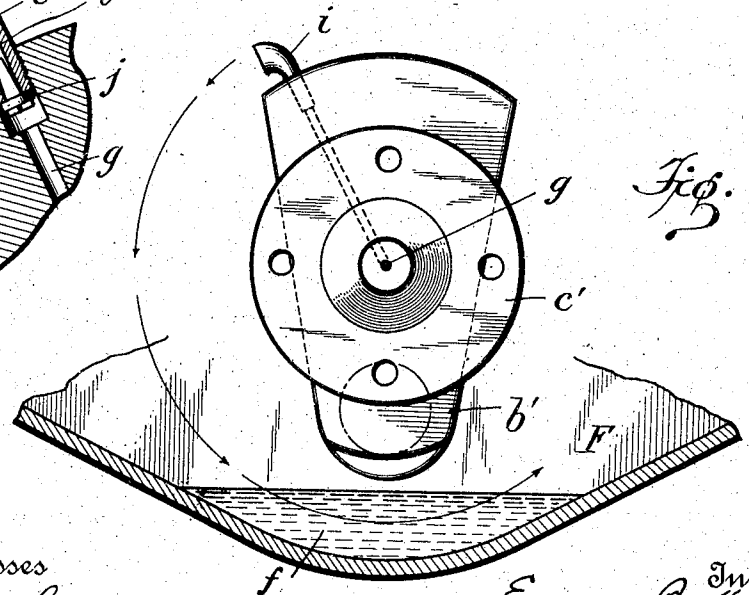


Fig. 2.

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No. 781,066. Patented January 31, 1905.

UNITED STATES PATENT OFFICE.

EDWARD R. HEWITT, OF NEW YORK, N. Y.

ENGINE CRANK-SHAFT.

SPECIFICATION forming part of Letters Patent No. 781,066, dated January 31, 1905.

Application filed March 23, 1904. Serial No. 199,660.

To all whom it may concern:

Be it known that I, EDWARD R. HEWITT, a citizen of the United States, residing at the city of New York, in the borough of Manhattan and State of New York, have invented certain new and useful Improvements in Engine Crank-Shafts, of which the following is a full, clear, and exact description.

This invention relates to certain improvements in engine crank-shafts, the invention having to do with the lubrication of parts of a power apparatus located remote from the engine-crank by utilizing the motions of the crank to convey oil from the crank-pit to said remote parts.

My invention consists, essentially, in applying a scoop to the crank, which is adapted to dip into the body of oil in the crank-pit at each rotation of the crank and take up a certain amount of the oil, which is afterward conveyed by suitable internal passages through and along the crank-shaft to a distant point, where it is delivered to certain parts to be lubricated.

The invention will now be described in detail, with reference to the accompanying drawings, wherein—

Figure 1 is a view, partially in section and partially in elevation, of an engine crank-shaft comprising the features of my invention. Fig. 2 is an end elevation of the crank viewed from the right-hand side of Fig. 1 with the fly-wheel removed and also showing a portion of the crank-pit. Fig. 3 is a detail.

A is the crank-shaft, having between its bearings a and a' the crank b, consisting of two radial arms or plates b' and b^2, connected across one end by a crank-pin b^3 and at the opposite ends each being enlarged into a fan shape to furnish a counterbalancing-weight.

C is a fly-wheel on the crank-shaft, shown in this instance as being bolted thereto by bolts c, which pass through disks c', respectively, on two parts of the shaft and through the hub of the wheel. The shaft continues beyond the fly-wheel into a gear-box E, the details of which are not shown. The box, however, may be understood to contain any of the usual or preferred systems of gearing, beginning or ending with a pinion e on the shaft. Such gear-trains require considerable oil; and one of the objects of this invention is to continuously conduct oil in small quantities to the interior of this box while the engine is in motion. The crank, as usual, rotates in a box or pit F, a portion only of which is shown in Fig. 2 and in the bottom of which is a well usually containing a quantity of oil to be caught up by the crank and thrown to various locations in the crank-box and into the engine-cylinder communicating therewith. The body of oil is indicated by f. From the peripheral extremity of one of the crank-arms a passage g leads first radially through the crank-arm and thence longitudinally through the shaft to a point within the zone of the pinion e and thence radially through the shaft and pinion to the surface of the latter. At the point where this passage enters the end of the crank-arm I enlarge it somewhat and screw therein a scoop-shaped mouthpiece i, having a contracted throat i' and terminating interiorly in a valve-seat, against which a valve j is adapted to seat outwardly to close the passage.

The operation of this feature of the invention is as follows: The mouth of the scoop i being placed in the direction of rotation of the crank, at each rotation of the latter the scoop is forcibly driven through the body of oil f, the motion of the crank and the converging shape of the throat of the scoop causing sufficient pressure behind the valve j to throw it from its seat and permit a quantity of the oil to enter the passage g. This operation being repeated at each rotation of the crank, the passage is constantly charged with oil, which seeks an outlet at the face of the pinion e, from which point it spreads to all the wearing-surfaces of the gear-box. The object of the valve j is to prevent the oil which has once entered the passage from being thrown out of the radial lead of the passage by the centrifugal force due to the rotation of the crank. Thus while the crank is turning through the arc above the surface of the body of oil f the valve j is held closed; but as soon as the scoop strikes the oil the pressure in the former opens the valve and admits a supply to the passage.

By this very simple device I provide a way

for constantly lubricating the gear-box of an engine without the use of a specially-constructed pump or other apparatus, which, besides its cost and complications, requires attention.

The method of lubricating herein described may of course be applied in various other ways. It is not, for instance, necessary that the scoop be connected with a crank, as a special radial arm may be attached to the shaft for the purpose, and a special body of oil independent of that in the crank-pit may be provided for the scoop. It is also obvious that the oil may be conveyed in the manner described to any other piece of mechanism requiring lubrication besides the gear-box mentioned.

Having described my invention, I claim—

1. The combination of a shaft having a crank thereon and a passage in said crank leading to the parts to be lubricated, the said passage having an enlarged mouth at its outer end, a crank-pit containing free lubricating material, and an inwardly-opening valve in said passage adapted to be thrown outwardly and closed by centrifugal force.

2. The combination of a shaft having a crank thereon and a passage in said crank leading to the parts to be lubricated, a flaring mouthpiece fitting within the outer end of said passage and facing the direction of movement of said crank, a crank-pit containing free lubricating material, and an inwardly-opening valve in said passage adapted to be thrown outwardly by centrifugal force and to seat against the inner end of said mouthpiece.

In witness whereof I subscribe my signature in presence of two witnesses.

EDWARD R. HEWITT.

Witnesses:

FRANK S. OBER,

WALDO M. CHAPIN.