

Feb. 26, 1935.

T. A. HAMMOND ET AL

1,992,371

INTERNAL COMBUSTION ENGINE

Original Filed Dec. 8, 1921 2 Sheets-Sheet 1

Fig. 1.

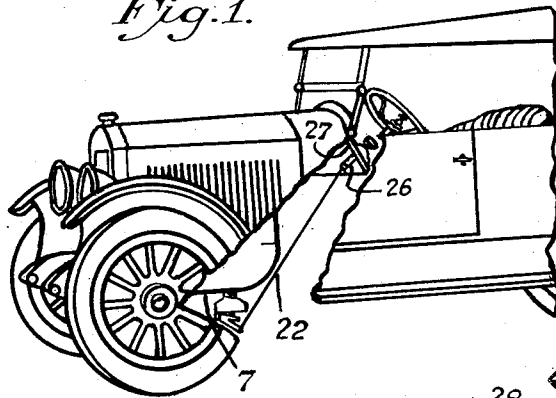


Fig. 2.

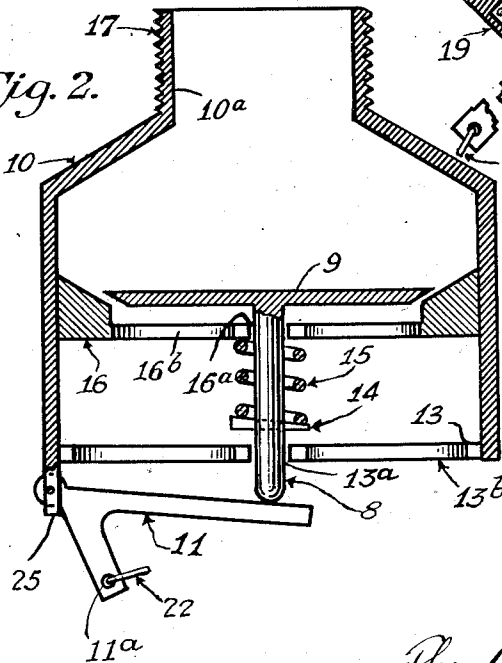


Fig. 4.

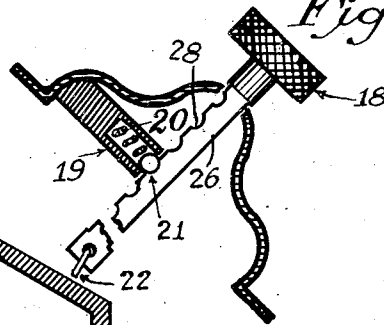
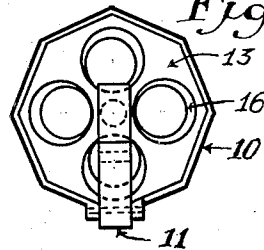


Fig. 3.



Inventor  
Theodor A. Hammond and  
Pierre Frank Soumek  
By their Attorneys  
P. Frank Soumek

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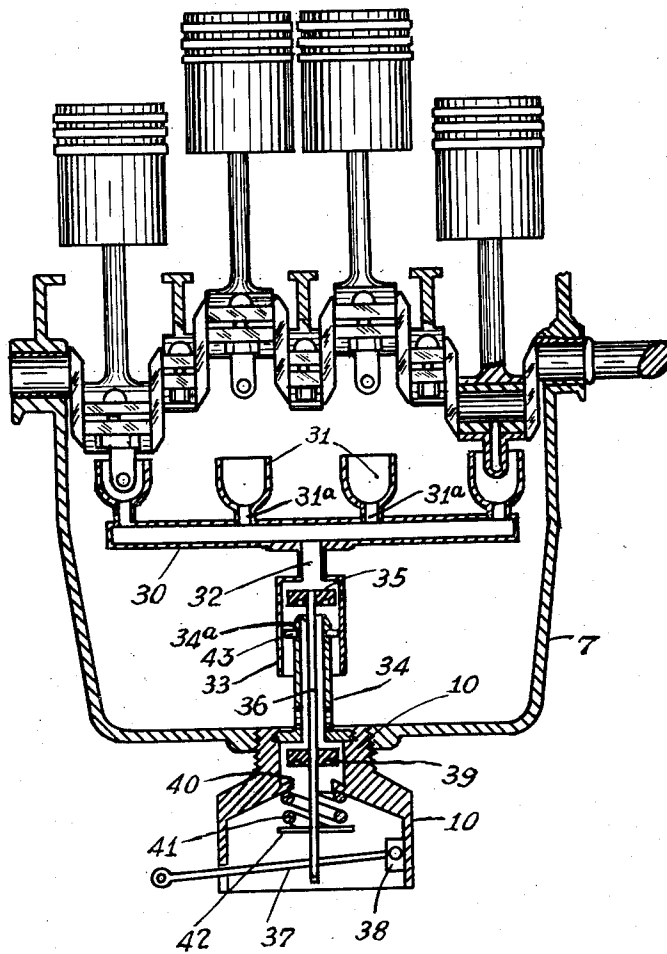
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*Fig. 5.*



Inventor  
*Theodore A. Hammond and*  
*Pierre Frank French*  
By their Attorney  
*P. Frank French*

# UNITED STATES PATENT OFFICE

1,992,371

## INTERNAL COMBUSTION ENGINE

Theodore A. Hammond, Montclair, N. J., and  
Pierre Frank Sonnek, Woodhaven, N. Y.

Application December 8, 1921, Serial No. 520,917  
Renewed November 4, 1930

3 Claims. (Cl. 184—1.5)

The present invention relates to improvements in internal combustion engines and is more especially directed to means for facilitating the cleaning of the crank case of the engine so that fresh or new lubricating oil injected in the crank case will not be diluted by the residue of the oil which has been removed.

As is well known, the crank case of an internal combustion engine is designed to contain a predetermined quantity of lubricating oil. This oil in time loses its viscosity and should be removed from the crank case and fresh oil substituted therefor. To drain or remove the oil from the crank-case it is customary to remove a screw plug which is usually located at the lowermost point. To gain access to this plug one must crawl beneath the engine and as it is withdrawn from its seat a quantity of oil generally rushes through the opening and drops onto the operator lying beneath the engine. Obviously, therefore, the periodical cleansing of the crank-case is neglected, the engine operator usually deferring the work as long as possible. This neglect of the engine with its consequent damage to the operating parts may be directly attributed to the difficulty encountered in draining the crank-case. Therefore, in order to insure proper care of the engine, the draining of the crank-case must be facilitated so that the work of renewing the oil may be accomplished with less labor and with a greater degree of cleanliness than is now possible.

It is the primary object of the present invention to provide a simple and economical means for draining the crank case of an internal combustion engine which may be operated or controlled while the person doing the work is in an upright or standing position, thereby enabling one to drain the crank-case and replenish the oil without crawling beneath the engine and without the use of tools.

A further object of our invention is to provide a means having the aforesaid advantages and characteristics which may be readily installed in motors or engines under construction or may be substituted for the usual screw plug in engines which are in operation.

Another advantage of our invention resides in the cleaning or draining of the splash-pan in the crank-case from which the oil is splashed during the reciprocation of the pistons. The desirability of this cleansing of the splash-pan is obvious. Nevertheless, with present crank-case structures it cannot be accomplished without the removal of the lower section thereof.

Other objects and advantages of our invention will become apparent as the description proceeds, and we would have it understood that we reserve unto ourselves all rights to the full range of equivalents, both in structure and uses, to which we may be entitled under our invention in its broadest aspect.

For the purposes of the present disclosure, we have elected to illustrate and describe certain preferred embodiments of our invention. Obviously, our invention may take other forms to meet various requirements of manufacture and use without departing from the spirit and scope thereof as defined by the appended claims.

We shall now proceed to describe our invention with reference to the accompanying drawings, in which

Figure 1 is a fragmentary perspective of a motor-vehicle embodying our invention.

Figure 2 is a sectional elevation of the detachable valve member or housing.

Figure 3 is a bottom plan view of the structure shown in Figure 2.

Figure 4 is a view, partly in section, of the means for actuating the valve from the dashboard or cowl.

Figure 5 is a modification of the structure shown in Figure 2, illustrating one method of simultaneously draining the oil-sump and the splash-pan by a single operation.

Referring now to the drawings in detail, in which like reference numerals are employed to designate similar parts throughout the several views, 10 indicates the valve housing which may be a casting, stamping, or the like, and is preferably of the configuration shown. The upper end of the housing is contracted or reduced as at 10a and externally threaded at 17. The threaded portion 17 is adapted to enter and mesh with the threads of the usual drain plug seat provided in the base or sump of the crank-case 7. Obviously, for installation in existing engines, the threads and diameter of the reduced portion 10a correspond to those of the drain plug for which the valve-member or housing 10 is to be substituted.

Located within the housing 10, as shown in Figure 2, is a valve seat 16 provided with a central opening 16a to form a bearing for the stem 8 of the valve 9. The lower end of the stem 8, it will be observed, passes through the guide plate 13 which, similarly to the valve seat 16, is provided with a central opening 13a and a plurality of radially disposed openings 13b through which the oil flowing through the openings 16b in the seat 16

may pass. Adjacent to the lower end of the stem 8, we provide a cross-pin 14 (or washer) to engage one end of the coil-spring 15 carried by said stem. The other end of this spring abuts against the underside of the valve seat 16. The spring 15 is an expansion spring and normally functions to maintain the valve 9 in engagement with the seat 16.

Pivotaly mounted on an extension or bracket 25 on the housing 10, we provide a bell-crank lever 11, the longer arm of which is adapted to bear against the end of the valve stem 8. The shorter arm of said lever is apertured at 11a to receive a cable, wire, or the like, 22 by means of which the said lever is connected to the rod 26 mounted on the dash-board or cowl 27. The rod 26 may be notched or in the form of a rack, as shown at 28, these notches being adapted to engage a pin 21 slidably mounted within the slotted end of the bracket 19 fixed to the interior of the housing 29. The outer end of the rod 26 is provided with a preferably knurled handle or finger-piece 18, whereby it may be reciprocated in its bearing formed by the cooperating portion of the housing.

From the foregoing, it will be obvious that the movement of the rod 26 in an upward direction will rock the lever 11 on its fulcrum and effect the lifting of the valve 9 from its seat against the tension of the spring 15. The seating of the pin 21 in one of the notches 28 under the tension of the spring 20 will serve to hold the rod 26 in its adjusted position, so that the valve 9 will remain unseated until the rod 26 is actuated to permit the valve to return to its seat through the expansion of the spring 15.

In the structure shown in Figure 5, we have illustrated our invention as applied to an engine so as to drain the splash-pan 30 which is provided with the customary recesses or troughs 31. In this modification of our invention, the troughs 31 communicate with the interior of the splash-pan as shown at 31a, the pan having a preferably centrally located outlet at 32 which opens into the valve chamber 33.

Similarly to the structure shown in Figures 1 to 4, inclusive, the housing 10 is threaded into the drain opening of the sump of the crank-case 7, the upper end of the housing having an extension or nipple 34 projecting into the valve chamber 33. The upper end of the nipple 34 forms a seat for the valve 35 mounted on the end of the stem or rod 36, the other extremity of said stem or rod being bifurcated or otherwise formed to receive the lever 37 fulcrumed at 38 on the wall of the housing 10. Located between the valve 35 and the lower end of the rod 36 is a second valve 39 which has a seat 40 provided on the interior of the housing 10. The valves 35 and 39 are held on their respective seats by the tension of the spring 41 which is supported between the underside of the seat 40 and the pin or washer 42 carried by the rod 36. To facilitate assembly of our device, we provide a flexible joint between the nipple 34 and the valve chamber 33. This may take the form of a ring of packing material 43 which is held within a groove or recess 34a in the nipple 34, the periphery of the packing-ring contacting with

the wall of the valve chamber 33 and forming an oil tight joint. It will be obvious from this that any adjustments or repairs of the valves may be readily made by removing the housing 10 from the crank-case and withdrawing the connected elements through the drain opening.

With an arrangement such as shown in Figure 5, the valves 35 and 39 may be opened by a single movement of the rod 26 to which the lever 37 is adapted to be connected by a wire or cable 22 as in the structure shown in the preceding figures of the drawings. This will insure a thorough draining of the splash-pan as well as of the sump of the crank-case, so that no residue of the worn-out oil will remain in the troughs 31 to dilute the fresh oil or reduce its viscosity.

It is manifest that our invention is not limited to the specific form of splash-pan shown in Figure 5. A pan of the customary type may be employed, the troughs or recesses being connected by tubing leading to a chamber as shown at 33; or, the pan may be hinged within the crank-case so that the actuation of the rod 26 will cause the oil to flow therefrom past the valves 35 and 39.

Having thus described our invention, the following is what we claim as new therein and desire to secure by Letters Patent:

1. A device for draining the interior of the crank-case of an internal combustion engine embodying a splash-pan and an oil sump, comprising a valve communicating with the drain opening in the oil sump base, means for directing the flow of oil from said oil-pan to said drain opening, a valve disposed in the path of oil flow from said pan to said drain opening and means capable of operation by a single movement to actuate said valves to permit the oil from said pan and from the sump to flow through said drain opening to the outside atmosphere.

2. A device for draining the crank-case of an internal combustion engine embodying a splash pan and an oil sump, comprising means of communication between the splash-pan and the drain opening of the sump, a valve for normally closing communication through said means, a valve for closing the drain opening, an actuating element located at a point distant from the engine and a connection between said element and said valves whereby said valves may be simultaneously operated to drain said splash-pan and said sump respectively externally of the crank-case.

3. Means for draining the crank-case of an internal combustion engine, embodying a splash pan and an oil sump, comprising a drain for said splash pan, valve mechanism associated therewith to normally close the drain opening, a drain located in the oil sump, a valve mechanism associated with said oil sump drain to normally close the same and means located at a point remote from said crank-case and adapted for manual operation to simultaneously unseat the valves of the respective valve mechanisms, whereby said splash pan and said oil sump may be drained externally of the crank-case.

THEODORE A. HAMMOND.  
PIERRE FRANK SONNEK.