Jan. 20, 1931. J. D'AGOSTINO 1,789,579

INTERNAL COMBUSTION ENGINE

Filed May 15, 1929 2 Sheets-Sheet 1

Fig. 1

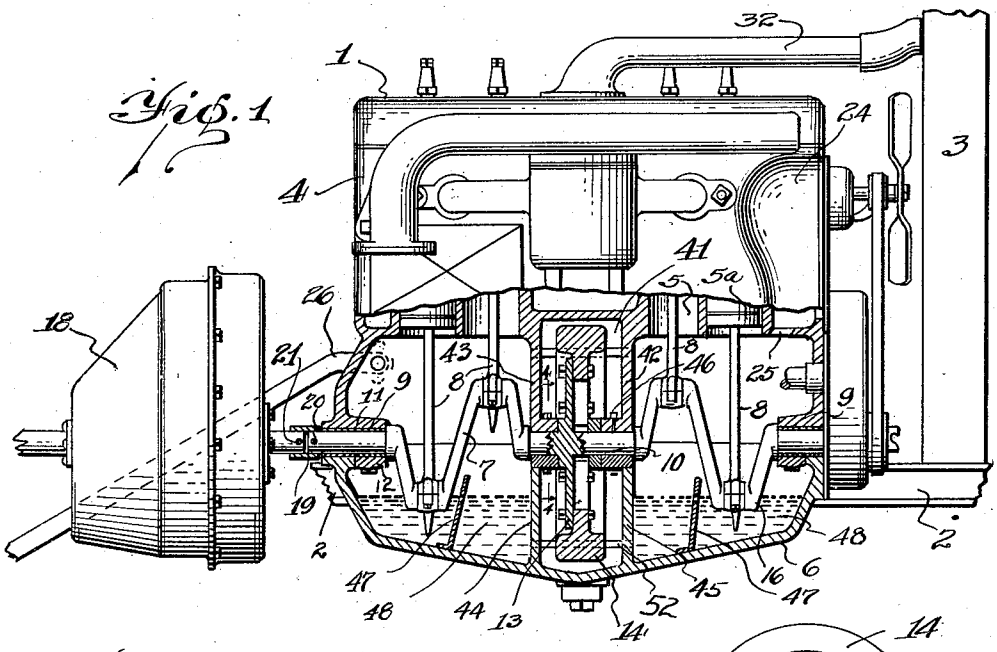


Fig. 2

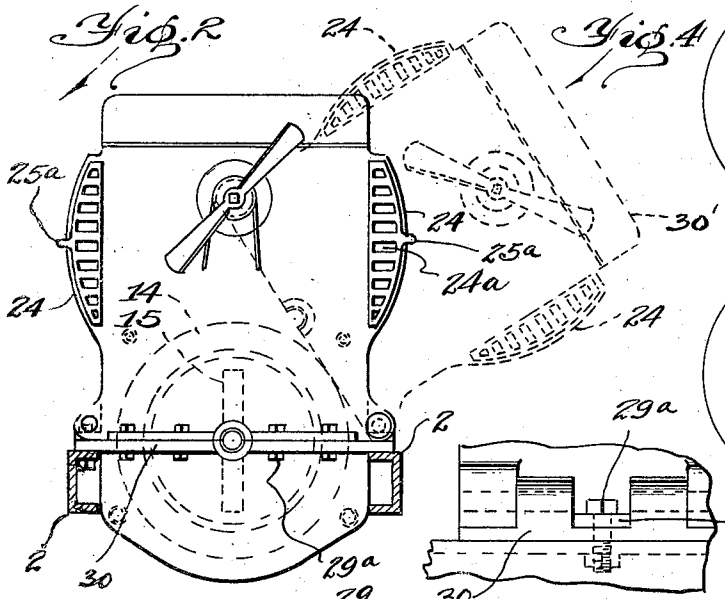
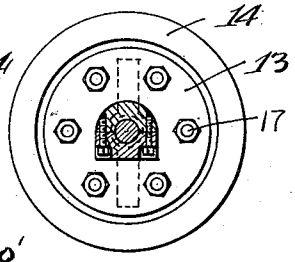


Fig. 4



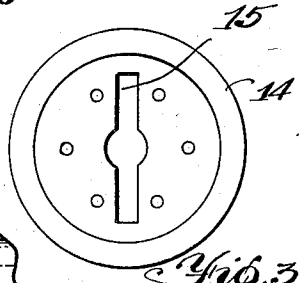


Fig. 3

Fig. 6

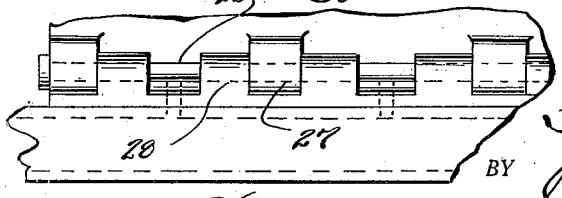


Fig. 5

INVENTOR.
Julius D'Agostino
BY
Stuart C. Barnes
ATTORNEY.

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INTERNAL COMBUSTION ENGINE

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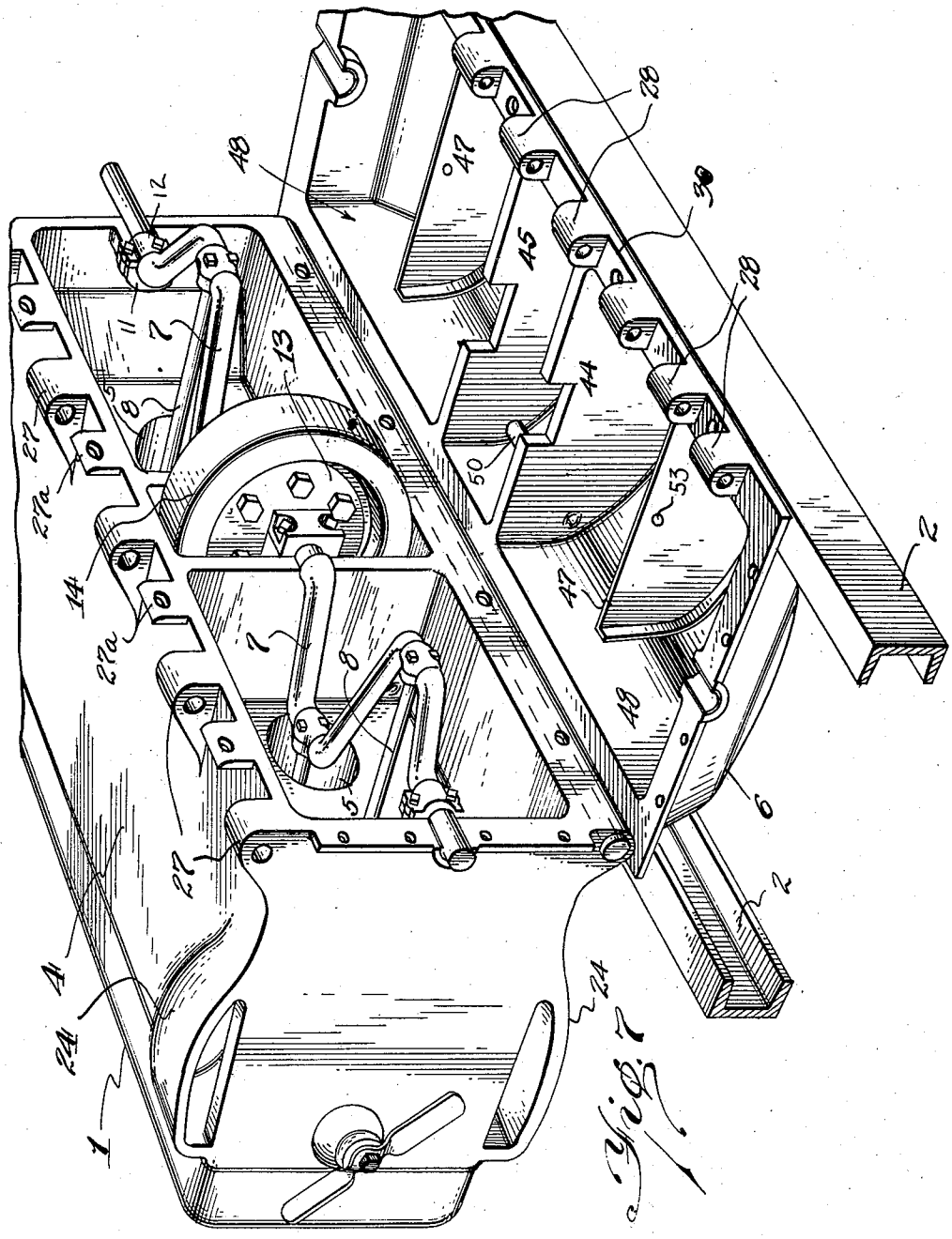


Fig. 1.

INVENTOR.
Julius D'Agostino.
BY
Stuart C Barnes
ATTORNEY.

Patented Jan. 20, 1931 1,789,579

UNITED STATES PATENT OFFICE

JULIUS D'AGOSTINO, OF DETROIT, MICHIGAN

INTERNAL-COMBUSTION ENGINE

Application filed May 15, 1929. Serial No. 363,117.

This invention relates to an internal combustion engine, and more particularly to an internal combustion engine which has a hinged cylinder block.

As now constructed, the flywheel of an internal combustion engine is positioned at one end of the crank shaft adjacent the end of the cylinder head block. This location of the flywheel tends to create a relatively large amount of vibration, and various means have been devised to dampen this vibration. It is one of the objects of this invention to locate the flywheel at the center of the crank shaft and in the middle of the cylinder head block. This location of the flywheel reduces to a minimum any vibrations set up by the flywheel.

As now constructed, it is a rather difficult thing to get at the heart of the internal combustion engine and it usually requires either that the mechanic get under the chassis or else that the engine be completely removed. It is a further object of this invention to provide a hinged cylinder block so that any repair to the crank shaft bearing and associated parts can easily be accomplished by merely swinging the cylinder block about its hinge to a side position.

In the drawings:

Fig. 1 is a side elevation of the hinged cylinder block partly broken away and showing the flywheel and a portion of the crank shaft in section.

Fig. 2 is a front elevation of the engine indicating in the dotted lines the position of the block when swung about either of its hinges.

Fig. 3 is an elevation of the flywheel.

Fig. 4 is a section along the line 4—4 of Fig. 1 showing the flywheel fixed to the crank shaft.

Fig. 5 is a detail view of the cylinder block hinge.

Fig. 6 is a detail view of the cylinder block hinge.

Fig. 7 is a perspective of the cylinder block in open position.

Referring more particularly to the drawings, the engine may be generally designated 1. No claim is made as to the manner of mounting the engine upon the chassis 2, and hence, any of the well-known ways of mounting the engine upon the chassis may be resorted to. The engine is arranged to be water cooled and for this purpose has the usual radiator 3.

The engine consists of the cylinder block portion 4 and of the crank case 6. The cylinder head 4 has the usual cylinders 5 bored therein with the customary pistons 5a which are connected to the crank shaft 7 by the connecting rods 8. The crank shaft 7 has a bearing 9 at each end and the central bearings 10. These bearings are of the usual type having an upper portion 11 integral with the cylinder block and a lower bearing portion 12 which is arranged to be bolted or suitably locked onto the upper bearing portion 11.

The crank shaft has the centrally located integral flange 13 and the flywheel 14, which is mounted centrally of the crank shaft and cylinder block, has the slot 15 which extends radially on each side of the center. In assembling the flywheel to the crank shaft, the flywheel is slid over the end of the crank shaft and the slot 15 is of such dimensions as to permit the passage therethrough of the wrist portions 16 of the crank shaft. The flywheel is positioned flush against the flange 13 and bolted securely thereto by means of the bolts 17 which pass through suitable coincident apertures in the flywheel and flange.

The transmission 18 is of any suitable type. The crank shaft 7 is jointed as at 19 and the two portions of the shaft are removably secured together by the collar 20 and pins 21. When the pins 21 are removed, the collar 20 can be slid to the left along the crankshaft past the joint 19 to permit hinging of the cylinder block.

In order to keep the oil (which is shown in the dotted lines) in the crank case cool, I have cast integral with the cylinder block, the air inlet conduit 24 which opens into the cylinder block just above the crank case as at 25. A suitable air conduit 50 passes around the flywheel and permits communication between the front and rear of the crank case. To the rear of the cylinder block immediately above the crank case, I have provided the outlet conduit 26 which may be extended lengthwise

to the rear of the car where it is preferably connected with the exhaust pipe to facilitate the suction of the air through the inlet conduit 24, then through the crank case 6, and thence into the atmosphere through the conduit 26. The inlet conduit is provided with suitable shutters 24*a* operated by the handle 25*a*.

The cylinder block has cast integral therewith the hinge ears 27, and the lugs 27*a*; and the crank case has cast integral therewith, or suitably fixed thereto, the hinge ears 28. A suitable pintle 29 is passed through these hinge ears. The side of the cylinder block opposite the pintle 29 may be bolted to the crank case by the bolts 29*a* which threadedly engage the lugs 27*a* of the cylinder block and the flange 30 of the crank case. Hence, after the bolts 29*a* have been removed, the cylinder block and associated parts including the crank shaft, as shown by the dotted lines 30′, in Fig. 2 and by Fig. 7, may be hinged about the pintle 29. It is understood that the cylinder block may be hinged on each side so that the block may be swung onto either side. It is also understood that before the cylinder block can be swung about the pintle 29, that the radiator hose 32, the exhaust ventilation conduit 26, the ignition wires, the exhaust manifold, intake manifold, and other readily detachable and standard parts which have not been shown, would first have to be disconnected.

The cylinder block is cast with a suitable recess 41 formed by the depending walls 42 and 43 of the cylinder. Immediately below the walls 42 and 43 are the complementary walls 44 and 45 of the crank case. The flywheel therefore is separated from the interior of the crank case and is arranged to be lubricated by suitable grease cups 46.

The engine is lubricated by the well-known splash system of lubrication. As is well-known upon ascending or descending a hill, the oil seeks the lowest level possible; and this often results in some of the cylinders receiving an insufficient supply of oil, depending upon whether the car is ascending or descending a grade. In order to maintain the oil from completely seeking the lowest level of the crank case when driving along a grade, I have provided the baffles 47. It is obvious that these baffles will maintain sufficient oil, for instance, in front of them, as at 48, when the car is going up grade, to assure the first and third cylinders a sufficient supply of lubricant. A suitable oil pipe 52 passes around the flywheel and permits flow of oil between the front and rear portions of the crank case. The baffles 47 are provided with the apertures 53 which allow flow of oil between the compartments divided off by the baffilles when the oil in any compartment attains the elevation of the aperture.

What I claim is:

1. In an internal combustion engine, the combination of a crank shaft having a centrally located thin web portion, a flywheel having a central opening and opposed radial slots whereby the said crank shaft can be passed through the said opening and slots in the flywheel to effect an engagement between the said web portion and the said flywheel, and means for removably securing the said flywheel to the said web portion.

2. In an internal combustion engine the combination of a crank shaft having an integral central web portion, a flywheel having a central opening and a slot whereby the said crank shaft can be passed through the said opening and slot in the flywheel to effect an engagement between the said web portion and the said flywheel, and means for removably securing the said flywheel to the said web portion.

In testimony whereof I affix my signature.

JULIUS D'AGOSTINO.