Nov. 23, 1948. E. P. PAXMAN 2,454,612

CONSTRUCTION OF INTERNAL-COMBUSTION ENGINES

Filed June 20, 1946 2 Sheets-Sheet 1

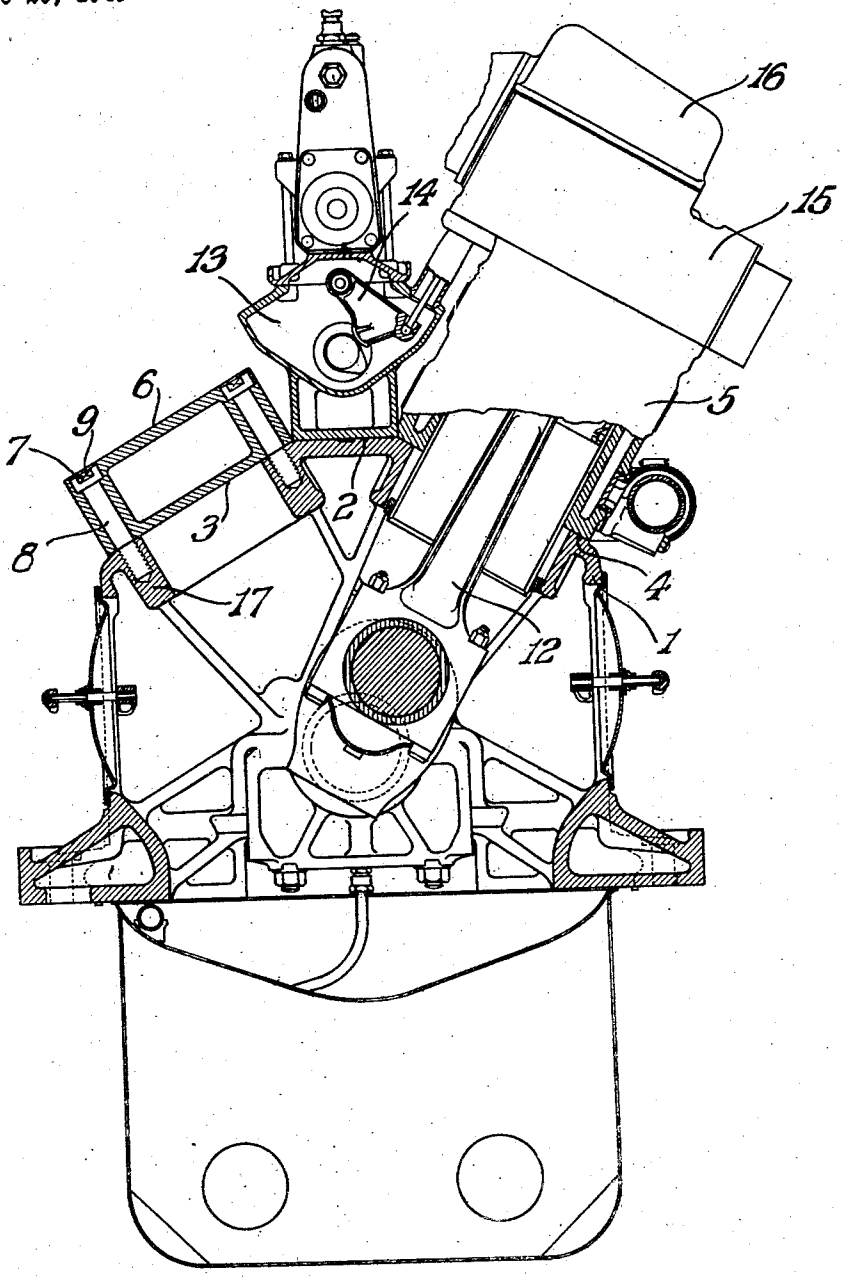


Fig. 1.

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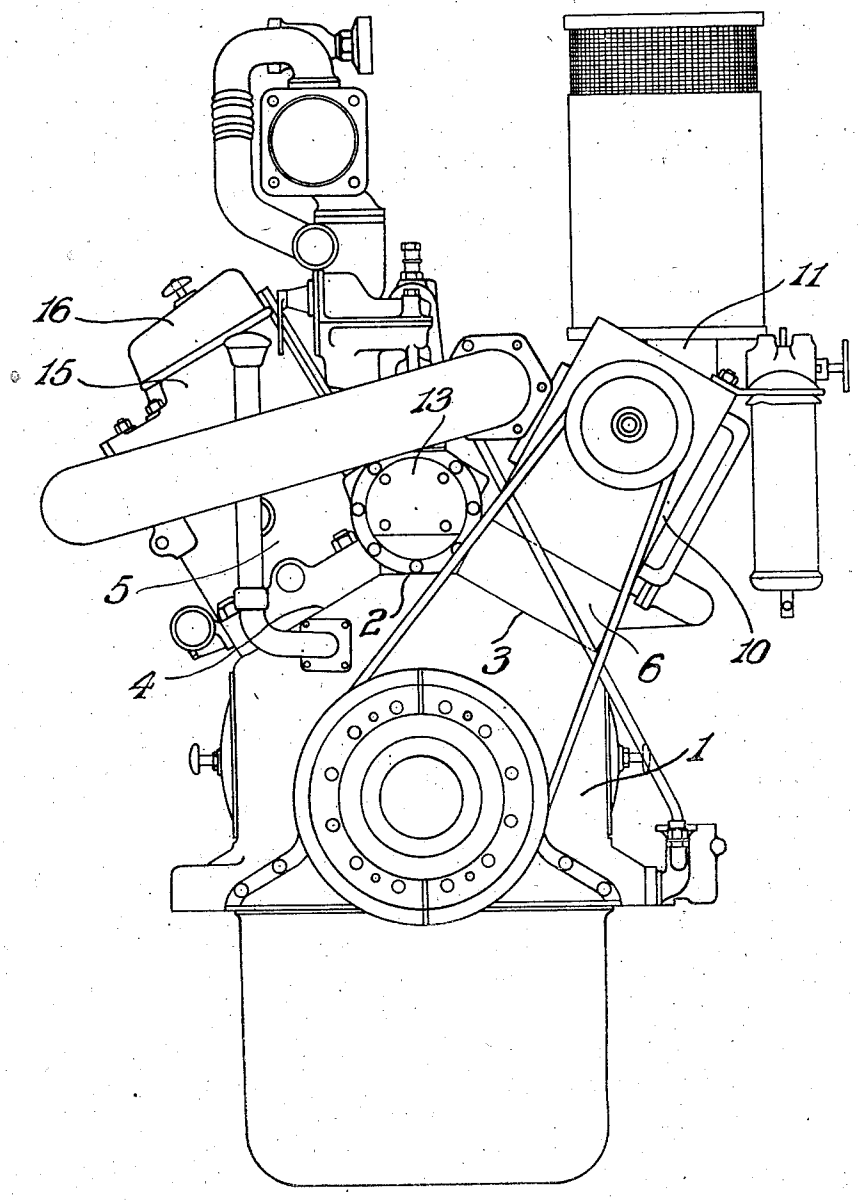


Fig. 2.

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2,454,612

CONSTRUCTION OF INTERNAL-COMBUSTION ENGINES

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In Great Britain December 8, 1944

5 Claims. (Cl. 121—194)

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This invention relates to internal combination engines of the kind described in prior U. S. application Serial No. 504,919, now Patent No. 2,429,105, granted October 14, 1947, and has for its object to provide improvements in the engine forming the subject of that specification designed to enable the system of constructing engines by building up from sub-assemblies therein described to be utilised for the construction of an engine having a single line of cylinders instead of the V-arrangement of cylinders to which the prior invention is applied.

According to the present invention an internal combustion engine is formed by superimposing cylinder and cylinder head components upon a crank case formed as in the said patent with three plane, uninterrupted joint faces on its upper surface, one of the inclined joint faces being utilised for the mounting of a row of cylinders, and the opposed inclined joint face being utilised as a seating for a platform designed to support auxiliary mechanisms such as a circulating water pump, auxiliary generator and supercharger.

Reference will now be made to the accompanying drawings which show an engine construction according to the invention and in which:

Fig. 1 is a cross-sectional elevation of the engine, and

Fig. 2 is an end elevation.

In the construction illustrated, the improved internal combustion engine construction comprises a crank case 1 whose upper surface is formed, as in said patent, with three joint faces namely, a central horizontal face 2 and two faces 3 and 4 inclined downwardly and outwardly from the said central face. The component surfaces in each of these three joint faces lie all in one plane for the purpose of facilitating machining. The inclined joint face 4 is adapted to support a row of cylinders 5 which, when installed, project at an inclined angle in the same manner as one set of cylinders in a V-engine. The cylinders 5 are surmounted by valve assemblies 15 and valve head units 16. On the opposite inclined joint face 3 which, according to the previous construction, would serve to support another row of cylinders, there is mounted according to the present invention an entablature 6 of sufficient depth to impart a portion of the strength normally given by the cylinder blocks in such a manner that the crank case will not be weakened by the absence of the cylinder blocks on one side while the engine is in operation. This entablature takes the form of a hollow box-like structure shown in Fig. 1 of rectilineal form which is fixed on to the crank case by utilising the tapped holes 17 therein which would otherwise be engaged by the studs or screws used to secure the cylinder blocks in place. The heads or nuts 7 on the securing screws 8 or the like for the entablature are preferably sunk in sockets 9 so as to lie below its upper surface which is thereby made to provide a smooth platform on which other engine auxiliaries can be supported. The entablature itself is preferably provided with a number of bolt sockets or tapped holes arranged so that components of the engine (shown in Fig. 2) such as the fuel oil filter 10, the pressure charger 11 and the circulating water pump can be mounted upon the upper surface of the said entablature.

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With the arrangement above described employing only a single bank of cylinders, the connecting rods 12 can be the type necessary for a straight line engine and not of the more complex type required where connecting rods from two banks of cylinders engage a common crank shaft.

On the horizontal joint face 2 of the crank case a cam box assembly 13 constructed and arranged in substantially the same manner as described in our said patent can be arranged although the cam rockers 14 will operate through one side only owing to the fact that only one row of cylinders is employed.

The invention possesses the advantage that no constructional alterations are necessary in the crank case when it is desired to build up an engine from preformed sub-assemblies as described in aforesaid patent. Where a straight-line engine is required the assembly procedure is exactly as before except that the entablature 6 is fixed in place of one set of cylinders. The capacity of such an engine can be very easily increased, however, as it is only necessary to remove the entablature and replace it by a row of cylinders to form a V-type engine of the kind disclosed in the aforesaid patent.

I claim:

1. An internal combustion engine comprising cylinder and cylinder head components superimposed upon a crank case formed on its upper surface with a central horizontal joint face and a pair of joint faces inclined from the respective sides of said central joint face and merging therewith at their longitudinal edges, one of the inclined joint faces providing means for mounting a row of cylinders thereon, the central horizontal joint face providing means for supporting a cam box assembly thereon, and the second inclined joint face providing a seat for a

platform designed to support auxiliaries of the engine.

2. An internal combustion engine as defined in claim 1, wherein one of said inclined joint faces is adapted to receive a row of cylinders, and the other of said inclined joint faces is adapted to receive interchangeably another row of cylinders or said platform.

3. An internal combustion engine as defined in claim 1, wherein said platform comprises a rigid entablature of hollow box-like form the upper surface of which is smooth and provides said platform, and means for securing the entablature rigidly to said second inclined joint face and thereby impart rigidity to the crank case.

4. An internal combustion engine as defined in claim 1, wherein said platform is constituted by a rigid entablature which is interchangeable with a row of cylinders like said row of cylinders mounted on the other of said inclined joint face and adapted to be bolted in position on said second inclined joint face of the crank case during assembly of the engine.

5. An internal combustion engine comprising

a crank case formed at its upper part with three plane uninterrupted joint faces including a central horizontal joint face and two joint faces inclined from the respective sides of said central joint face and merging therewith at their longitudinal edges, said inclined joint faces having means for removably securing rows of cylinders thereon, and a rigid entablature of rectilineal form adapted to be removably secured to one of said inclined joint faces interchangeably with one of such rows of cylinders and having a plane upper surface to receive auxiliary components of the engine.

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