Oct. 11, 1949. A. LEE 2,484,516

METHOD FOR ASSEMBLING THE CYLINDERS OF A RADIAL ENGINE

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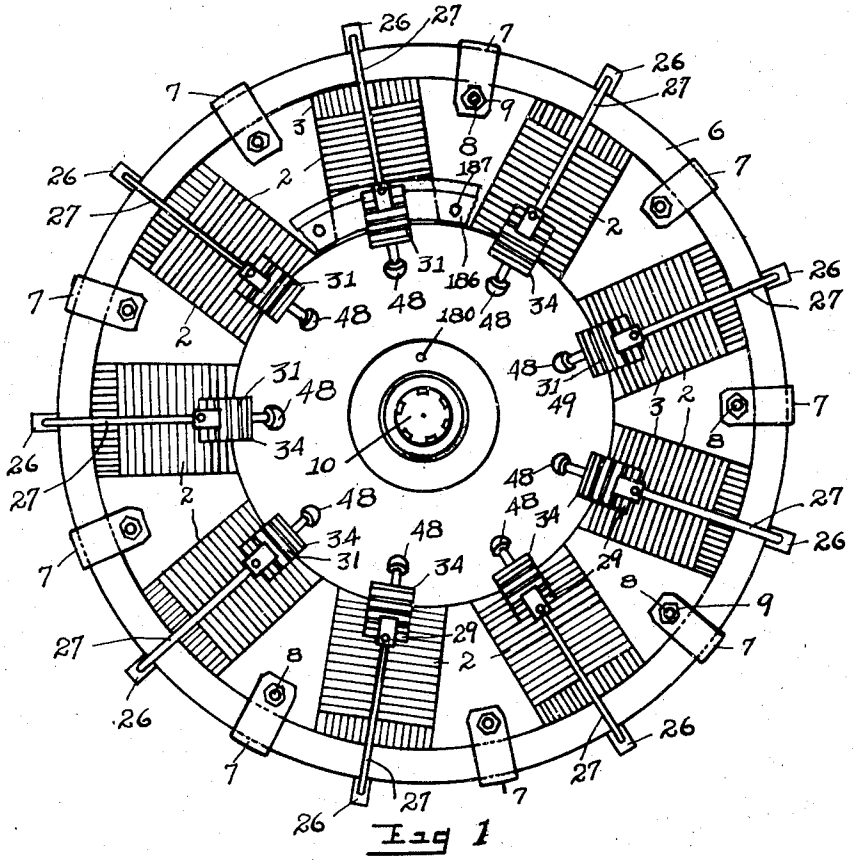


Fig 1

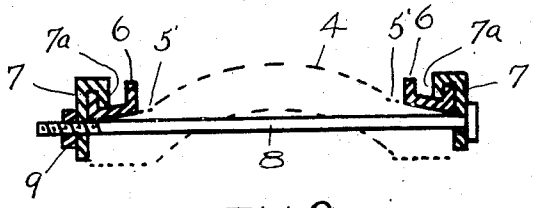


Fig-2

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METHOD FOR ASSEMBLING THE CYLINDERS OF A RADIAL ENGINE

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3 Claims. (Cl. 121—194)

1

My invention relates to a dual compression ignition engine. I declare the following to be a full, clear, concise and exact description thereof sufficient to enable anyone skilled in the art to which it appertains to make and use the same reference being had to the accompanying drawing in which like reference characters refer to like parts throughout the specification.

The object of the invention is to provide an internal combustion engine in which the fuel charge is ignited by compression. The engine substitutes inlet and exhaust ports in the cylinders for valves for the admission of air and for scavenging the products of combustion. The said inlet and exhaust ports in the cylinders are governed by dual parallel pistons moving in unison in dual parallelly disposed cylinders.

The engine is constructed with a plurality of said dual cylinders arranged in radial relation to a common crank shaft. Each of said cylinders is fed and timed by a variable stroke bellows pump which is actuated by a single automatic advance variable lift cam having a tapered surface for elevating the mechanism for actuating the bellows pump, whereby to meter and time the injection of the fuel into the cylinder.

There is employed annular bands or hoops for holding the plurality of cylinders and crank case in assembled position about the crankshaft, whereby said bands absorb all strains and stresses.

The invention is designed also to permit of a greater number of power units or cylinders arranged radially around the crank case than heretofore by the use of annular stress bands or hoops above mentioned, which encircle all cylinder heads, whereby to hold said cylinder and crank case in assembled position.

Heretofore, the cylinder were spaced from each other necessarily for the reason that it was necessary to leave space for bolts used to hold said cylinders in place around the crank case. The present construction eliminates the use of bolts. Furthermore, the hoops or bands permit not only a closer clustering but also a larger number of cylinders around a smaller and lighter crank case, thereby considerably reducing wind resistance.

Fig. 1 is a side elevation of the device.

Fig. 2 is a detail enlarged view showing a transverse section of the annular channel bands and immediate parts connected thereto.

Referring more particularly to the drawing, the crank casing of the engine is represented by 1 from which radiate nine dual pairs of cylinders 2, 2 provided with fins 3 for radiating heat. Each dual pair of cylinders 2, 2 has a common head 4

2

having shoulders 5', 5' for fitting to the outer ends of cylinders 2, 2. The plurality of heads 4 are held together by two annular channel shaped bands or hoops 6, 6 slidingly mounted on the tapered outer surface of heads 4. Brackets 7, 7 having hooks 7a engage the peripheral rim of bands 6, 6. Said brackets are held together by cross rods 8 having heads at one end and nuts 9 at the other. Said cross rods 8 are disposed between cylinders and may be tightened to draw bands 6, 6 against shoulders 5' of heads 4. Said bands 6, 6 thus encircling the whole number of heads 4 and tend to compress said heads 4 and their respective cylinders 2 and the crank case 1 towards a common center into one compact mass or unit about the crankshaft 10.

Fig. 1 shows also pumps 31, tubes 27 connected to said pumps, nozzles 26 attached to said tubes 27, guide bearings 48, annular casing 186 and bolts 187 for securing it to an auxiliary casing, not shown.

In operation after the cylinders 2 are assembled the annular channel shaped bands 6, 6 are mounted laterally from each side of cylinders 2 upon the outer inclined or tapered surfaces of heads 4. Brackets 7 are then applied to the annular channel shaped members 6 with their hooks 7a engaging said channel members 6 and bolts 8 projected through said brackets 7. Nuts 9 are then tightened on bolts 8 to draw annular channel shaped members 6, 6 towards each other up the inclined tapered outer surfaces of the cylinder heads 4, whereby to compress said heads 4 and their respective cylinders 2 and crank case 1 towards a common center or into one compact mass or unit about the crankshaft 10.

Having thus described my invention, what I claim is new and desire to secure by Letters-Patent is as follows:

1. In a dual compression ignition engine, a plurality of cylinders arranged in a circle, heads of said cylinders having tapered surfaces, bands engaging said tapered surfaces, brackets engaging said bands and rods connecting said brackets and means mounted on said rods, whereby to draw said brackets and bands towards each other to hold the cylinders in assembled position.

2. In a dual compression ignition engine, a plurality of cylinders arranged in a circle, heads on said cylinders having tapered surfaces, annular channel bands engaging said tapered surfaces, brackets engaging said bands, rods connecting said brackets, and nuts mounted on said rods, whereby to draw said brackets and bands towards

each other to hold the cylinders in assembled position.

3. In a dual compression ignition engine, a plurality of cylinders arranged in a circle, heads on said cylinders having tapered surfaces, annular channel bands having grooves engaging said tapered surfaces, brackets having hooks engaging said bands, rods connecting said brackets and nuts mounted on said rods, whereby to draw said bands towards each other to hold the cylinders in assembled position.

ABE LEE.

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