April 5, 1932. O. SIMMEN 1,852,437

INTERNAL COMBUSTION ENGINE DRIVEN VEHICLE WITH ELECTRIC TRANSMISSION

Filed Feb. 12, 1930

Fig.2.

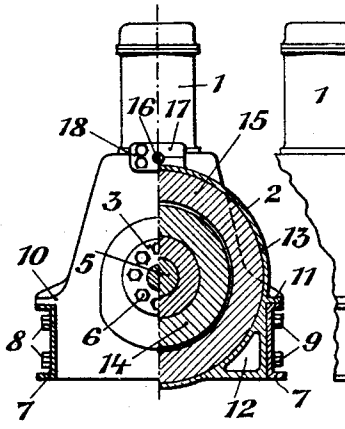


Fig.1.

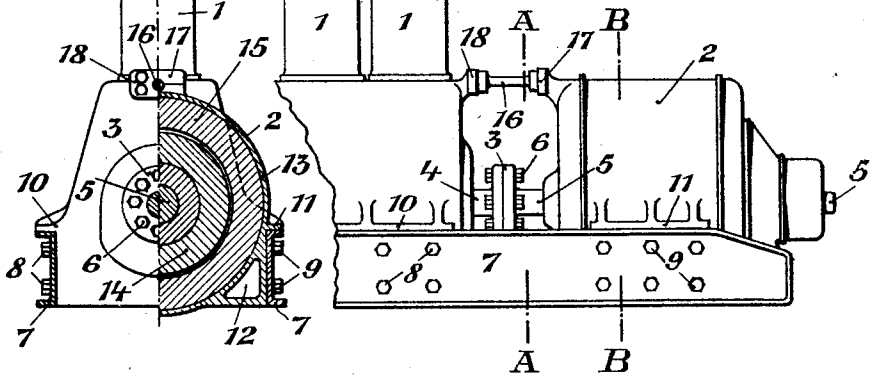


Fig.4.

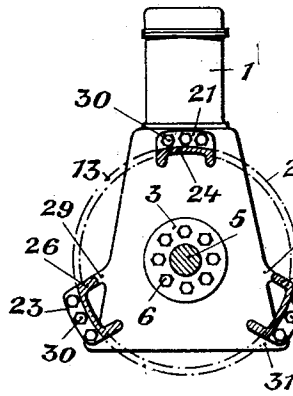
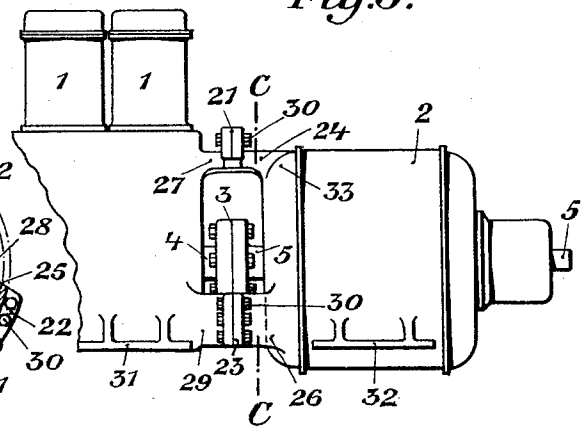


Fig.3.



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UNITED STATES PATENT OFFICE

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INTERNAL COMBUSTION ENGINE DRIVEN VEHICLE WITH ELECTRIC TRANSMISSION

Application filed February 12, 1930, Serial No. 427,978, and in Switzerland June 13, 1929.

This invention relates to vehicles of the kind in which the power developed by an internal combustion engine is transmitted electrically through a generator coupled to the engine, and has for its object to provide an improved connection between the engine and generator.

According to this invention the engine shaft is detachably but rigidly coupled to the generator shaft and the generator casing is connected at several points to the engine or its casing in a manner which eliminates vibrations between these two separate units without entailing loss of accessibility to the bearings and the coupling of their adjacent shafts.

Preferably the engine and generator casings are connected at three points to ensure a rigid structure, and these three points are so determined as to form an equilateral triangle, the shaft passing through the centre of gravity of the triangle and in a plane at right angles to its surface.

In practice the engine and generator may each be bolted to a common parallel sided frame and connected at a third point by directly engaging lugs on each unit or by means of some intermediate or interposed member. Alternatively the engine and generator casings may be directly coupled at all three points as by bolts passing through forwardly projecting lugs at the adjacent end of each unit or by means of an intermediate member at one of these three points.

Two constructional forms according to this invention are diagrammatically illustrated by way of example in the accompanying drawings in which

Figure 1 is a side elevation,

Figure 2 is a cross-section, the lefthand side of the figure being taken on the line A—A and the right on the line B—B of Figure 1,

Figure 3 is a side elevation of a modified construction, and

Figure 4 is a cross-section on the line C—C of Figure 3.

In the construction illustrated two cylinders 1 of a Diesel internal combustion engine are shown, the engine shaft 4 being connected by a flanged shaft coupling 3 to the shaft 5 of the generator 2.

In the construction shown in Figures 1 and 2, the engine and generator are each furnished with laterally projecting lugs 10 and 11 respectively by which these units are supported upon the parallel sides of a bed or frame 7. The engine casing is bolted to the frame by studs 8 and similarly bolts or studs 9 are employed to hold the side ribs 12 of the generator casing 13 in place between the frame members 7.

The adjacent ends of the engine shaft 4 and the generator shaft 5 are provided with integral flanges in the usual manner and these are connected by bolts 6 to form a rigid coupling.

To prevent the two units vibrating and adversely affecting the drive a third point of connection is provided between the engine casing and generator casing in the form of an intermediate member 16 which is rigidly screwed into a flange 18 on the engine casing and into a corresponding flange 17 on the generator casing. This arrangement prevents any vibrations which might take place in a horizontal plane at right angles to the axis of the shaft.

In the alternative construction shown in Figures 3 and 4 the generator shaft 5 is rigidly but detachably connected to the engine shaft as in the previous construction, but the engine and generator casings are connected at the three points 21, 22 and 23, the generator casing being furnished with projecting lugs 24, 25, 26 cast in one with the end cover 33 and preferably of channel section as shown in Figure 4, these lugs being connected by bolts 30 to similar lugs 27, 28 and 29 formed in one with the casing of the engine.

It will be seen that the three points of connection 21, 22, 23 form the points of an equilateral triangle through the centre of which the coupled shafts 4, 5 pass so that vibrations in any direction are prevented.

I claim:

In an internal combustion engine in which the power is electrically transmitted by an electrical generator, a rigid but demountable coupling between the shafts of the engine

and generator, a common horizontal frame for the engine and generator, these two latter being independently connected to and supported by said frame, a separate connection between said generator and said engine consisting of an independent rigid body demountably attached at one end to the generator cover and at the other end to the engine crank-case and lying above said shafts, said member taking all the vibration stresses off said coupling, said member being removable by hand to expose at least two-thirds of the periphery of the coupling.

In testimony whereof I have affixed my signature.

OSCAR SIMMEN.