May 4, 1937. M. P. WOLFE 2,079,391

RESILIENT ENGINE MOUNTING

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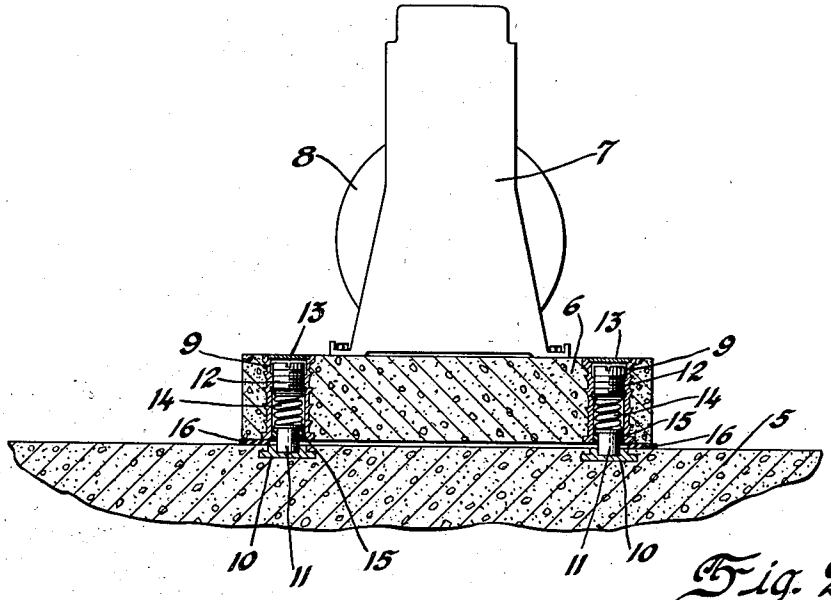


Fig. 2

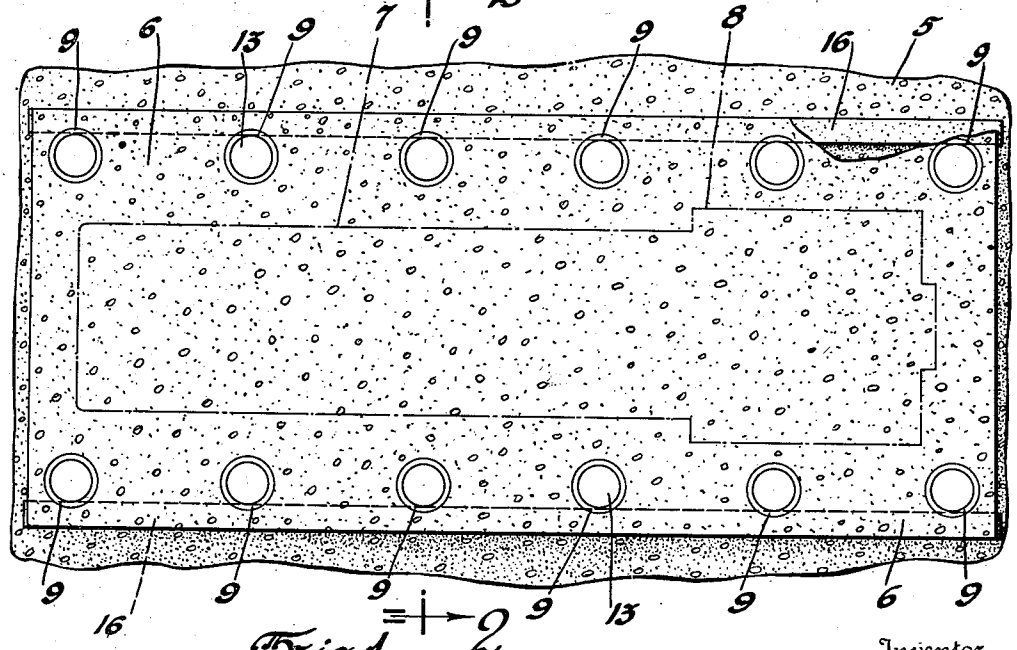


Fig. 1

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RESILIENT ENGINE MOUNTING

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1 Claim. (Cl. 248—21)

My invention relates to engine supporting or mounting devices for supporting internal combustion engines, steam engines, and similar machines or devices which vibrate or tend to vibrate when they are in operation; and the object thereof is to prevent vibration of the engine or equivalent device thus supported from being transmitted to the building wherein it is located, or to the base or floor whereby the same is supported. My invention includes a massive slab of concrete or equivalent material which forms the immediate supporting member for the engine, which slab is supported from a suitable base which may be a floor of a building, or a concrete block resting upon the ground upon which the building rests; said slab being supported from the base by means of a series of springs which support the same as well also as the engine or other mechanism which rests upon the slab. My invention is in the nature of an improvement upon the engine supporting means to which the application for patent for Spring type vibration insulating apparatus, filed by George D. Pogue, upon August 29, 1934, Serial Number 742,018, relates; and the particular object of my invention is to prevent violent oscillation of the engine and its supporting slab, due to torque reaction when the engine is started, and when it is stopped, from being transmitted to the building at such times. This oscillation of the engine and its support is independent of the vibration which occurs when the engine is in operation, and is of much greater magnitude and differs in frequency from the rate of vibration of the engine and slab when the engine is in operation; and apart from the effect which such oscillation has as regards communicating vibration to the building, it subjects the piping system leading to and from the engine to severe strain if it is not restrained.

In the drawing submitted herewith:

Figure 1 is a view showing my improved engine mounting means in plan, the position of an engine supported thereby appearing upon the slab whereby the engine is supported.

Figure 2 is a view showing a section thereof upon a vertical transverse plane indicated by the line 2—2, Figure 1.

Referring now to the drawing, the numeral 5 designates a suitable or available base which is ordinarily a floor of a building, or the ground upon which it rests, the same being shown conventionally as a moulded concrete mass or structure having a flat and smooth upper surface; and the numeral 6 designates a massive slab upon which the engine, shown conventionally at 7, rests, and which slab provides the immediate support therefor. This slab is preferably, and is shown conventionally, as a moulded mass of concrete; and it extends throughout and preferably beyond the two ends of the engine 7 and a dynamo 8 commonly driven thereby. Said slab is substantially wider than the base parts of the engine and dynamo which rest upon the upper surface thereof, as indicated upon Figure 1 of the drawing; so that supporting springs within a series of spring housings 9 spaced along the sides of the slab, and which serve to support the slab and the engine from the base 5, may be conveniently adjusted from the upper side of the slab to thereby insure that individual springs shall carry equal parts of the total load, represented by the slab and the engine or other device supported thereupon; and which springs, collectively, support the slab and the engine when the invention is in use.

The spring devices for supporting the slab 6 comprise base plates 10 properly spaced and embedded within the concrete base 5, and which plates in turn support upwardly extending plungers 11 which extend into the cylindrical spring housings 9 as shown. These housings are internally threaded adjacent their upper ends, and threaded abutments 12 are adjustable up and down within the housings, after the covers 13 thereof have been removed. Springs 14 are housed within the spring housings and the tension of these springs may be made uniform by adjusting the abutments 12 within the housings. Resilient tubular sleeve members 15 preferably surround the plungers 11 to restrain sidewise movement of the slab.

In installing my improved engine mounting the plates 10 are properly spaced and embedded in the concrete base 5 as above explained. A sheet of paper or other scheme to prevent the slab from sticking to the base is then spread over the base; the spring housings are properly located over the base plates by the plungers 11 and sleeve members 15, or otherwise; a suitable form for the slab is set up; and concrete is then poured into the form and about the spring housings. After the concrete of the slab has set the plungers 11 and sleeves 15, if not already in place to locate the housings as aforesaid, the springs 14, and the abutments 12 are put in place, and the engine is fastened to the slab as by suitable bolts embedded therein. Then and when the engine is ready to run the slab and engine are raised slightly from the base by screwing down the abutments 12 and adjusting them so as to dis-

tribute the load uniformly among the several springs.

The resilient mounting provided as aforesaid serves to prevent vibration of the engine, when running, from being transmitted to the building wherein the engine is located. When the engine is started or stopped, however, which obviously occurs frequently after the engine has been installed, violent oscillation is set up in the slab, due to torque reaction, at such times. This oscillation is of much greater magnitude than vibration due to the running of the engine after it is started; it is more or less irregular and erratic; and if not suppressed such oscillation will result in excessive vibration at starting and stopping which tends also to rupture the piping system leading to and from the engine.

In order, therefore, to suppress and prevent, as far as possible, oscillation of the engine and its supporting slab when the engine is started or stopped my invention contemplates the placing of resilient members, made preferably of rubber or equivalent material, and which members are preferably in the form of long narrow strips, between the under side of the slab and the upper surface of the base; these being put in place after the slab has been lifted by the abutments 12 as will be appreciated. Such strips are preferably located along the outer side edges of the slab, as indicated by the numerals 16, and they serve as cushions to dampen oscillation of the slab and engine when the engine is started or stopped. They support little or none of the load, although the slab may be lowered slightly to hold them firmly in place; the load when the engine is running being supported by the springs. Such strips, however, serve to restrain and prevent oscillation of the base, due to torsion reaction, when the engine is being started and stopped and, being located as far as practicable from the longitudinal center line of the slab, they act to prevent such oscillation although they do not have to resist forces of magnitudes measured by the weight of the slab and engine supported thereby. When the engine is in operation the strips support little or no load; and the springs prevent vibration of the engine from being transmitted to the building wherein the same is located after the engine has been started and is running.

Having thus described and explained my invention I claim and desire to secure by Letters Patent:

In engine mounting of the class described and in combination with a base; a moulded concrete slab located above said base and serving as a support for an engine; a plurality of tubular spring housings open at both their ends embedded in said slab, and spaced along the side edges thereof and located outside the base of an engine supported thereupon; independently adjustable springs arranged one within each of said housings, and which springs support said slab above and spaced slightly from said base; means within said housings and accessible through the open upper ends thereof for varying the tension of the springs within said housings; and strips of rubber held in place between the upper surface of said base and the lower surface of said slab and extending along the outer side edges of said slab.

MERRILL P. WOLFE.