

W. E. VER PLANCK.
SUPPORTING MEANS FOR ENGINES.
APPLICATION FILED SEPT. 13, 1917.

1,295,644.

Patented Feb. 25, 1919.

Fig. 1.

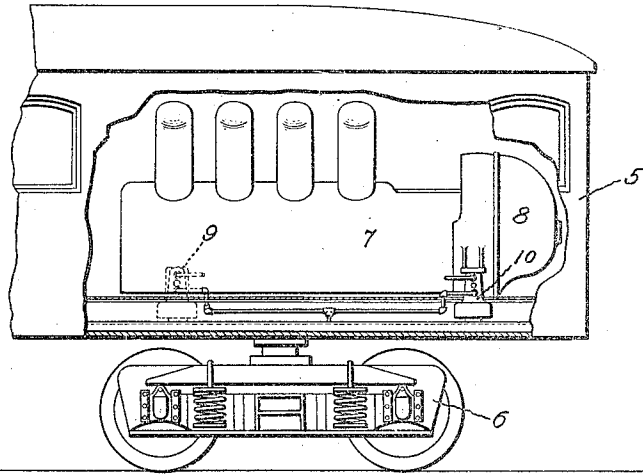
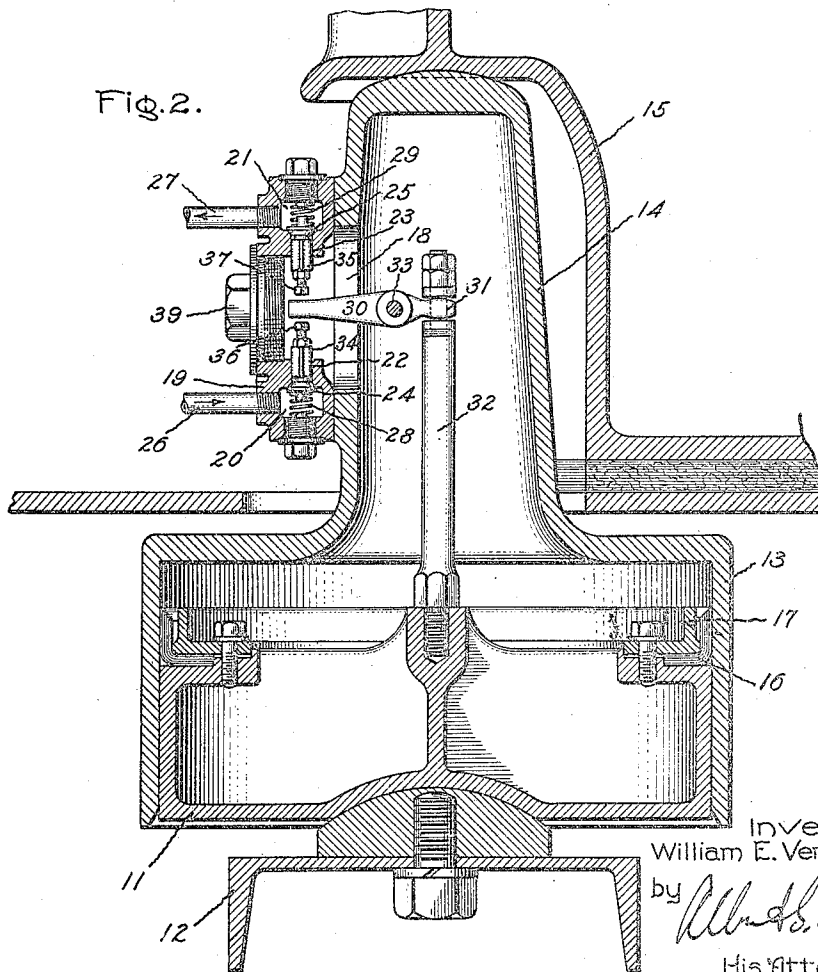


Fig. 2.



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UNITED STATES PATENT OFFICE.

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SUPPORTING MEANS FOR ENGINES.

1,295,644.

Specification of Letters Patent.

Patented Feb. 25, 1919.

Application filed September 13, 1917. Serial No. 181,152.

To all whom it may concern:

Be it known that I, WILLIAM E. VER PLANCK, a citizen of the United States, residing at Erie, county of Erie, in the State of Pennsylvania, have invented certain new and useful Improvements in Supporting Means for Engines, of which the following is a specification.

The present invention relates to means for supporting engines, and more especially to supporting internal combustion engines on self-propelled vehicles, which are direct-connected to and drive electric generators, the latter supplying current to electric motors mounted on the vehicle axles. With such installations it is desirable to prevent the vibrations of the engine from being transmitted to the vehicle frame and body, and the object of the invention is to provide an improved support for the engine which will accomplish this result in a most efficient manner.

For a consideration of what I believe to be novel and my invention, attention is directed to the accompanying specification and the claims appended thereto.

In the drawing, Figure 1 is a diagrammatic view of a portion of a vehicle with an engine driven generator supported thereon, and Fig. 2 is a vertical section through a support.

In carrying out my invention I support the engine and generator on fluid cushions, a three-point support being preferably utilized as this possesses certain known advantages in the way of simplicity in alining and adjusting. These fluid cushions comprise a cylinder and piston arrangement, one of which is stationary and the other movable, the engine and generator being directly supported on the movable element. In connection with each fluid cushion, I provide automatic means for admitting compressed fluid thereto when the movable element reaches a predetermined low position, and to this end I provide a suitable valve which is opened to admit compressed fluid to the cylinder, the valve being opened when the support reaches such low position. If found desirable, I also provide a second automatically opened valve for relieving the pressure in the cylinder when the movable element reaches a predetermined high position. In the case of a vehicle, as above referred to, the fluid cushion may utilize air as its op-

erating fluid, which may be taken from any suitable source, as the air brake pipe.

Referring to the drawing, 5 indicates a vehicle body, and 6 a truck supporting one end of the same. In the vehicle is an internal combustion engine 7 to which is direct connected a generator 8. These are shown only in outline, as their structures form no part of the present invention. The engine and generator are preferably provided with a three-point support, two supports being located at one end and one at the other. In the present instance, one support is located under the engine, as indicated at 9, the other two being located one on each side of the generator, as indicated at 10.

Referring now to Fig. 2, each support comprises a stationary piston 11 supported on a sill 12 of the vehicle body, and a movable cylinder 13 which fits over the piston 11 and is provided with a projecting head 14 on which rests the frame of the engine or generator, as the case may be, the same being indicated at 15. The cylinder and piston make a close fit with each other and between them is a packing 16 held in place on the stationary piston by a ring 17. In the head 14 is an opening 18 over which fits an annular member 19 having two diametrically opposite chambers 20 and 21 which are in communication with the cylinder 13 through passages 22 and 23 in which are located outwardly opening valves 24 and 25. Connected with chamber 20 is a pipe 26 which may lead from any suitable source of fluid pressure supply, as, for example, the air brake pipe of the vehicle, and connected with the chamber 21 is a discharge pipe 27. The valves 24 and 25 are pressed to their seats by springs 28 and 29, and are adapted to be opened by a lever 30 pivoted at one end, as indicated at 31, to a post 32 on the stationary piston 11, and connected at an intermediate point 33 to the movable head 14. The valves 20 and 21 are provided with guide stems 34 and 35 in the ends of which are adjustable bolts 36 and 37 with which the end of lever 30 is adapted to engage. 38 is a plug which closes the opening through the annular member 19. When removed it renders the bolts 36 and 37 accessible for adjustment.

In operation, when the cylinder 13 moves downward, the left-hand end of lever 30

also moves downward turning about the stationary fulcrum 31. At a predetermined low point the end of lever 30 will strike the bolt 36, thus opening valve 24 and admitting compressed fluid to the cylinder 14. This will increase the pressure in the cylinder and cause it to rise and move the lever 30 away from valve 24 so as to permit the valve to close. On the other hand, if for any reason the pressure becomes too great, causing the cylinder to rise too high, then in a similar manner the valve 25 will be opened to relieve the excess pressure. By this arrangement just the desired pressure can be always maintained within the cushioning device. By utilizing cushioning devices having large clearances so that substantial cushioning movements may be had, the same will act like springs having very great deflections. An arrangement as described has, however, substantial advantages over a spring arrangement, both in the matter of uniformity of action and in the prevention of vibrations being transmitted to the vehicle body.

In accordance with the provisions of the patent statutes, I have described the principle of operation of my invention, together with the apparatus which I now consider to represent the best embodiment thereof; but I desire to have it understood that the apparatus shown is only illustrative, and that the invention can be carried out by other means.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In an apparatus of the character described, the combination of an engine, fluid cushions for supporting it, and means controlled by the movements of the cushions for

automatically regulating the pressure in said fluid cushions, said means admitting fluid upon a predetermined movement in one direction and venting fluid upon a predetermined movement in the opposite direction whereby said engine is positioned within certain limits.

2. In combination, a support, an engine, and fluid cushion means carried by the support for sustaining the weight of the engine, said fluid cushion means comprising a cylinder and piston which are movable relatively to each other, and valve means actuated by the movements thereof for regulating the pressure within the cylinder, said valve means admitting fluid upon a predetermined movement in one direction and venting fluid upon a predetermined movement in the opposite direction whereby said engine is positioned within certain limits.

3. The combination of a vehicle, an engine, and means for supporting the engine on the vehicle so as to prevent vibrations of the engine being transmitted to the vehicle body, said means comprising a cylinder and piston movable relatively to each other, a pipe for supplying fluid under pressure to the cylinder, a pipe for venting fluid from the cylinder, valves in said pipes, said valves being normally closed, and means controlled by the relative movements of the cylinder and piston which opens the valve in the supply pipe when the engine moves down a predetermined amount and opens the valve in the vent pipe when the engine moves up a predetermined amount.

In witness whereof, I have hereunto set my hand this 8th day of September, 1917.

WILLIAM EVERETT VER PLANCK.