May 21, 1963 J. D. YANDA 3,090,463

ENGINE VACUUM SOUND BARRIER

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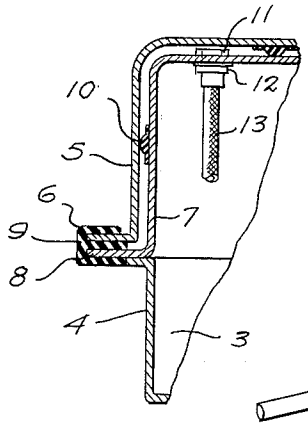


FIG. 4.

FIG. 1.

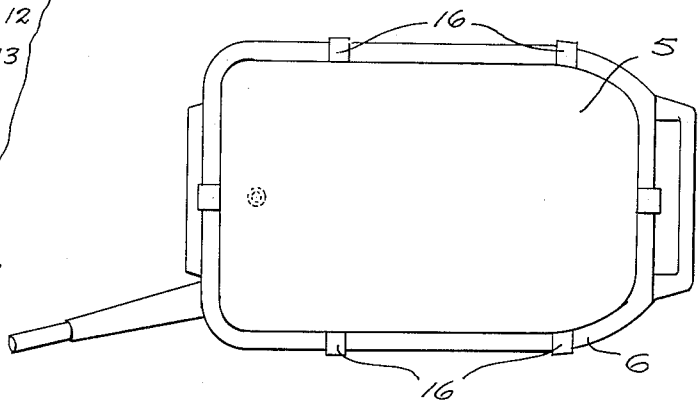


FIG. 2.

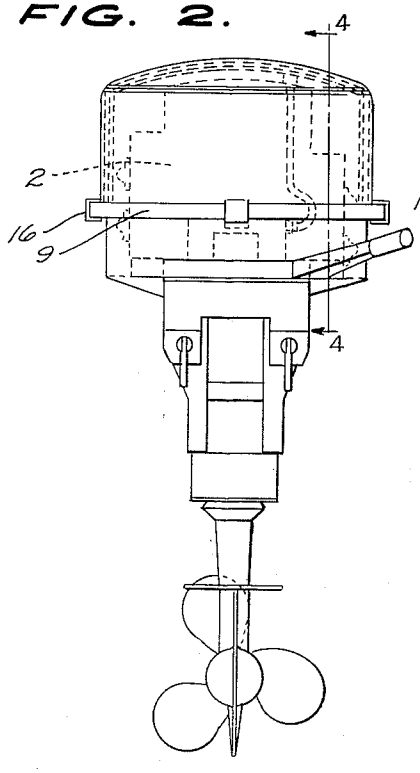
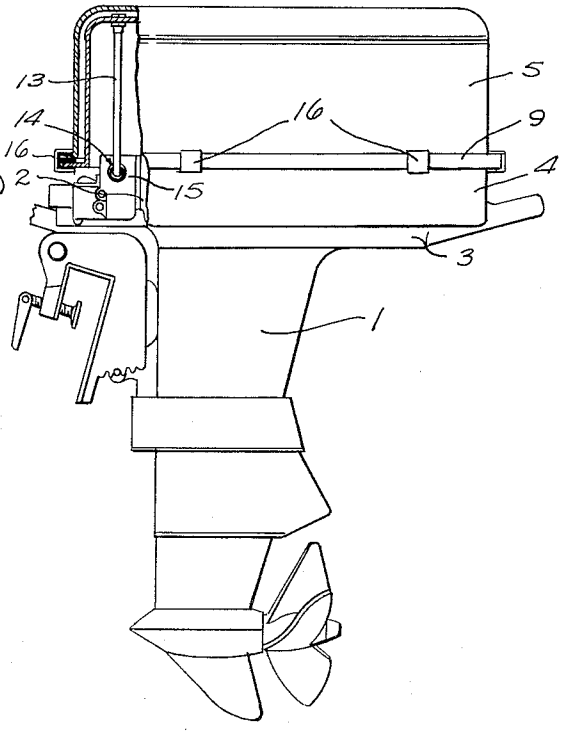


FIG. 3.



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FIG. 5.

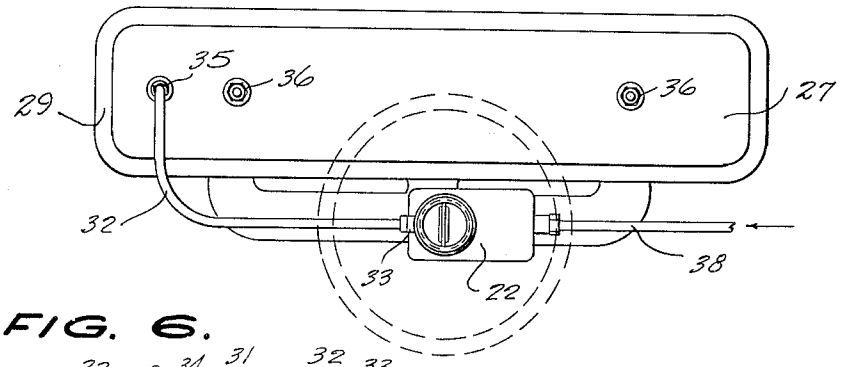


FIG. 6.

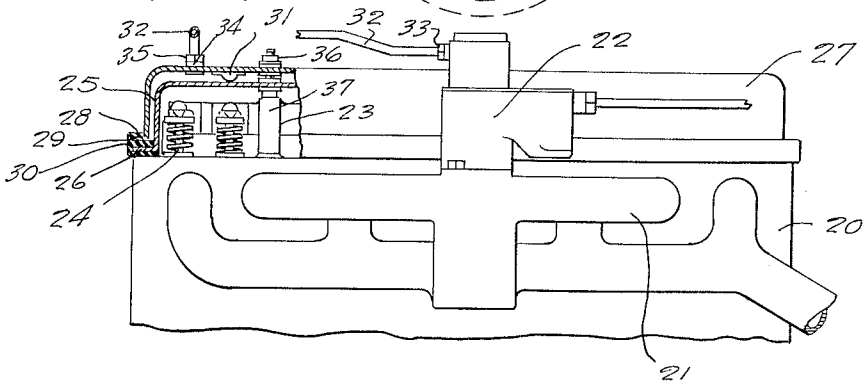
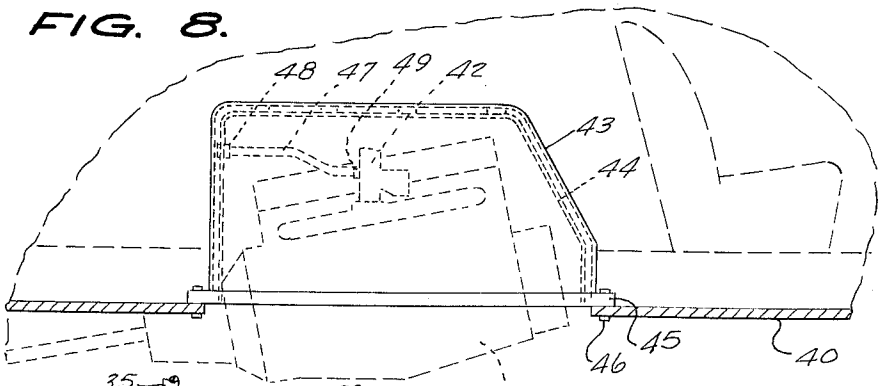


FIG. 8.



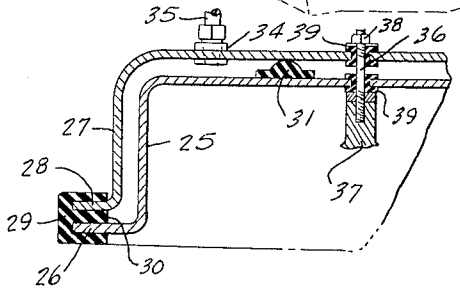


FIG. 7.

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ENGINE VACUUM SOUND BARRIER

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4 Claims. (Cl. 181—33)

The present invention is related to sound insulators and is more particularly concerned with providing a sound deadening enclosure for devices having mechanically produced sounds.

The principal object of the present invention is to provide an enclosure for retaining sounds therein emitting from a device within said enclosure and which enclosure can be of any desired configuration.

A further important object of the invention is to provide a sound proofing cover for devices producing mechanically originated sounds such as those sounds coming from an engine or elements thereof and which cover can at the same time serve in other capacities, as for example, protectors, oil, fuel, or fume retainers, or as parts of the engines.

Another and important object of the invention is to provide a sound retaining closure which can be quickly and easily assembled and disassembled and which closure can be formed principally by metallic components which are prevented from contacting one another at any time.

Further objects of the invention will be in part obvious and in part pointed out in the following description of the accompanying drawing in which,

FIG. 1 is a top plan view of an outboard marine engine including a closure according to the invention.

FIG. 2 is a front view of said marine engine.

FIG. 3 is a side elevation of said marine engine with a portion of the cover broken away.

FIG. 4 is an enlarged detailed partial cross-sectional view of the front end of the engine closure taken on line 4—4 of FIG. 2.

FIG. 5 is a top view of an over-head valve internal combustion engine including a valve cover according to the invention.

FIG. 6 is a side elevation of the upper portion of said over-head valve internal combustion engine with a portion of the valve cover broken away.

FIG. 7 is an enlarged view of the end portion of said valve cover shown in section in FIG. 6, and

FIG. 8 is a longitudinal sectional view of a boat engine cover as mounted in an interior portion of the boat.

Referring now more particularly to the accompanying drawings wherein like and corresponding parts are designated by similar reference characters, numeral 1 designates the drive shaft housing of an outboard marine engine, while 2 indicates the internal combustion engine forming the driving element of the entire device. A base 3 of the U-shape cross-sectional configuration is fixedly mounted on said housing around the lower portion of the engine 2 and has sides 4 extending upwardly along said engine.

In configuration with said base 3 and sides 4 a sound proofed enclosure is provided by a metallic or plastic cover 5 whose marginal edge is bent laterally providing a flange 6 around the lower edge of said cover. An inner cover 7 also of a metallic or plastic material is similar to outer cover 5 with both having a U-shaped cross-sectional configuration but inner cover 7 is slightly smaller being inserted within but spaced from outer cover 5. Inner cover 7 likewise has its marginal edge bent laterally forming flange 8 positioned upon the top of base sides 4 beneath flange 6. A resilient or semi-rigid gasket 9 of an E-shaped cross-sectional configuration is positioned above

and below and between flanges 6 and 8 spacing the same apart. Inner cover 7 and outer cover 5 have resilient or semi-rigid spacers 10 mounted upon their opposing faces so that the covers cannot contact one another at any point.

Inner cover 7 has an opening 11 through which extends a tubular connector 12 which connector closes off said opening and is connected to cover 7. A hose or tube 13 is fixedly connected at one end to connector 12 and is of a material which will not collapse when a vacuum is produced within the base thereof. The opposite end of said hose or tube 13 is joined to a connector 14, which in turn is connected to the intake manifold 15 of engine 2 placing the space between covers 5 and 7 in communication with the interior of said intake manifold for having a vacuum produced therein when engine 2 is operating.

A series of resilient U-shaped clips 16 each have gasket 9 with flanges 6 and 8, inserted therein for retaining the same together by means of the spring-like action of said clips.

Covers 5 and 7 are of a configuration for encasing engine 2 and when said engine is operating the vacuum between said covers prevents the sound waves produced by said engine from passing through said covers.

In FIGS. 5, 6 and 7 there is disclosed a modified form of the present invention, namely, a valve cover for an over-head valve internal combustion engine 20 which has an intake manifold 21 and carburetor 22. The over-head valves are carried on a shaft 23 supporting valve stems 24. An inner cover 25 of metal or plastic having a U-shaped cross-sectional configuration encloses all of said valve stems and shaft 23 and has a lateral flange 26 formed by bending the marginal edge of said cover at right angles thereto.

A gasket 29 of resilient or semi-rigid heat resistant material having an E-shaped cross-sectional configuration, is mounted upon the head of engine 20 and has flanges 26 and 28 inserted therein spacing said flanges apart and from said engine while sealing off the space between said covers.

A plurality of spacers 31 of resilient or semi-rigid material are positioned throughout the area between said covers to prevent said covers from contacting one another.

A tube or hose 32 is joined by a connector 33 to the intake of carburetor 22 while a connector 34 mounted on and extending through cover 27 connects the opposite end 35 of said hose to said cover placing the interior of said cover in communication with said carburetor intake for having a vacuum produced therein when said engine is operating. A plurality of bolts 36 extend from valve shaft support 37 through covers 25 and 27 with nuts 38 mounted thereon for retaining said covers. Resilient or semi-rigid members 39 are mounted on said bolts for preventing said covers from contacting the bolts. When engine 20 is operating a suction is created in carburetor 22 drawing air therein, and, therefore, all air from the space between covers 25 and 27 is also drawn through tube 32 providing a vacuum between said covers. Said vacuum prevents the passage of sound waves from said valves passing therethrough eliminating the noise generally emitting from over-head valves of this type.

In FIG. 8 there is shown a further adaptation of the present invention as applied in a boat of which only the flooring 40 is shown while the engine 41 of said boat is indicated in dotted lines.

Said engine has a carburetor 42 for feeding the fuel to said engine.

A cover 43 for said engine has an interior space 44 throughout the entire length and width thereof with said cover being fixedly mounted upon a base 45 sealing off space 44. Said base is mounted upon floor 40 being re-

tained by bolts 46 and is of a configuration for permitting engine 41 to extend therethrough and encased by cover 44.

A hose or tube 47 is connected at one end to a connector 48 mounted on cover 43 and communicating with space 44 while a further connector 49 joins said hose to and in communication with the intake of carburetor 42.

Thus floor 40, base 45 and cover 43 completely enclose engine 41 to the area above said floor. When said engine is running the draft of carburetor 42 creates a vacuum in space 44 which vacuum prevents sounds emitting from engine 41 from passing therethrough.

It is to be appreciated that the present sound-proofing enclosures can be readily modified for application with other types of devices to be enclosed and for which it is desired to prevent sounds originating therefrom from being heard outside of the enclosures. Further, other means than engine intake manifolds can be employed for providing the vacuum within the covers such as vacuum pumps driven by an engine or electric motor.

Accordingly, the present invention is capable of considerable modification and such changes thereto as come within the scope of the appended claims is deemed to be a part of the invention.

I claim:

1. A sound retaining enclosure for internal combustion engines comprising in combination an engine, means for producing a vacuum, a pair of similar cover members detachably positioned over said engine, one of said members being positioned over the second of said members, resilient means spacing said members apart and sealing off the space therebetween, said second member having an opening therethrough, a tubular hose connector mounted on said second member closing said opening, and a hose connected to said connector and to said means for producing a vacuum for providing a vacuum in said sealed space for preventing the passage of sound waves through said cover members.

2. A sound retaining enclosure for outboard marine engines comprising in combination an outboard motor having an internal combustion engine with intake manifold and drive shaft housing extending from said engine, a closure base mounted on said drive shaft housing extending laterally thereof, a pair of superimposed spaced cover members for said engine having flanged edges, a resilient gasket having an E-shaped cross-sectional configuration having fingers extending between said flanged edges spacing the same apart and closing the space between said members, means detachably connecting said flanges to said closure base enclosing said engine, and means connected to one of said cover members and in communication with the space between said cover members and said intake manifold of said engine for producing a vacuum in the space between said members when said engine is operating.

3. A sound proofing valve cover comprising in combination an over-head valve internal combustion engine having an intake manifold, a cover member enclosing said over-head valves of said internal combustion engine, said cover member having a lateral flange therearound with openings therethrough, a second cover member similar to said first mentioned cover member but being slightly larger with said first member extending therein, said second member having a lateral flange with openings positioned above said first member flange, a resilient seal strip having an E-shaped cross-sectional configuration enclosing said flanges and having fingers extending therebetween spacing said members, means detachably retaining said members on the head of said engine, and means connected to said second member placing the space between said members in communication with the intake manifold of said engine for providing a vacuum in the space between said members.

4. A sound proofing cover for boat inboard engines comprising in combination an engine carried by the boat and having an intake manifold, a base plate capable of being connected to said boat with said engine extending therethrough, a housing for the boat engine having a closed area provided therein throughout the entire housing, said housing being mounted on said base plate, and means connecting said housing closed area to the intake manifold of said boat engine for producing a vacuum in said area when said engine is running.

References Cited in the file of this patent

UNITED STATES PATENTS

1,459,797	Parolini et al.	June 26, 1923
1,922,200	Frank	Aug. 15, 1933
1,984,007	Babbitt	Dec. 11, 1934
2,011,988	Timian	Aug. 20, 1935
2,076,224	Chilton	Apr. 6, 1937
2,123,358	Grutzner	July 12, 1938
2,756,736	Kiekhaefer	July 31, 1956
2,798,470	Kiekhaefer	July 9, 1957
2,890,674	Rose	June 16, 1959
2,934,801	Blaszkowski	May 3, 1960

FOREIGN PATENTS

219,481	Switzerland	May 16, 1942
567,567	Great Britain	Feb. 20, 1945
643,181	Great Britain	Sept. 15, 1950