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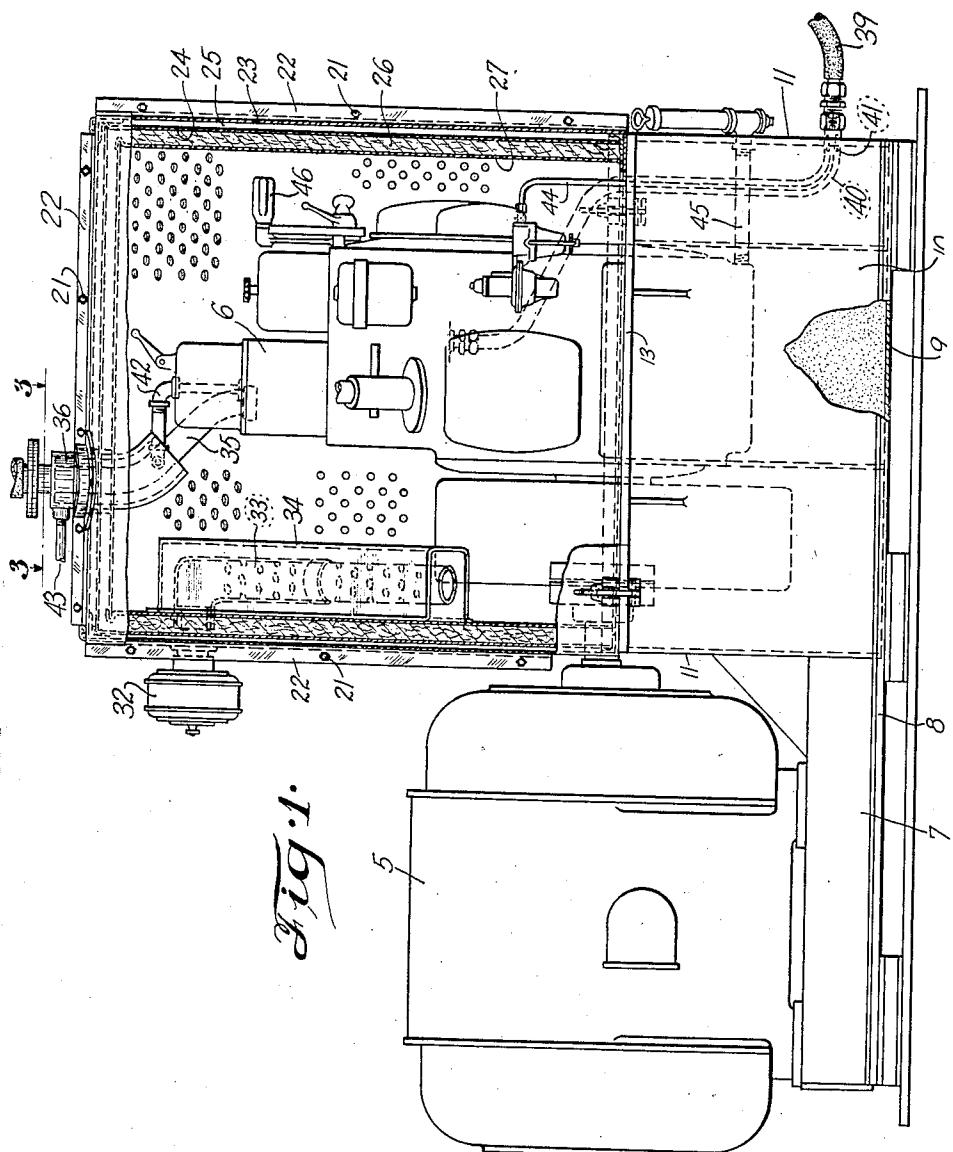
F. P. GRUTZNER

2,123,358

ENGINE SILENCING HOOD

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2 Sheets-Sheet 1



INVENTOR
FRITZ P. GRUTZNER
By *Pave L. Kishner*
ATTORNEY

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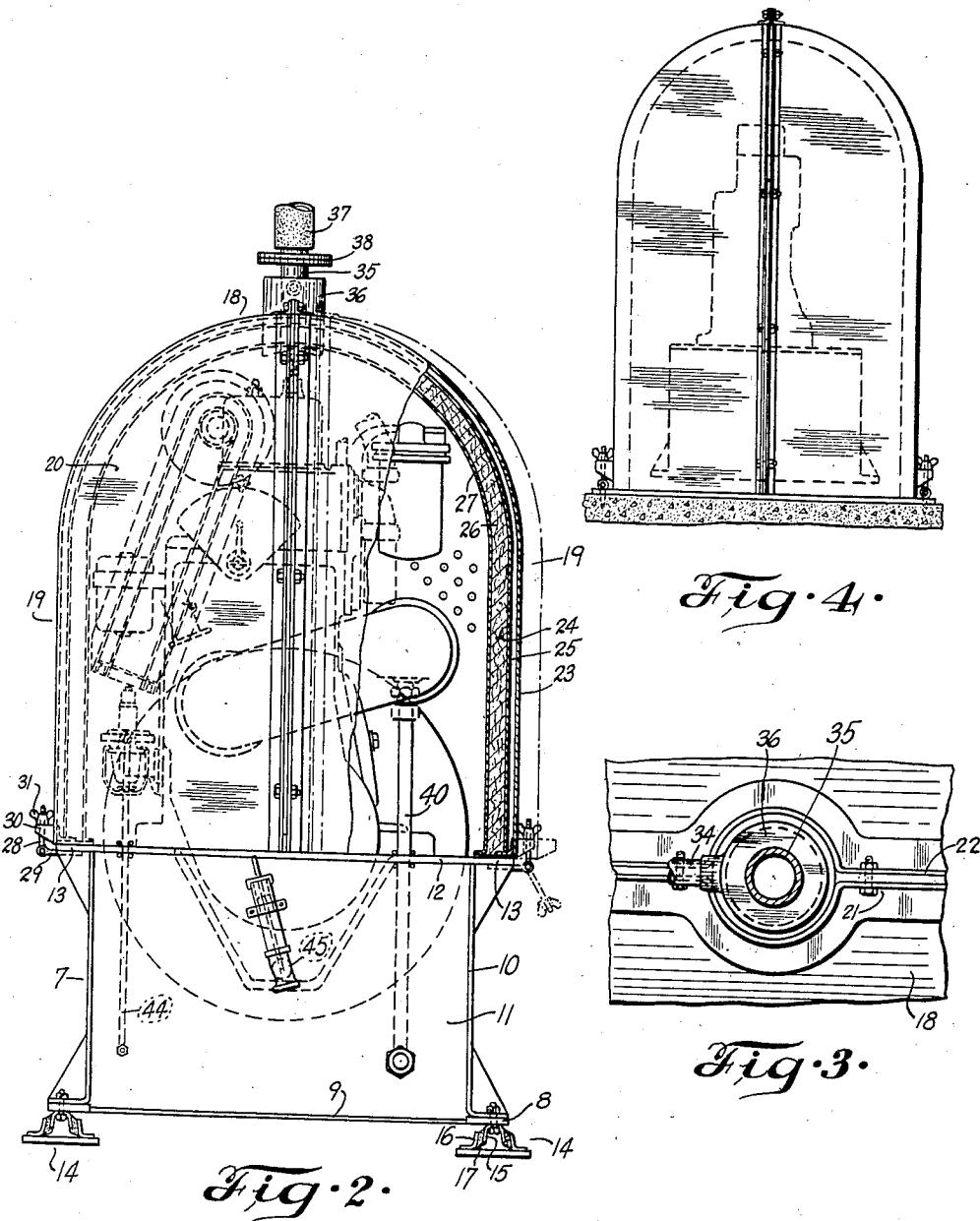
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UNITED STATES PATENT OFFICE

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ENGINE SILENCING HOOD

Fritz Paul Grutzner, Beloit, Wis., assignor to
Fairbanks, Morse & Co., Chicago, Ill., a cor-
poration of Illinois

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5 Claims. (Cl. 123—198)

This invention relates to means for suppressing noise attending the operation of internal combustion engines, and more particularly to an improved silencing hood for internal combustion engines, especially useful for Diesel-generator installations in residences, stores, theatres, and the like.

An object of the invention is to provide an improved silencing hood of the character described which is adapted to fit closely about the driving member of a Diesel-generator unit to completely house the same, and which is so constructed and mounted as to be readily removed and replaced for purposes of engine inspection or repair.

10 Other objects and advantages will appear from the following detailed description and drawings accompanying the same, setting forth preferred embodiments of the invention as applied to a Diesel-generator unit.

15 In the drawings, Fig. 1 is a side elevational view of such unit and silencing hood, with portions broken away to illustrate the preferred construction; Fig. 2 is an end elevation of the assembly illustrated in Fig. 1 with a portion of the silencing hood broken away; Fig. 3 is a sectional view taken at line 3—3 of Fig. 1, and Fig. 4 is an end elevation of an engine assembly and silencing hood therefor of alternate design.

20 Referring now by characters of reference to the drawings, a Diesel-electric generating unit to which the silencing hood of the present invention is especially applicable includes an electric generator 5 operatively connected by a suitable coupling to the crank shaft of the engine, designated 6. The engine and generator are mounted on a unitary sub-base 7 having anchoring flanges 8 at the lower side edges thereof. That portion of the sub-base which underlies and supports the engine is substantially of box-like construction, 25 having a bottom wall 9, side walls 10, and end walls 11. A top plate 12, surmounting side and end walls 10 and 11, has suitable openings therein to accommodate the engine flywheel, oil-pan and other portions of the engine which extend below the crank shaft. Side margins of the top plate 12 project outwardly beyond the side walls 10 of the sub-base, providing horizontal flanges 13 for receiving and supporting the silencing hood. For purposes of damping vibration and minimizing 30 the drum effect of the box-like sub-base, the same may be partly filled with sand or gravel.

35 The sub-base is preferably anchored to a concrete foundation or other solid footing, which may constitute the flooring of the room in which the unit is installed, by means of suitably spaced

sound- and vibration-damping mountings 14. Such mountings desirably comprise a bracket 15 fastened to the sub-base, a companion bracket 16 embedded or otherwise fixed to the foundation, and rubber blocks 17 which interconnect vertical arms of brackets 15 and 16.

40 The silencing hood is designed and constructed to fit over and enclose completely that part of the engine structure which rises above the sub-base. The hood embodies a rounded top portion 18 which merges into vertical side walls 19 that terminate downwardly at the supporting flanges 13, and end walls 20 that are substantially co-planar with the sub-base end walls 11. The hood is divided longitudinally into two complementary sections at a vertical, medial plane, the sections being detachably secured together by threaded elements 21 which engage flanges 22 disposed at the mating margins of the paired sections.

45 Each hood section preferably includes an outer casing member 23 of sheet metal, and a shell 24 spaced inwardly of the casing 23, the casing and shell defining an air chamber 25 therebetween. At the inner surface of shell 24 is a layer 26 of sound-absorbing material such as felt or asbestos fibre, confined between shell 24 and a foraminous or reticulate inner lining member 27.

50 Detachable securement of the hood to the sub-base structure is preferably accomplished by means of bolts 28 pivoted on arms 29 which extend laterally from flanges 13, the bolts being adapted to be swung into bifurcated, laterally projecting lugs 30 on the hood, wing-nuts 31 on bolts 28 serving to clamp the hood to the sub-base. The broken line showing in Fig. 2 illustrates one of the hood sections as detached and displaced from its mating section.

55 Combustion air is drawn into the engine chamber through a filter silencer 32, of conventional type, mounted on one end of an intake pipe 33 which extends through an end wall of the hood.

That portion of the intake pipe which is disposed internally of the hood extends substantially parallel to the end wall and is provided with a multiplicity of perforations. An open-ended sound-absorbing casing 34 carried by the hood surrounds the perforated portion of the air intake pipe. The assembly thus described provides an effective muffler which checks sound transmission through the air intake opening in the hood.

60 Exhaust gases are discharged through a pipe 35 which projects through an opening at the juncture of the upper edges of the casing sections, such opening being formed by complementary, semi-circular recesses in the casing

sections. It is desirable to protect the sound-absorbing material 26 from heat from the exhaust pipe 35, and accordingly the latter is provided with a water jacket 36 supplied with cooling fluid which also serves to cool the engine. The hood sections are adapted to fit snugly around the jacket 36 as best appears from Fig. 3. Flexible exhaust tubing, a portion of which is indicated at 37, Fig. 2, connects with pipe 35 by means of a flanged union 38, serving to conduct gases to the desired point of discharge. By the provision of flexible exhaust tubing, the transmission of engine vibration and sound through this connection is avoided.

15 Cooling water is conducted through flexible tubing 39, Fig. 1, and a water pipe 40 which extends through openings in the engine sub-base. Metal to metal contact between pipe 40 and the engine supporting structure is prevented by rubber sleeves 20 41 which line the openings in the sub-base through which the water pipe extends. A conduit 42 connects the engine water jacket with the exhaust pipe water jacket 36, the cooling water being discharged from the assembly through pipe 43.

25 Connections for fuel and lubricating oil are made through the sub-base, rubber silencing sleeves being provided at the conduit openings for the fuel and oil pipes 44 and 45 respectively. The engine starting and speed controls 46 in the present 30 illustration shown as being inside the hood, may be extended through suitable openings in the hood for external manipulation, in which event the opening in the hood for the control member should be provided with a rubber silencing sleeve.

35 An alternative construction of the silencing hood illustrated in Fig. 4 shows the hood extending to the floor or foundation, and being spaced on all sides from the engine. The hood is split centrally, and is similar in general construction 40 to the hood illustrated in Figs. 1 and 2. However when this hood assembly is employed, flexible conduit for water, oil exhaust gases and fuel should extend between the engine and hood to permit the engine to oscillate on its resilient mounting relatively to the fixed hood, and to prevent transmission 45 of sound and vibration to the hood.

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

1. A silencing hood for stationary internal combustion engines comprising a perforated inner casing member, an imperforate outer casing member paralleling said inner member, an intermediate shell spaced between said inner casing mem-

ber and shell, and sound-absorbing material filling the space between the inner casing member and shell, said hood being divided at a vertical, longitudinal medial plane into paired, complementary sections, and means detachably securing 5 said sections together.

2. In combination with an internal combustion engine, a base structure supporting the engine, a silencing hood enclosing the engine and carried by said base structure, said hood comprising top, side and end walls and being divided into complementary sections at a vertical, longitudinal, medial plane, means detachably securing said hood sections together, and means detachably securing the hood to said base structure. 10

15 3. An engine-enclosing and sound-proofing structure including a base portion, horizontally projecting flanges at the bottom of the base portion for securement thereof to a floor or like subjacent support, a plurality of horizontal projecting 20 flanges carried by the upper wall portions of the base and attached directly to support the engine, an upper housing portion formed of a plurality of detachably connected sections and characterized by spaced wall elements, a layer of fibrous sound-proofing material between a pair of said wall elements, a plurality of ports or openings in said upper enclosure and adapted to receive air and exhaust piping for the engine, and means for detachably securing the upper enclosure to said base 25 structure. 30

4. In an engine-enclosing and sound-proofing structure, a hood formed of connected sections and adapted to be disposed about the upper portion of the engine, said hood being provided with openings to accommodate the engine air- and exhaust-piping, and a hollow element in one of said openings providing a water jacket and adapted for connection to the engine cooling system, said element adapted to enclose an engine exhaust conduit and tending thermally to insulate said conduit from the hood structure. 35

40 5. In an engine-enclosing and sound-proofing structure, a hollow structure formed of detachably connected sections and a layer of fibrous insulating material carried by the walls of the hood structure, said structure being provided, between a pair of its connected sections, with an opening to pass the exhaust line from the engine, and an annular water jacket member adapted for connection to the engine cooling system, and disposed in said opening about the exhaust pipe. 45

FRITZ PAUL GRUTZNER.