Dec. 2, 1952 J. O. P. HUGHES 2,619,918

GAS TURBINE LOCOMOTIVE

Filed Jan. 28, 1949 3 Sheets-Sheet 1

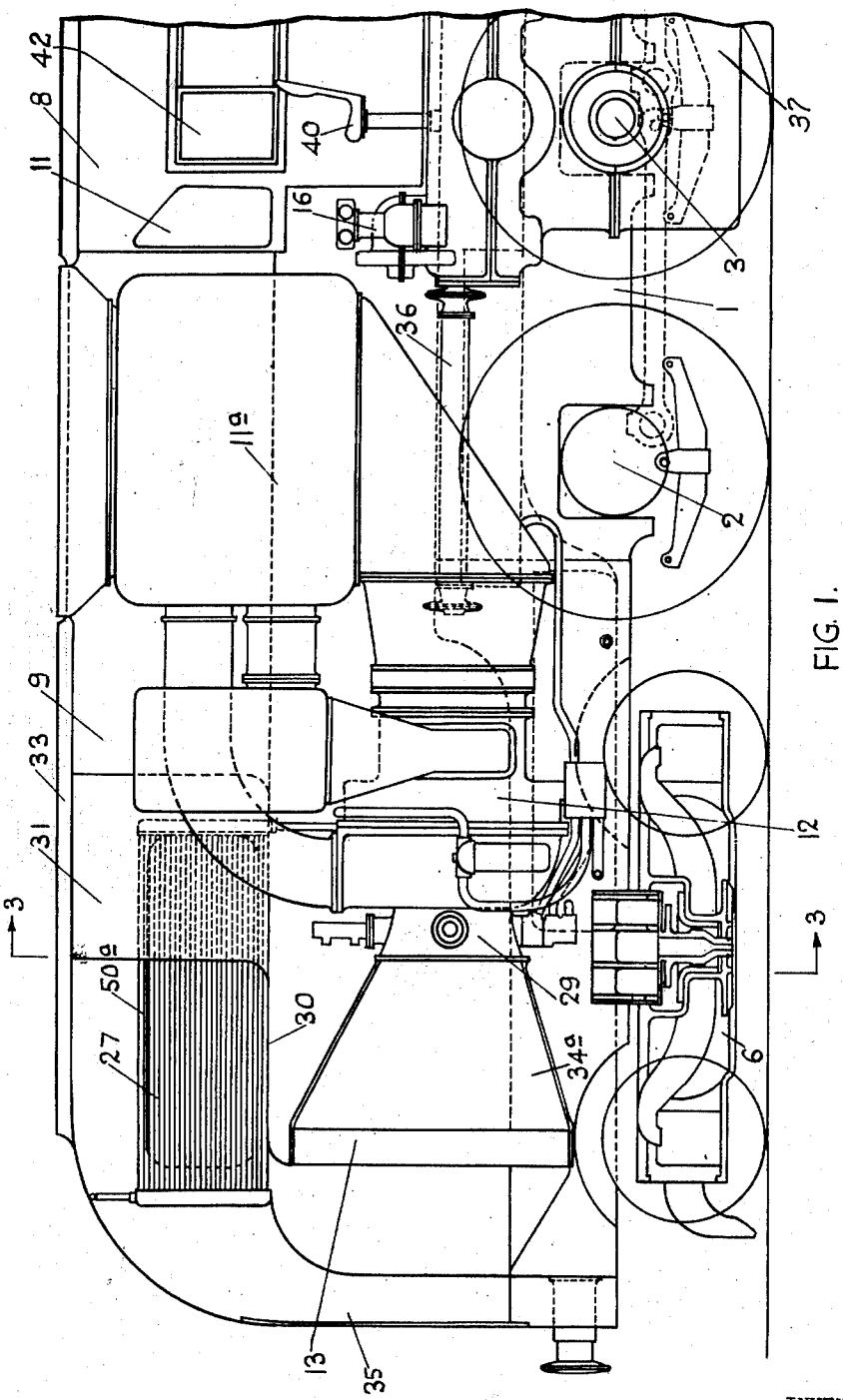


FIG. 1.

INVENTOR:
JOHN O. P. HUGHES

BY Babcock & Babcock
ATTORNEYS

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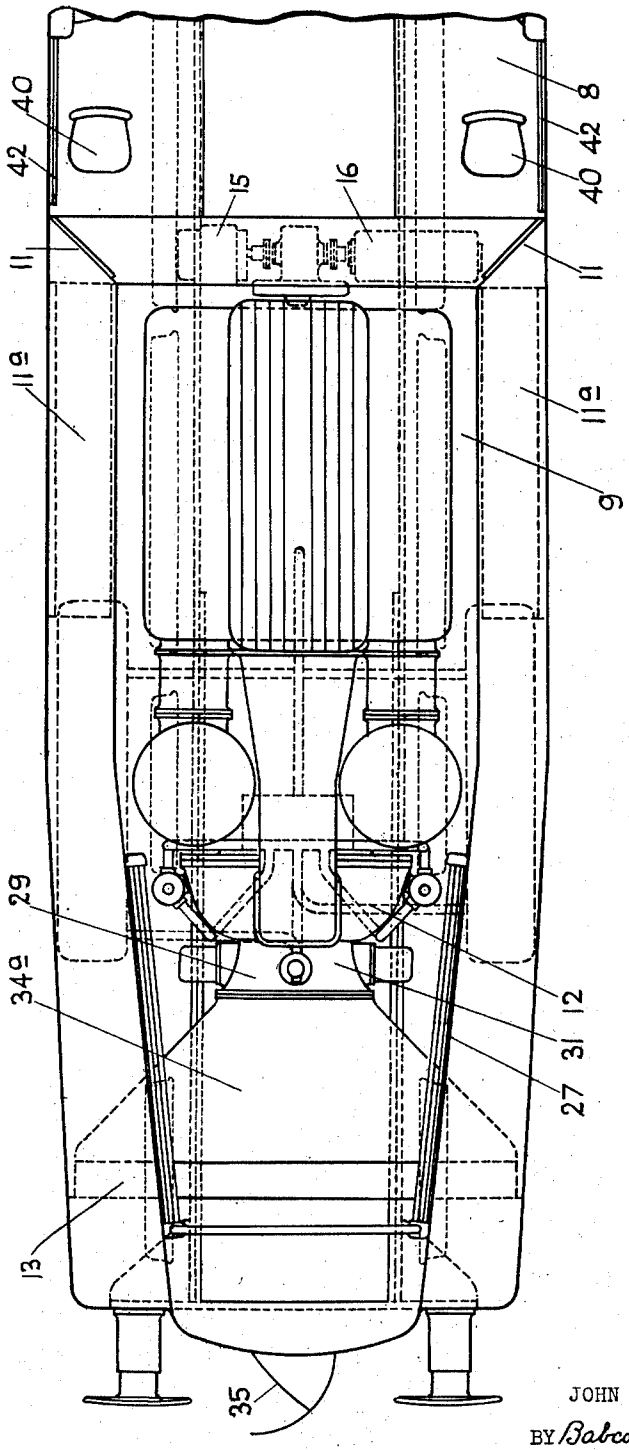


FIG. 2.

INVENTOR:
JOHN O.P. HUGHES
BY Babcock & Babcock
ATTORNEYS

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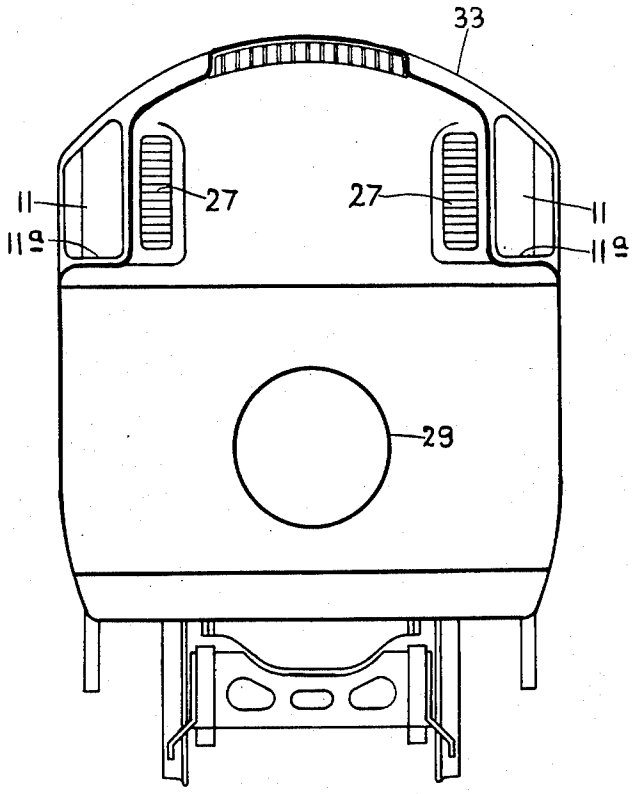


FIG. 3.

Inventor
John O. P. Hughes
By Babcock & Babcock
Attorneys

Patented Dec. 2, 1952

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UNITED STATES PATENT OFFICE

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GAS TURBINE LOCOMOTIVE

John Oliver Philip Hughes, Rugby, England, assignor to The English Electric Company Limited, London, England, a British company

Application January 28, 1949, Serial No. 73,257
In Great Britain February 3, 1948

1 Claim. (Cl. 105—62)

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The invention relates to a gas turbine locomotive and is concerned with the disposition of the air intake to the gas turbine compressor on the locomotive, and has the main object of providing such a disposition which prevents or substantially reduces the sucking in of foreign matter into said air intake when the locomotive passes line side structures, over-bridges or tunnel walls close to the load gauge profile which might harbour loose dirt.

According to the invention the gas turbine has a compartment, lateral walls with air intake openings arranged longitudinally thereon laterally delimiting the said compartment, the cross section of the said compartment over the length of the said air intake openings having a wide portion conforming substantially to the loading gauge, and a narrow portion of a width substantially smaller than that of the loading gauge, the said air intake openings being arranged on the said narrow portion of the said lateral walls whereby the sucking-in of foreign matter from objects close to the loading gauge into the said air intake openings is avoided.

In order that the invention be better understood and readily carried into effect, an embodiment of a gas turbine locomotive according to the invention will now be described by way of example with reference to the accompanying drawings from which further features of the invention will also become clear:

Fig. 1 is the half of a 4–8–4 locomotive in elevation, partly in section which in the normal direction of running is the front half.

Fig. 2 is a plan view corresponding to Fig. 1 with the roof omitted for clarity.

Fig. 3 is a cross section through the locomotive along the line 3—3 of Fig. 1.

The locomotive comprises a main frame 1 which carries four coupled axles forming the coupled wheel base of the locomotive, and two bogies on the front and rear end of the locomotive, respectively, of which the two front axles 2, 3 and the front bogie 6 only are shown.

The superstructure of the locomotive comprises in the centre the driver's cab 8 extending in width and height the full size of the loading gauge, and a compartment 9 of equal height but of restricted width upward from a level below the end windows of the cab at the front end of the locomotive. A similar compartment of restricted width (not shown) may be arranged at the rear end of the locomotive.

The ledges 11*a* formed along the end compartment 9 are no wider than is necessary to give

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clear forward vision from the cab, and can be narrower than the space which would be required for a corridor. The gas turbine set 12 and the air filter 13, the generator 15, vacuum brake exhauster and/or air compressor 16 occupy the nose compartment 9.

There are seats 40, and driving controls are arranged near each of the front windows 11. Moreover there are side windows 42 in the driver's cab.

The gas turbine set 12 drives by means of a flexible shaft 36 a gear box 37 from which the axle 3 of the coupled wheelbase of the locomotive is driven.

An important feature of the invention is the design and disposition of the main air intake and filtration of the air on its way to the compressor. The air intakes are large openings 27 each side of the locomotive, situated at the end immediately adjacent to the gas turbine set 12 and in that portion 9 of the locomotive body side which is not built to the full width of the loading gauge. By this design the air intake is removed from proximity to the walls of tunnels, overbridges and lineside structures which might harbour loose dirt. A grille is fastened over the openings 27 to exclude the entry of large objects. The grille can also be heated for de-icing purposes when climatic conditions demand it, for example by having a proportion of the hot exhaust gas passed from a branch of the gas turbine exhaust elbow through a heating coil 50*a* which may constitute the bars of the grille. The air filter 13 consists of the bank of filter elements arranged right across the width of the locomotive and extending in height up to the ledge 11*a*, i. e. the level above which the locomotive body structure is reduced in width. The filter is divided from the air intake by a horizontal partition 30 which extends from the top of the filter to the back of the air intake; at this point it is joined by a vertical partition 31 V-shaped in plan which extends to the roof 33 of the locomotive.

The area of the filter 13 has to be large in order to keep the air velocity low, and the rear of the filter 13 is connected with the much smaller air intake 29 of the compressor by the converging chamber 34*a*. The object of this arrangement is to secure as even a distribution as possible of the air over the surface of the filter. An advantage of this design is the accessibility of the air intake filters for cleaning in position, a door 35 being provided in the front of the locomotive giving access to the dust laden front of the filter. Since the filter is composed of small elements they can

alternatively be readily removed for renewal or cleaning.

What I claim as my invention and desire to secure by Letters Patent is:

A gas turbine locomotive having a compartment, lateral walls with air intake openings arranged longitudinally thereon laterally delimiting the said compartment, the cross section of the said compartment over the length of the said air intake openings having a wide portion conforming substantially to the loading gauge, and a narrow portion of a width substantially smaller than that of the loading gauge, the said air intake openings being arranged on the said narrow portion of the said lateral walls whereby the sucking-in of foreign matter from objects close to the loading gauge into the said air intake openings is avoided.

JOHN OLIVER PHILIP HUGHES.

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