CLAIMS

1.- A method of converting steam turbine-powered LNG carriers, particularly of the type used for transporting liquefied natural gas, the method changing propulsion by means of adding one or several electric power generator sets (47) powering one or several electric propulsion engines (30, 31) transmitting power by means of a mechanical connection with the gearbox (25), maintaining the steam turbine propulsion plant, such that the converted carrier further has diesel electric propulsion and hybrid propulsion combining the preceding two,

characterized in that the mechanical power of the electric propulsion engines (30, 31) is injected directly in the existing gearbox (25) by means of a first phase of modifying the stern end pieces of the hollow shaft with another internal shaft (13) of the low pressure side and of the hollow shaft with another internal shaft (14) of the high pressure side, referred to as quill shaft, of the existing gearbox (25) by means of modifying or replacing the conical coupling (9) on the low pressure side and the other conical coupling (10) on the high pressure side with modified conical couplings (26, 27), to continue with a phase of connecting the respective electric propulsion engines (30, 31) by means of flexible couplings and/or clutches (28, 29) connected to the modified conical couplings (26, 27) previously installed in the gearbox (25), locating the electric propulsion engines (30, 31) astern the gearbox (25).

2.- A method of converting steam turbine-powered LNG carriers, particularly of the type used for transporting liquefied natural gas, the method changing propulsion by means of adding one or several electric power generator sets (47) powering one or several electric propulsion engines (30, 31) transmitting power by means of a mechanical connection with the gearbox (25), maintaining the steam turbine propulsion plant, such that the converted carrier further has diesel electric propulsion and hybrid propulsion combining the preceding two,

characterized in that the mechanical power of the electric propulsion engines (30, 31) is injected in the existing gearbox (25) by means of a first phase of modifying or replacing the stern end pieces of the hollow shaft with another internal shaft (13) of the low pressure side and of the hollow shaft with another internal shaft (14) of the high pressure side, referred to as quill shaft, of the existing gearbox (25) by means of modifying or replacing the conical coupling (9) on the low pressure side and the other conical coupling (10) on the high pressure side, to continue with a phase of connecting the respective electric propulsion engines (30, 31) to additional gearboxes (32, 33), optionally provided with respective hydraulic clutches (36, 37), and connected to the existing gearbox (25) by means of flexible couplings and/or clutches (28, 29) through the modified conical couplings (26, 27) previously formed in the gearbox (25), the electric propulsion engines (30, 31) being connected to the additional gearboxes (32, 33) by means of additional flexible couplings (34, 35), locating the electric propulsion engines (30, 31) towards the bow or astern.

3.- The method of converting steam turbine-powered LNG carriers according to claim 1 or 2, characterized in that it comprises adding auxiliary components of the electric power generators (47) selected from the group consisting of: high voltage switchboards (48), transformers (49), converters (50), additional low voltage switchboards (51), natural gas compressors (52), natural gas heat exchangers (53), pumps (54), purifiers (55), auxiliary heat exchangers of the electric power generators (56) and exhaust gas boilers (57).

4.- The method of converting steam turbine-powered LNG carriers according to the preceding claim, characterized in that both the electric power generators (47) and a substantial part of their auxiliary components (48, 49, 50, 51, 54, 55, 56, 57) are installed distributed in several prefabricated modules located on the main deck close or adjacent to the house of the engine room casing, with the exception of the natural gas

compressors and heat exchangers (52, 53) which will be installed in the compressor house existing in all LNG carriers in a new module adjacent to or in the proximities of said house.

5.- The method of converting steam turbine-powered LNG carriers according to any of the preceding claims, characterized in that the electric power generators (47) are dual-fuel diesel generators, giving rise to a diesel-electric propulsion combined with the existing steam turbine (2, 3) propulsion of the gas turbine type, giving rise to a turbo-electric propulsion combined with the existing steam turbine (2, 3) propulsion, or a diesel and gas turbine combination, giving rise to a composite diesel-turbo-electric propulsion combined with the existing steam turbine (2, 3) propulsion.

CLAIMS

1.- A method of converting steam turbine-powered LNG carriers, particularly of the type used for transporting liquefied natural gas, the method changing propulsion by means of adding one or several electric power generator sets (47) powering through switchboards (48) and converters (50) one or several electric propulsion engines (30, 31) transmitting power by means of a mechanical connection with the gearbox (25), maintaining the steam turbine propulsion plant, such that the converted carrier further has diesel electric propulsion and hybrid propulsion combining the preceding two,

characterized in that the mechanical power of the electric propulsion engines (30, 31) is injected directly in the existing gearbox (25) by means of a first phase of modifying the stern end pieces of the hollow shaft with another internal shaft (13) of the low pressure side and of the hollow shaft with another internal shaft (14) of the high pressure side, referred to as quill shaft, of the existing gearbox (25) by means of modifying or replacing the conical coupling (9) on the low pressure side and the other conical coupling (10) on the high pressure side with modified conical couplings (26, 27), to continue with a phase of connecting the respective electric propulsion engines (30, 31) by means of flexible couplings and/or clutches (28, 29) connected to the modified conical couplings (26, 27) previously installed in the gearbox (25), locating the electric propulsion engines (30, 31) astern the gearbox (25).

2.- A method of converting steam turbine-powered LNG carriers, particularly of the type used for transporting liquefied natural gas, the method changing propulsion by means of adding one or several electric power generator sets (47) powering through switchboards (48) and converters (50) one or several electric propulsion engines (30, 31) transmitting power by means of a mechanical connection with the gearbox (25), maintaining the steam turbine propulsion plant, such that the

converted carrier further has diesel electric propulsion and hybrid propulsion combining the preceding two,

characterized in that the mechanical power of the electric propulsion engines (30, 31) is injected in the existing gearbox (25) by means of a first phase of modifying or replacing the stern end pieces of the hollow shaft with another internal shaft (13) of the low pressure side and of the hollow shaft with another internal shaft (14) of the high pressure side, referred to as quill shaft, of the existing gearbox (25) by means of modifying or replacing the conical coupling (9) on the low pressure side and the other conical coupling (10) on the high pressure side, to continue with a phase of connecting the respective electric propulsion engines (30, 31) to additional gearboxes (32, 33), optionally provided with respective hydraulic clutches (36, 37), and connected to the existing gearbox (25) by means of flexible couplings and/or clutches (28, 29) through the modified conical couplings (26, 27) previously formed in the gearbox (25), the electric propulsion engines (30, 31) being connected to the additional gearboxes (32, 33) by means of additional flexible couplings (34, 35), locating the electric propulsion engines (30, 31) towards the bow or astern.

3.- The method of converting steam turbine-powered LNG carriers according to claim 1 or 2, characterized in that it comprises adding auxiliary components of the electric power generators (47) selected from the group consisting of: high voltage switchboards (48), transformers (49), converters (50), additional low voltage switchboards (51), natural gas compressors (52), natural gas heat exchangers (53), pumps (54), purifiers (55), auxiliary heat exchangers of the electric power generators (56) and exhaust gas boilers (57).

4.- The method of converting steam turbine-powered LNG carriers according to the preceding claim, characterized in that both the electric power generators (47) and a substantial part of their auxiliary components (48, 49, 50, 51, 54, 55, 56, 57) are installed distributed in several prefabricated modules

located on the main deck close or adjacent to the house of the engine room casing, with the exception of the natural gas compressors and heat exchangers (52, 53) which will be installed in the compressor house existing in all LNG carriers in a new module adjacent to or in the proximities of said house.

5.- The method of converting steam turbine-powered LNG carriers according to any of the preceding claims, characterized in that the electric power generators (47) are dual-fuel diesel generators, giving rise to a diesel-electric propulsion combined with the existing steam turbine (2, 3) propulsion of the gas turbine type, giving rise to a turbo-electric propulsion combined with the existing steam turbine (2, 3) propulsion, or a diesel and gas turbine combination, giving rise to a composite diesel-turbo-electric propulsion combined with the existing steam turbine (2, 3) propulsion.