

No. 840,255.

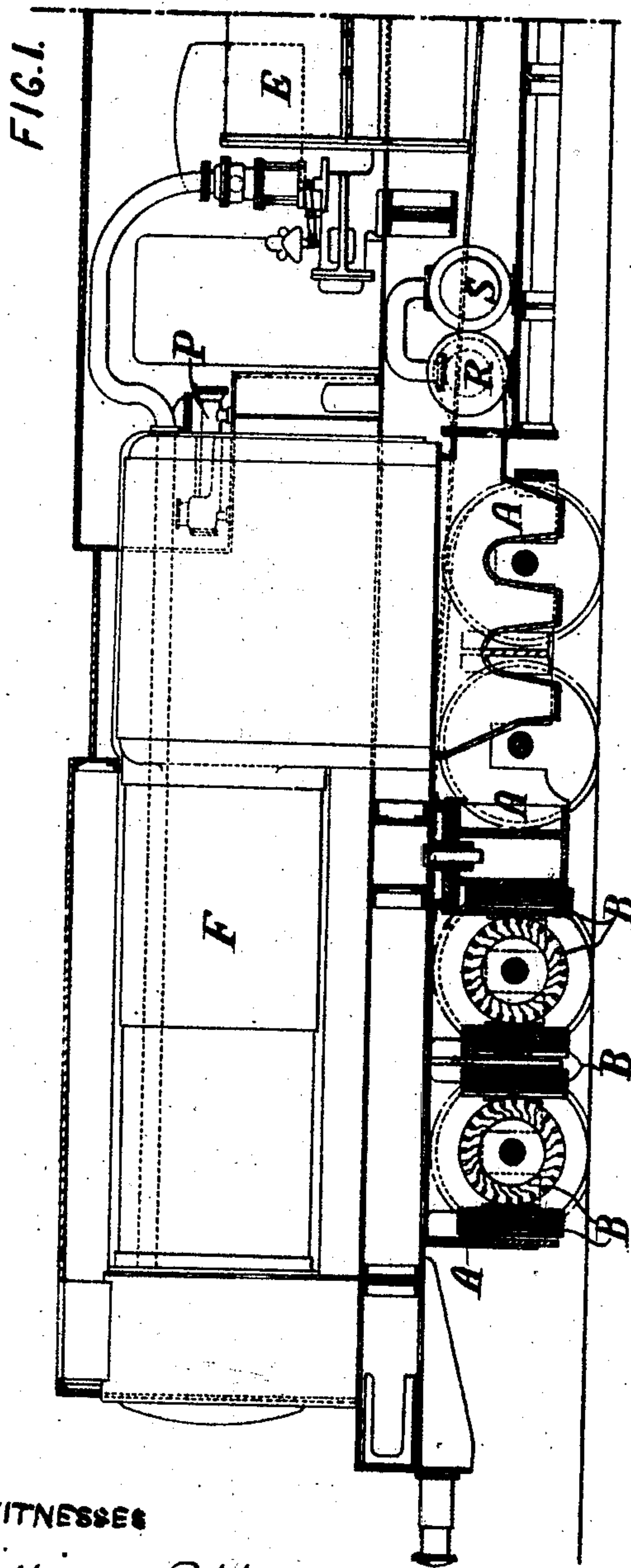
PATENTED JAN. 1, 1907.

H. REID & D. McN. RAMSAY.

LOCOMOTIVE.

APPLICATION FILED MAY 19, 1906.

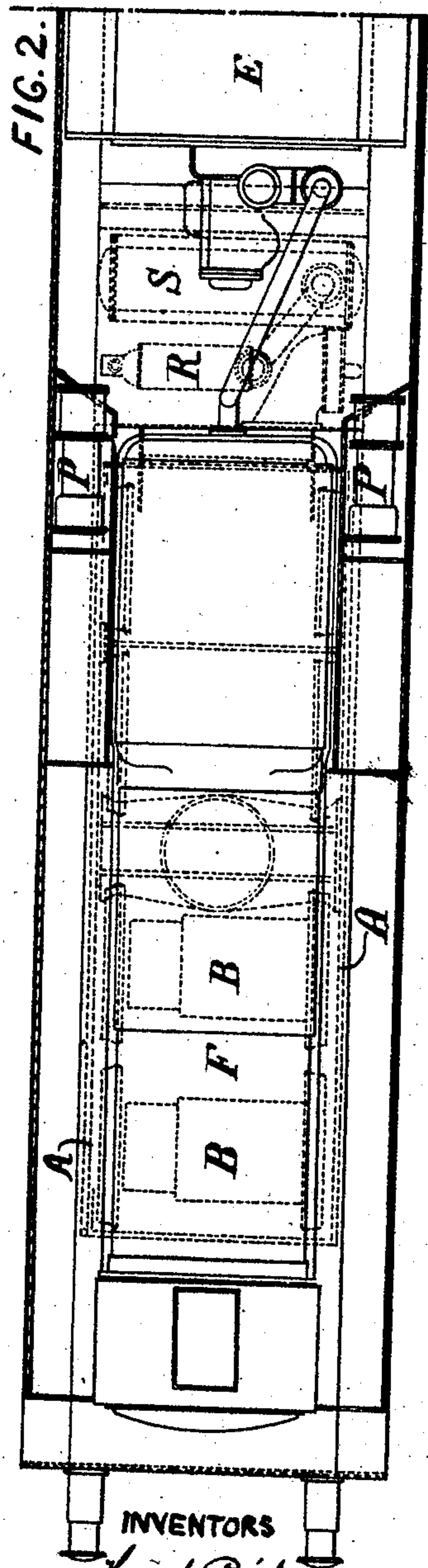
2 SHEETS—SHEET 1.



WITNESSES

William Abbe

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INVENTORS

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No. 840,255.

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APPLICATION FILED MAY 18, 1906.

2 SHEETS—SHEET 2.

FIG. 1.

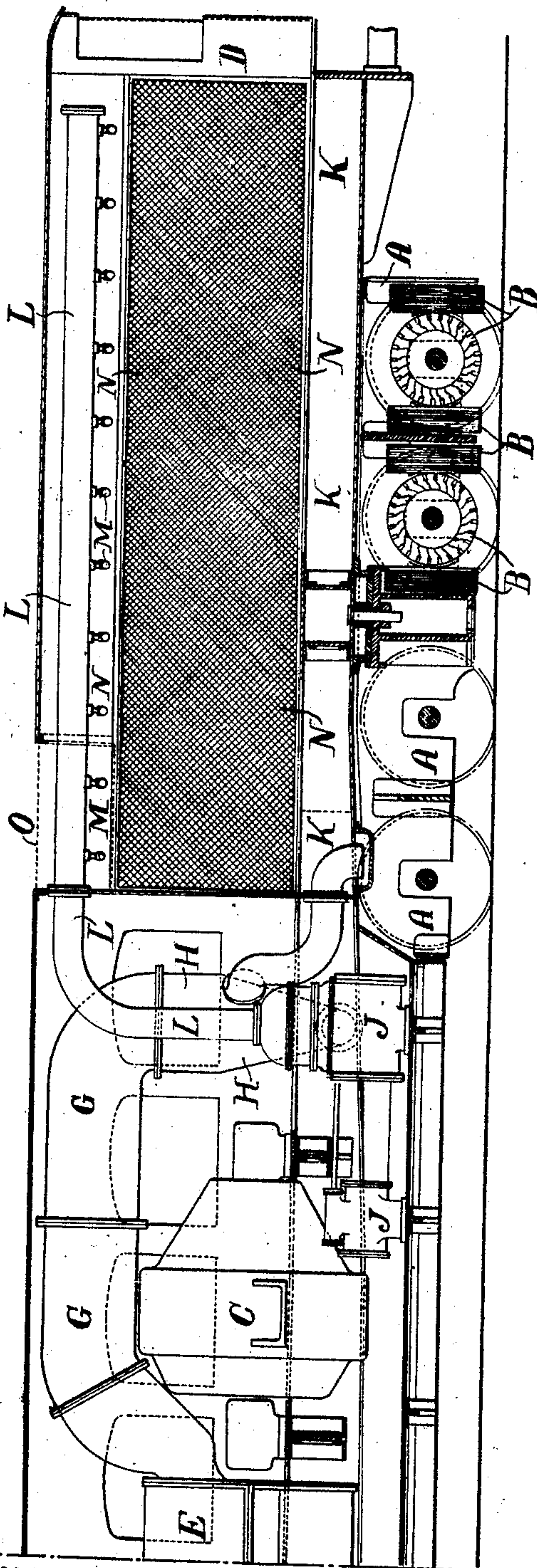
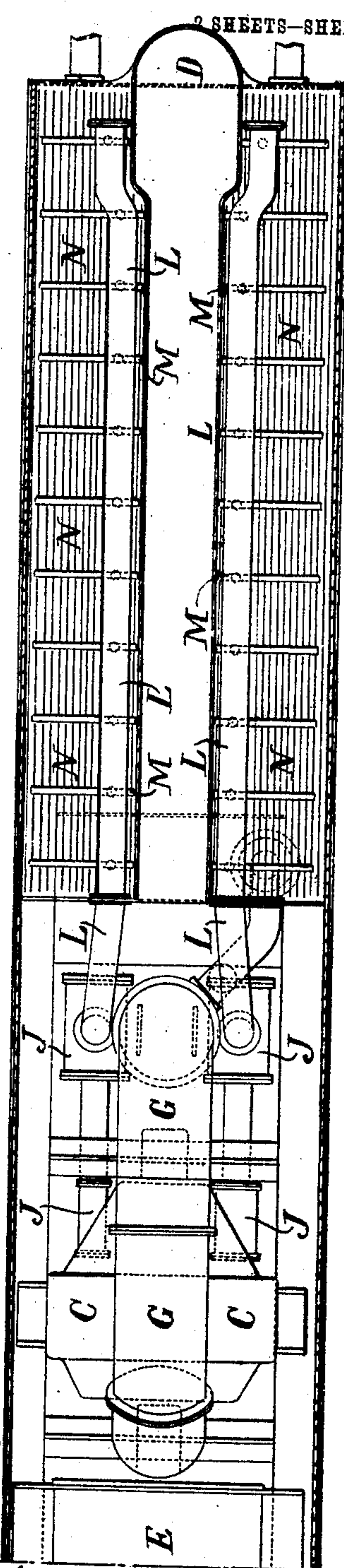


FIG. 2.



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UNITED STATES PATENT OFFICE.

HUGH REID, OF SPRINGBURN, AND DAVID McNAB RAMSAY, OF
UDDINGSTON, SCOTLAND.

LOCOMOTIVE.

No. 840,255.

Specification of Letters Patent.

Patented Jan. 1, 1907.

Application filed May 18, 1906. Serial No. 317,596.

To all whom it may concern:

Be it known that we, HUGH REID and DAVID McNAB RAMSAY, subjects of the King of Great Britain and Ireland, and residents, respectively, of Springburn, in the county of Glasgow, and of Uddingston, in the county of Lanark, Scotland, (whose postal addresses are, respectively, Hyde Park Works, Springburn, Glasgow, and 2 Sunnyside avenue, Uddingston, Scotland,) have invented certain new and useful Improvements in Locomotives, and of which the following is a specification.

This invention relates to condensing steam-electric locomotives of the type described in our United States Patent specification No. 805,999, of 1905, and has for its object to provide a condensing system alternative to that described in our said specification and such that the apparatus as a whole, while possessing all the advantages of that described, is of greater advantage under certain conditions—such, for example, as where the power to be developed relatively to the space at disposal for the apparatus is so great that a sufficient area for the installation of an effective air-cooled condenser is not available.

According to our present invention we apply instead of the air-cooled condenser of our earlier specification a condenser in which water is the cooling or condensing medium and which may be of any suitable known form, and for cooling the water which has been used in the condenser (and in some cases also the condensed steam) we provide any suitable known form of cooling apparatus in which air is used as the cooling medium.

The cooling and condensing apparatus, or either of them, may be carried upon the locomotive, or the whole or any part may be carried upon a separate truck or trucks, as may also be a supply of water to make up for losses in the condenser or elsewhere.

The air which has been heated by passing through the cooling apparatus may be utilized in the steam-generator to maintain a draft either with or without further preliminary heating—for example, in a heater arranged in the smoke-box.

The water-cooling apparatus may be of any suitable known type, and the cooling-air may be circulated through it by the passage of the locomotive through the atmosphere, or alternatively, or in addition the air may be

impelled or induced by fans, blowers, exhausters, injectors, or ejectors.

In order to more fully explain the invention and as illustrative of the manner of performing it, there are hereunto appended two sheets of explanatory drawings of an example of a condensing steam-electric locomotive made according to the invention, this example being only illustrative and in no measure restrictive.

The drawings, throughout which like reference-letters indicate like parts, show somewhat diagrammatically the locomotive in sectional side elevation in Figure 1 and in plan in Fig. 2, the views for convenience being divided at about the center of their length, the rear halves being upon Sheet 1 of the drawings, the front upon Sheet 2.

In this example the locomotive is carried upon bogies A at either end, each bogie being upon eight wheels and four of the wheels of each being driven by electric motors B, the armatures of which are carried directly by the axles. Current is supplied to the motors B by a dynamo C, regulating devices (not shown) of usual kind being arranged in a driving-compartment D at the front end of the vehicle. The dynamo C is driven by a turbine E, in this case of the "Curtis" type, directly connected to it, and steam is supplied to the turbine by a boiler F of locomotive type, placed with its fire-box toward the center of the vehicle.

The exhaust-steam from the turbine E passes by an exhaust-pipe G to a jet-condenser H, operated by pumps J, drawing from a supply-tank K, arranged at the lower part of the front end of the structure and delivering the mixed steam, condensing, and condensed water to pipes L, which are arranged in the upper part of the forward end of the structure and are provided with a series of perforated distributing branch pipes M, arranged transversely. These branch pipes M deliver the hot water over screens N, of meshed wire, arranged longitudinally in this part of the structure. The meshes of the screens are of a size to retain drops of water, and the water delivered to them is cooled while flowing down by air entering the structure at the forward end, passing over the screens and escaping through openings O, the size of which may be adjusted by

sliding doors. The cooled water from the screens descends into the tank K, from which it is drawn by the pumps J, as described, and by feed-pumps P (the connection of which is not shown) for boiler-feeding, the tank K being of a capacity sufficient to make up for any losses there may be during the length of run for which the locomotive is designed. Vacuum is of course maintained in the condenser by the pumps J.

A turbine-operated blower R is provided for the boiler-fire and for the feed-water a feed-water heater S.

The locomotive is operated from the driving-station D, which communicates with what may be termed the "engine-room" at the center by a central passage through the cooling-compartment, (within which are arranged the screens N,) and it is to be understood that the usual electrical and steam equipment is provided.

Obviously the described arrangement may be very widely varied, vacuum may be maintained in the exhaust-chamber of the turbine, and the steam be condensed by water in other ways—for example, by one or more ejector-condensers in combination with one or more circulating-pumps for raising and distributing the water to the cooling apparatus—or a surface condenser and the requisite pumps may be used, in which case the condensing-water and the water of condensation do not, of course, become mixed until they are delivered to the supply-tank.

What we claim is—

1. A motor-vehicle carrying an isolated steam-electric generating plant having a steam-turbine in combination with a water-

cooled condenser and means for cooling the water used.

2. A motor-vehicle carrying an isolated steam-electric generating plant having a steam-turbine in combination with a jet-condenser, and means for cooling the water used.

3. A motor-vehicle carrying an isolated steam-electric generating plant having a steam-turbine in combination with a water-cooled condenser and means for cooling by air the water used.

4. A motor-vehicle carrying an isolated steam-electric generating plant having a steam-turbine in combination with a jet-condenser and means for cooling by air the water used.

5. A motor-vehicle carrying an isolated steam-electric generating plant having a steam-turbine in combination with a water-cooled condenser and vertical screens exposed to air-currents and over which the water from the condenser is delivered for cooling.

6. A motor-vehicle carrying an isolated steam-electric generating plant having a steam-turbine in combination with a jet-condenser and vertical screens arranged lengthwise in the vehicle exposed to air-currents and over which the water from the condenser is delivered for cooling.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

HUGH REID.

DAVID McNAB RAMSAY.

Witnesses:

JAMES EAGLESOM,
FRED. MIDDLETON.