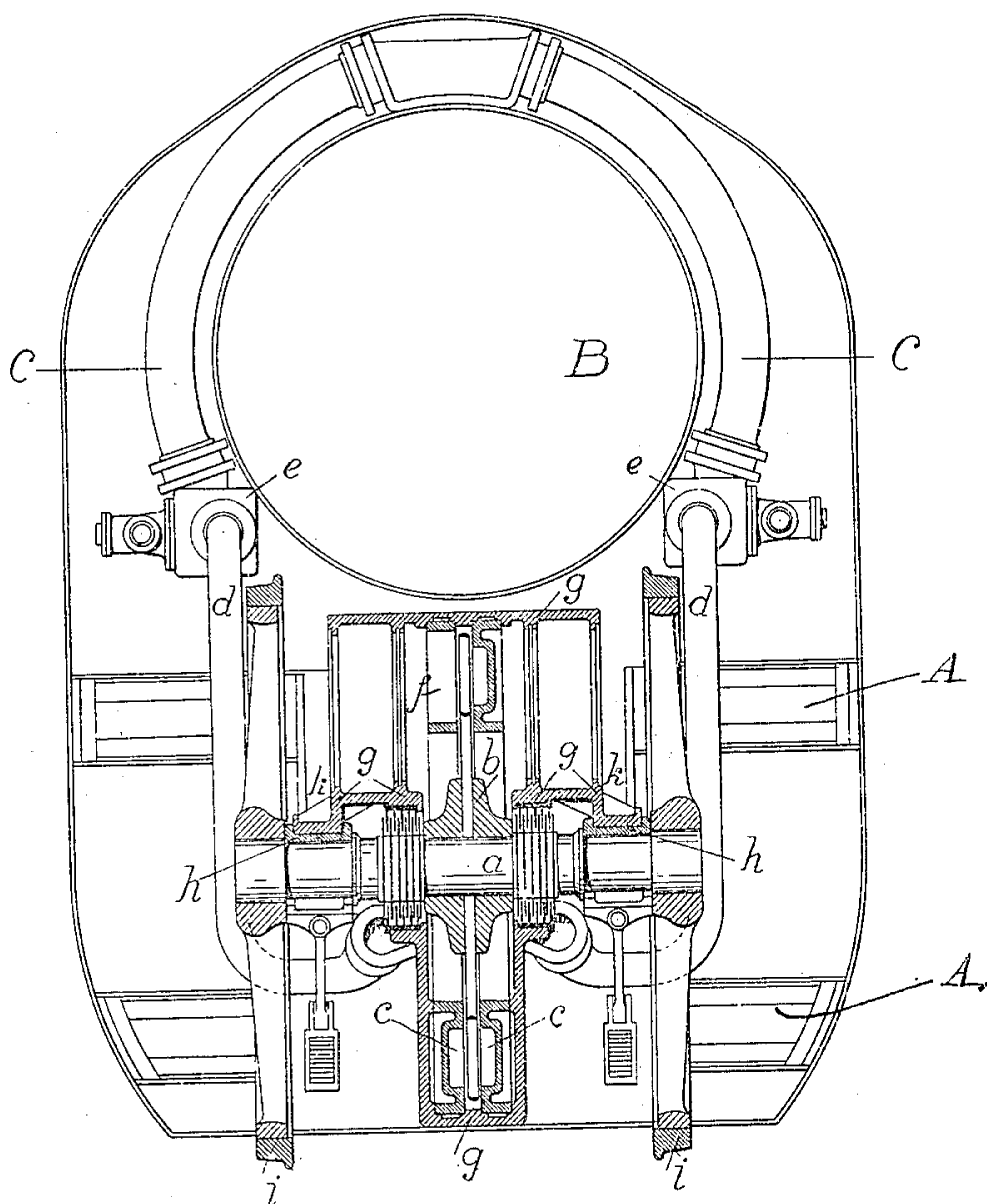


No. 812,277.

PATENTED FEB. 13, 1906.

H. LENTZ.
TURBINE DRIVEN LOCOMOTIVE.
APPLICATION FILED AUG. 16, 1905.



WITNESSES;

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UNITED STATES PATENT OFFICE.

HUGO LENTZ, OF BERLIN, GERMANY.

TURBINE-DRIVEN LOCOMOTIVE.

No. 812,277.

Specification of Letters Patent.

Patented Feb. 13, 1906.

Application filed August 16, 1905. Serial No. 274,376.

To all whom it may concern:

Be it known that I, HUGO LENTZ, a subject of the German Emperor, residing at 10-11 Potsdamerstrasse, Berlin, Germany, have invented a new and useful Turbine-Driven Locomotive; and I do hereby declare the following to be a full, clear, and exact description of the same.

This invention relates to improvements in turbine-engines, especially when employed in connection with movable vehicles, such as locomotives.

In a pending application, Serial No. 270,329, for patent of the United States I have shown and described a combination of parts wherein the turbine running wheel or turbine-wheels and the axle or shaft driven thereby are mounted for free rocking movements in the casing, which casing is not supported by the said axle or shaft, but is connected to a fixed part of the locomotive or locomotive-frame.

One feature which distinguishes the present invention from that just above outlined is that in the present application it is preferred to have the turbine-casing supported by the shaft or axle. As a result a simple, economical, durable, and efficient structure is produced wherein the relative movement of the turbine wheel or wheels and guiding means is prevented. A second distinction not found in my said earlier application is that it is not necessary to employ guiding means having a movement within or independently of the turbine-casing.

The accompanying drawing shows the driving-wheels and the parts of the turbine-engine in cross-section, while the running axle is shown by full lines.

A indicates a locomotive-frame, and B indicates a steam-generator mounted thereon.

C C are pipes leading steam from the generator to regulating boxes or chambers *e e*, from whence the steam is delivered by pipes *d* and *d'* to one or more nozzles, which guide the injection of the steam against the impact-faces of paddles or against blades carried by and driving a running wheel *b*. Only one such wheel is shown in the drawing; but following out the well-known modification a succession of running wheels may be employed.

The turbine-casing is indicated by *g*, and

this casing is provided with outwardly-projecting side extensions *K* and *K*, which are adapted to rest upon and to rise and fall with axle-boxes *h h*. The running-wheel shaft constitutes the driving-wheel axle *a*, and the turbine-wheel *b* is fixedly connected to said axle. The axle runs freely through the opposite sides or shells of the casing and through the axle-boxes, and the locomotive-drivers *i i* are secured to the extremities of such axle. At the openings in the casing through which the axle passes I have provided a novel form of packing to prevent the escape of steam. The packing arrangement preferred by me for such purpose will comprise a flanged tubular box or ring having a plurality of packing-rings which closely fit the inner wall of such box or ring and a plurality of packing-rings, placed alternatively with respect of the first-named rings, surrounding and closely engaging the axle *a*. Two sets of packing devices are preferably employed by me at opposite sides of the turbine-wheel *b*.

The turbine-casing *g* is free of the locomotive or locomotive-frame and, as before noted, will rise and fall with the axle *a*, which has free rising-and-falling movements and responds to twisting strains when running around curves, over rail ends, raised fish-plates, and running over obstructions, such as sticks, stones, bolts, &c. The improvements also provide for the rising and falling simultaneously of both ends of the axle *a*, which constantly occurs during the speeding of the locomotive. The turbine-wheel *b* being fixed to said axle will constantly drive the same irrespective of its rocking, twisting, or other movements, and suitable arrangements will be provided whereby the jet or jets of steam from the supply-nozzle or supply-nozzles will be directed in the most effective manner against the impact-faces of the paddles. Such arrangement will preferably comprise means whereby the nozzle or nozzles or the discharge end or ends thereof will rise and fall or oscillate with the running wheel *b*. Preferably also the running wheel will be reversible by being provided with reversible paddles or otherwise, or separate reversing means may be provided in order that the locomotive may run in either direction.

The structure shown in the drawing is provided with guide means which either direct

a jet of steam from wheel to wheel of a multi-stage turbine or repeatedly return the jets of steam to the paddles of the same running wheel, thereby in any event securing the effects due to repeated injections of steam against the impact-faces of the turbine-paddles.

In the drawing, *c c* indicate the guide means, formed in the two shells or halves of the casing to repeatedly return the steam to the paddle-faces. The frames of the guide means are secured against rotary or other movements in the turbine-casing. The exhaust of the casing is shown at *f* in the drawing.

It will be obvious that with a structure like that illustrated in the drawing the relative and most effective positions of wheel *b*, guiding means and casing will always be maintained despite changes and variations and rising and falling and twisting of the axle.

What I claim is—

1. In combination, a locomotive-frame, a driving-axle therefor, a turbine-wheel connected with said axle, a turbine-casing, for said wheel, provided with bearing parts which rest upon axle-boxes through which the axle passes.

2. In combination, a locomotive-frame, a driving-axle therefor, a turbine-wheel connected with said axle, a turbine-casing, for said wheel, provided with bearing parts which are connected with axle-boxes through which the axle passes.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HUGO LENTZ.

Witnesses:

HENRY HASPER,
WILLIAM MAYNER.