No. 649,109. Patented May 8, 1900.

W. R. RENSHAW.

LOCOMOTIVE OR TRACTION ENGINE.

(Application filed Feb. 15, 1900.)

(No Model.)

Fig. 2.

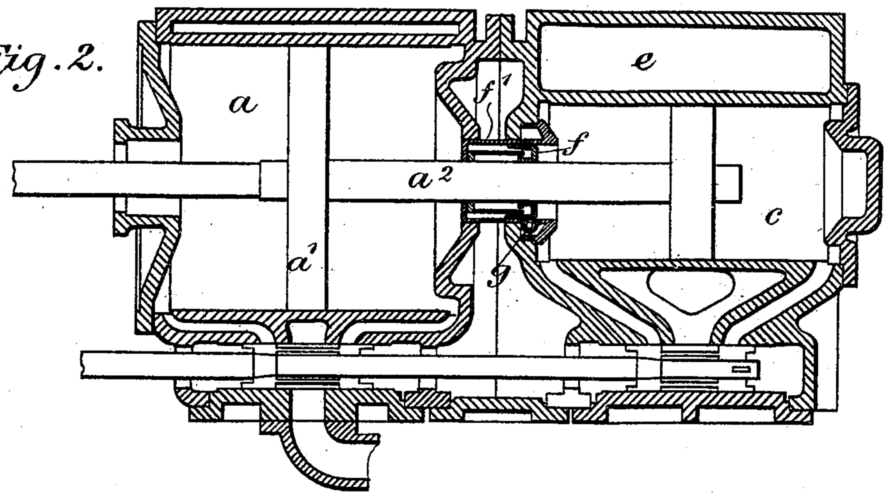


Fig. 1.

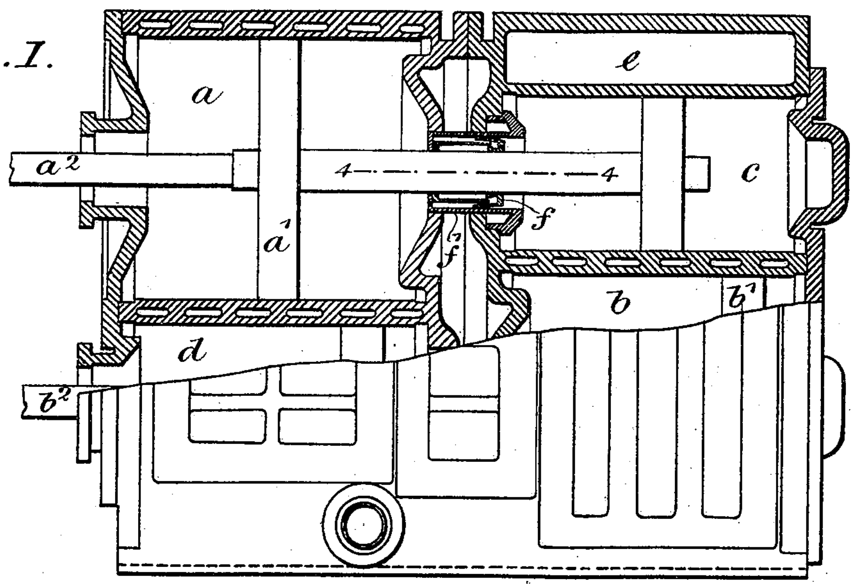


Fig. 4.

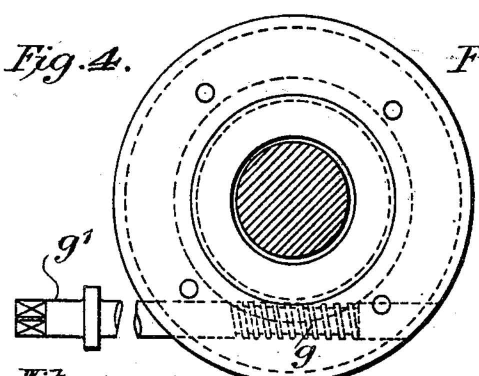
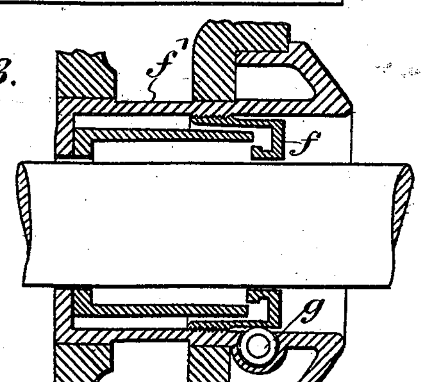


Fig. 3.



Witnesses.

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WILLIAM ROBERT RENSHAW, OF LONDON, ENGLAND.

LOCOMOTIVE OR TRACTION ENGINE.

SPECIFICATION forming part of Letters Patent No. 649,109, dated May 8, 1900.

Application filed February 15, 1900. Serial No. 5,302. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM ROBERT RENSHAW, engineer, a subject of the Queen of Great Britain, residing at No. 47 Victoria street, Westminster, London, in the county of Middlesex, England, have invented certain new and useful Improvements in Locomotive or Traction Engines, of which the following is a specification.

The invention particularly relates to compound engines; and my object is to obtain greater capacity and more equal strain. For this purpose the low-pressure cylinders are arranged one behind the other, overlapping but not in line with each other, and each high-pressure cylinder is arranged tandem with one of the low-pressure cylinders and alongside of the other, the piston of each high-pressure cylinder being preferably connected directly to the piston-rod of the low-pressure cylinder in line with which it is arranged.

In the drawings, Figures 1 and 2 show longitudinal sections at right angles to each other of a four-cylinder compound engine. Fig. 3 shows a local section, to a larger scale, on the line 4 4 of Fig. 1, showing the stuffing-box; and Fig. 4 is an end view of the same.

I prefer to arrange the high and low pressure cylinders of each engine tandem, the high-pressure cylinder of one engine being alongside the low-pressure cylinder of the other.

a and b are the low-pressure cylinders, a' and b' their pistons, and a^2 and b^2 the piston-rods. c and d are the high-pressure cylinders. I cast the four cylinders together, by preference, forming an intermediate receiver e around them, the exhaust from the high-pressure cylinders opening direct into this receiver, which also forms a steam-jacket. It will be observed that the pistons of the high-pressure cylinders are each connected directly with the piston-rod of the low-pressure cylinder in line with it. It will also be observed that one of the high-pressure cylinders is arranged on one side of one of the low-pressure cylinders and the other high-pressure cylinder is arranged on the opposite side of the other low-pressure cylinder. This gives a compact arrangement which is very desirable.

Figs. 3 and 4 show an arrangement for screwing down the covers f of the stuffing-boxes between the high and low pressure cylinders. The cover f screws into the box f', as shown, and has a worm-wheel formed around it, gearing with a worm g, the spindle g' of which projects to the outside of the cylinders.

I claim as my invention—

1. The combination of two low-pressure cylinders arranged one behind the other, overlapping but not in line with each other, and two high-pressure cylinders, one of which is arranged on one side of one low-pressure cylinder, and the other of which is arranged on the opposite side of the other low-pressure cylinder.

2. The combination of two high-pressure and two low-pressure cylinders, the low-pressure cylinders being arranged one behind the other, overlapping but not in line with each other, and each high-pressure cylinder being arranged tandem with one of the low-pressure cylinders, and alongside the other.

3. The combination of two high-pressure and two low-pressure cylinders, with their pistons and piston-rods, the low-pressure cylinders being arranged one behind the other, overlapping but not in line with each other, and each high-pressure cylinder being arranged tandem with one of the low-pressure cylinders, and having its piston directly connected to the piston-rod of the low-pressure cylinder in line with it.

WILLIAM ROBERT RENSHAW.

Witnesses:

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