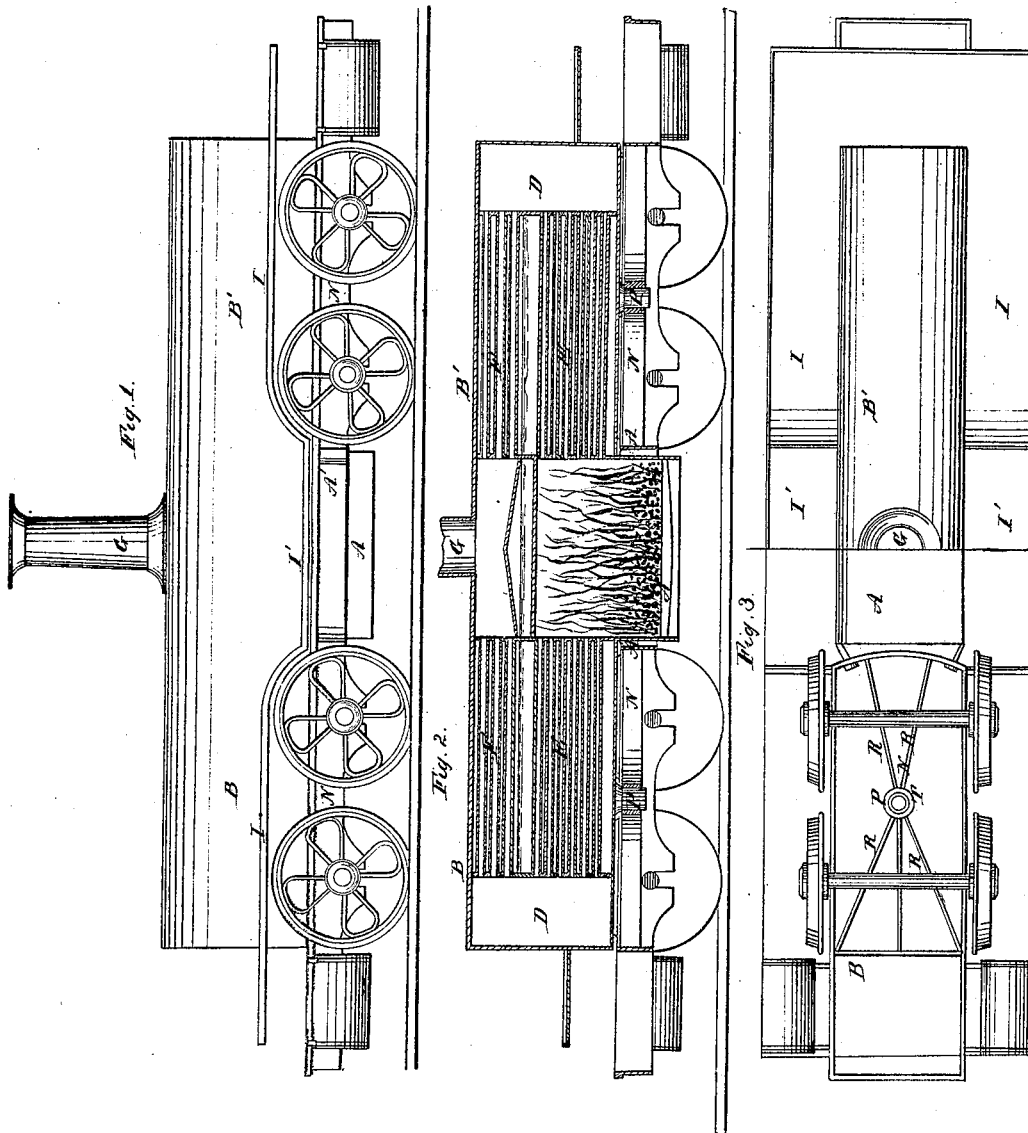


R.F. Fairlie,
Locomotive Engine,
No 52,117, *Patented Jan. 16, 1866.*



Witnesses:
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UNITED STATES PATENT OFFICE.

ROBERT FRANCIS FAIRLIE, OF LONDON, ENGLAND.

IMPROVEMENT IN LOCOMOTIVE-ENGINES.

Specification forming part of Letters Patent No. 52,117, dated January 16, 1866.

To all whom it may concern:

Be it known that I, ROBERT FRANCIS FAIRLIE, of London, England, have invented a new and useful Improvement in Locomotive-Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a side elevation of this invention. Fig. 2 is a longitudinal vertical section of the same. Fig. 3 is an inverted plan of one-half and a top view of the other half of the same.

Similar letters of reference indicate like parts.

The object of this invention is to obtain a large amount of tractive power and at the same time to avoid any excessive pressure of the driving-wheels of a locomotive, adapting itself readily to the turning of sharp curves without the disadvantages usually attending the action of large locomotives under like circumstances. These objects are obtained by mounting the boiler on the center of two truck-frames, each having four or more wheels and one, two, or more cylinders, each truck and its adjuncts forming two distinct engines, which are each complete in themselves, the steam being supplied from the boiler to both sets of engines. The boiler is thus mounted on a large number of wheels—say, eight for passenger and express trains and twelve for heavy-goods engines—which are disposed in such a manner as to permit the engine running freely on the sharpest curves. The fire-box of the boiler is in the middle, and from said fire-box extends the body of the boiler in either direction, terminating at each end in a smoke or sub fire box or flue, and chimneys may be mounted on these smoke-boxes, as usual, or the boiler may be made with an upper and lower series of tubes with one smoke-stack in the middle, so as to compel the products of combustion to pass through the lower set of tubes and then back through the upper set to the smoke-stack.

A A is the fire-box, situated at mid-length of the locomotive. From this fire-box the body B B' of the boiler extends in both directions, the whole being riveted and put to-

gether in the ordinary manner. The length of each part of the body B or B' may be about or nearly the length of an ordinary boiler. The locomotive is therefore altogether of considerable length. The fire-door is intended to be at the side of the fire-box, and there may be one on either side of the engine.

D D are smoke or combustion chambers at each end of the boiler for the reception of the products of combustion, and communicating with the fire-box A by means of tubes E, as in an ordinary engine. These chambers D may each be furnished with a chimney for the escape of smoke and of the steam from the blast-pipes, as usual; but I prefer to employ a set of return-tubes, F, communicating with a smoke-chamber, G, above the fire-box, over which one central chimney is provided.

A platform, I I', is carried all round the boiler at the level of the lower part of its body, forming at the fire-box foot-plates I' I', and suitable railings may be provided as security for the engineer and stoker.

The bodies B B' of the boiler are covered in and inclosed by a casing fitting somewhat closely to them and against the sides by vertical walls or plates. The space inclosed by these walls, and between them and the bodies, may be utilized as coal-bunkers, as also the upper part of such space above the boiler. At one or at both ends of the locomotive some portion of this inclosed space may be utilized as a tank or tanks for the supply of water. Thus it will be seen that the whole of the water and fuel may be concentrated upon and carried by the locomotive itself.

N N' are the bogie and engine frames, which are constructed totally distinct from the boiler and connected thereto by the bogie or fulcrum pin P, but bearing otherwise thereon, as will be hereinafter explained. Each frame-work is mounted on wheels and carries the steam-cylinders and gear of the engine, somewhat as in ordinary locomotives, as also the buffers and drag-chains and couplings at one end. The frames N N' are made with strong diagonal and cross ties or arms R R, which radiate from the center boss, T, of the bogie-pin P. On these arms quadrant-plates may be formed, and these plates, together with the pin P, made to sustain the weight of the boiler. The ends of the frames N N' next the fire-box are in

the segment of a circle described from the pin P, and abut closely on the fire-box without actually touching it, and a strong iron frame, A', carried round the fire-box A, serves to steady the circular ends of the frames N N'. The connection between the boiler and the frames N' N' may, however, be effected in a great many different ways, and I do not wish to confine myself to any particular method of attaching the bogie-frames and the boiler together, although it must be remarked that the arrangement shown in the drawings is simple, cheap, and durable, and may therefore be applied in preference to any other which I can at present suggest.

What I claim as my invention, and desire to

secure by Letters Patent of the United States of America, is—

1. The arrangement of the fire-box and the two boilers extending from opposite sides thereof with the two bogie-frames, as set forth.

2. The arrangement of two trucks, each provided with four or more wheels and with one or more steam-cylinders, in combination with a steam-boiler, B B', constructed and operating substantially as and for the purpose set forth.

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Witnesses:

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