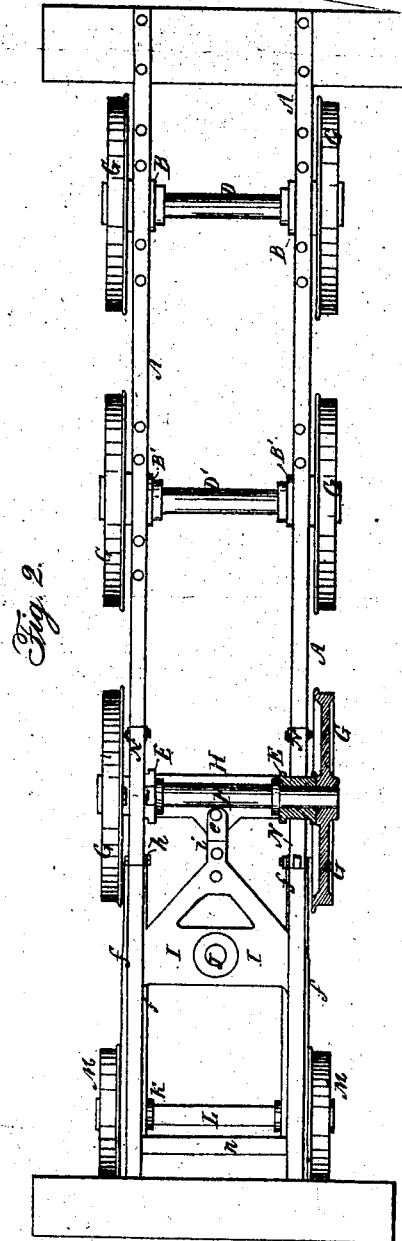
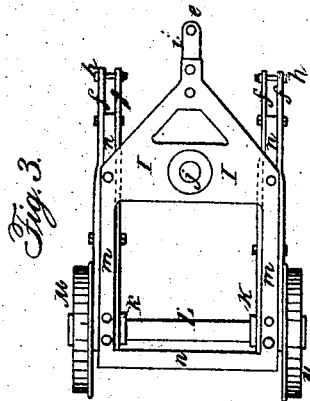
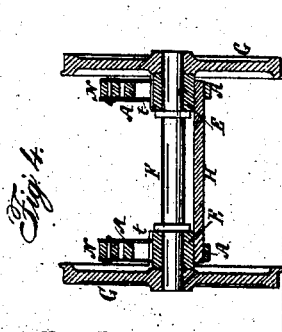
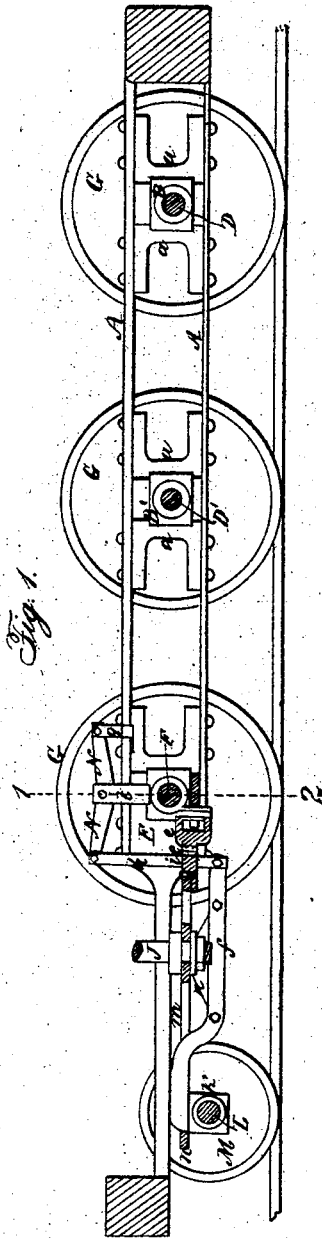


J. P. LAIRD.
Locomotive Axle.

No. 53,009.

Patented Mar. 6, 1866.



Witnesses:

Wm Albert Steel
John Parker

J P Laird Inventor.
By his Atty
H. Howson

UNITED STATES PATENT OFFICE.

JOHN P. LAIRD, OF ALTOONA, PENNSYLVANIA.

IMPROVEMENT IN BEARINGS OF LOCOMOTIVE-AXLES.

Specification forming part of Letters Patent No. 53,009, dated March 6, 1866.

To all whom it may concern:

Be it known that I, JOHN P. LAIRD, of Altoona, Blair county, Pennsylvania, have invented an Improvement in Locomotives; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists in the application to a locomotive of a driving-axle adapted to boxes which can slide laterally in the frame of the locomotive, the said axle and boxes being combined with a truck-frame having an axle and wheels, all substantially as hereinafter set forth.

The object of my invention is to obtain increased traction without adding to the length of the locomotive.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawings, which form a part of this specification, Figure 1 represents a longitudinal section of part of a locomotive engine with my improvement; Fig. 2, a plan view; Fig. 3, a plan view of the truck-frame, and Fig. 4 a transverse section on the line 1 2, Fig. 1.

Similar letters refer to similar parts throughout the several views.

A A represent the two side frames of the locomotive, and to each frame are adapted the usual axle-boxes B and B' for the axles D and D', and the axle-box E for receiving the axle F, the three axles being provided with the driving-wheels G, which are coupled together, what are known as "outside" cylinders being used in connection with my improvements in the present instance.

The axle-boxes B and B' are of the usual construction, being so fitted to the guides *a a* as to slide vertically therein without having any lateral movement, and the journals having the ordinary limited end play in the boxes. The boxes E, however, while arranged to fit snugly in the guides in one direction, are so constructed that they can have a lateral movement of from one to two and a half inches, the journals of the axles F having no end play in the said boxes.

The opposite boxes E E are connected together in the present instance by a cross-bar, H, to which a projection, *i*, from the truck-frame I is jointed by a pin, *e*, the truck-frame being arranged to turn on a king-bolt, J, secured to a permanent part of the locomotive. This truck-frame has two projecting plates, *m m*, which are connected together at the end by a cross-bar, *n*, and to each plate *m* is secured a box, K, the two boxes being adapted to the journals of the axle L, which is provided with the usual flanged wheel M.

The truck-frame I rests on two springs, *n*, each being situated between and connected to two arms, *f*, which rest on one of the axle-boxes K, the opposite end of the two arms being connected by links *h* to one end of a spring, N, the opposite end of which is connected by links *g* to one of the side frames, a bar, *t*, secured to the spring, bearing on one of the axle-boxes E.

In locomotives of the class to which my invention relates it has been usual to couple the two axles D and D', four driving-wheels only being thus employed. As a great portion of the weight of the boiler was sustained by the truck in these engines, their traction was limited; hence it has been common to increase the length of the engine in order to accommodate another pair of driving-wheels, making six in all, which sustained the greater portion of the weight of the boiler, the plan consequently resulting in increased traction; but this result could only be attained by making the locomotive of such a length that with all the advantages presented by the truck curves in the road could not be traversed at a high rate of speed with safety.

My improvements have been devised with the view of obtaining the desired increase of traction without the necessity of lengthening the engine for the accommodation of an additional pair of driving-wheels.

When a locomotive constructed according to my improvement traverses a curve in the road there must of necessity be an end movement of the axle F, and this movement is imparted through the truck-frame I to the axle L—in fact the sliding axle F and its wheels, combined with the truck-frame I, axle L, and its wheels, perform precisely the same duty as an ordinary truck, and as the wheels of this

sliding axle F are coupled to those of the axles D and D' it will be evident that the desired increase of traction is obtained without the necessity of resorting to the usual plan of lengthening the engine for the accommodation of an additional pair of driving-wheels.

I claim as my invention and desire to secure by Letters Patent—

1. The application to a locomotive, substantially in the manner described, of a driving-axle adapted to boxes which can slide laterally in the frame of the locomotive, for the purpose specified.

2. The combination of the said driving-axle and its sliding boxes with the truck-frame I and its axle L and wheels M, the whole being arranged and operating substantially as and for the purpose herein set forth.

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

JNO. P. LAIRD.

Witnesses:

JESSE S. WALTON,
JOHN W. HUMES.