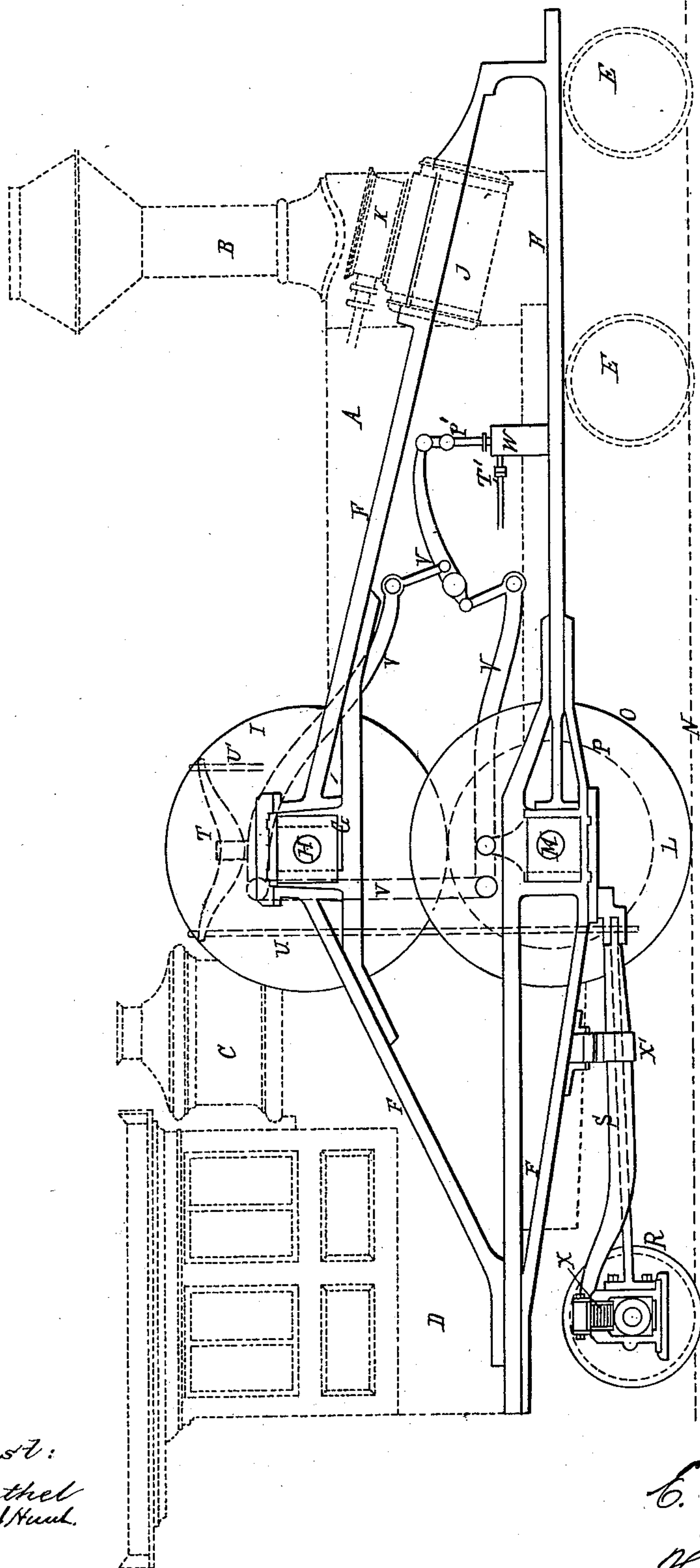


(No Model.)

E. FONTAINE.  
Locomotive.

No. 230,472.

Patented July 27, 1880.



Attest:  
H. Barthel  
Charles J. Hunt.

Inventor:  
E. Fontaine  
By atty  
H. S. Sprague

# UNITED STATES PATENT OFFICE.

EUGENE FONTAINE, OF DETROIT, MICHIGAN, ASSIGNOR OF ONE-HALF OF HIS RIGHT TO DEXTER M. FERRY, JAMES McMILLAN, AND THOS. S. CHRISTIE, OF SAME PLACE, AS TRUSTEES.

## LOCOMOTIVE.

SPECIFICATION forming part of Letters Patent No. 230,472, dated July 27, 1880.

Application filed April 15, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, EUGENE FONTAINE, of Detroit, in the county of Wayne and State of Michigan, have invented an Improvement in Locomotives, of which the following is a specification.

The nature of my invention relates to new and useful improvements in locomotives and steam-carriages, whereby the running speed may be materially increased without increasing the number of reciprocations of the pistons, and at the same time so arranging the parts that the center of gravity of the locomotive will not be so elevated as to render it liable to leave the track in turning curves, as hereinafter more fully set forth.

It is found in practice that to attempt to increase the speed of locomotives as ordinarily constructed, it can be only attained by an enlargement of the driving-wheels, or by a pro rata increase in the number of the revolutions of the pistons. To enlarge the drivers has been found partially impracticable, because by so doing the center of gravity of the locomotive was so elevated as to cause such a swaying or gage motion that, except on a straight track, the locomotive is liable to leave the track; and it has also been found impracticable to materially increase the number of reciprocations of the piston, except at a large expenditure of fuel and a possible straining of the boiler to carry steam at such a height as to overcome the backlash or expansion of steam in the cylinders, which cannot escape with sufficient rapidity through the ordinary escape-ports.

The object of my invention, therefore, is to so construct an engine that its speed may be materially increased over that of engines of the ordinary construction without meeting the objections named above or others that might be named, as more fully hereinafter described.

In the accompanying drawing, which forms a part of this specification, there is shown a side elevation of my improved engine provided with one pair of drivers, and it will readily be seen that two or more pairs of drivers may be employed, connected together in

the usual manner, without departing from the spirit of my invention.

In the drawing, A represents a boiler; B, a smoke-stack; C, the dome, and E the wheels of the forward truck, which may all be of the usual construction.

F represents a supporting-frame, which supports the axle-boxes G with their pedestals, and H the axle upon which are secured the driving-wheels I.

J represents the steam-cylinder and K K the steam-chest, which are connected to the driving-axle H by the usual pitman and crank, rods, and eccentrics.

L represents a bearing-wheel designed to run upon the rail N and secured to the axle M. This wheel L is provided with two treads, one of which, O, runs upon the rail, while the tread P, of smaller diameter than the tread O, projects from the face of the wheel L and is designed to support the driver I.

It will be perceived that the axle H of the driving-wheels I is arranged above the center of gravity of the locomotive in my construction, whereby the latter is not so liable to leave the track as in similar constructions in locomotives in which the center of gravity of the locomotive is above the axle of a driving-wheel bearing on truck-wheels, thereby rendering the locomotive top-heavy and extremely liable to be thrown from the track in turning curves.

R represents a section of a truck under the cab, connected by an equalizer, S, which, in turn, is connected to the spring T by means of the rod U, and the rod U' may be connected to any part of the frame below.

V represents a system of compound levers, the outer one of which is connected at its outer end with the piston-rod P', attached to a piston moving in the air-cylinder W, the piston being actuated by an air-pump (not shown in the drawing) connected with the air-cylinder W by the air-tube T', controlled by suitable connections from the cab; and these levers are so arranged, as shown, that the pressure or friction of the driver I upon the tread P of the wheel L may be increased or diminished at will, and as occasion may require.



I do not desire to confine myself to the system of leverage here shown to produce this result, as other means may be adopted for the purpose.

The truck R, which is designed as a guide to assist in keeping the engine on the track, is supplied with elastic bearings X, and the equalizer S, by means of which and the connection U and the frame F the weight of the rear end of the boiler is thrown upon the axle H of the drivers I, is also provided with an elastic bearing, X', so arranged that the weight of that portion of the locomotive which is not supported by the front truck is thrown upon the axle H and drivers I and transmitted through the wheel L to the track N.

In practice the speed of a locomotive running at a certain number of reciprocations per minute to attain a given number of miles per hour can be increased in the ratio of the difference between the diameter of the drivers I and the tread P of the wheel L, the diameter of said wheel being the same as that of the driver, without increasing the reciprocations of the piston, thereby insuring a much higher rate of speed at about the same cost for the lower rate.

In starting a train drawn by this locomotive the engineer should increase the frictional bearing of the upper upon the lower wheel by use of similar devices to those described, to prevent any possibility of slipping, and when the desired speed is attained this friction may be diminished, as at this time less friction will be required to keep up the speed than was required to attain it.

What I claim as my invention is—

1. In a locomotive, and in combination with drivers having their axles arranged above the center of gravity of the locomotive, the wheels L, interposed between said drivers and the track of a railway, said wheels being provided with a larger and a smaller tread, the former of which rests upon the rail and receives motion by the frictional contact of the latter with the drivers above, substantially as and for the purposes described.

2. In a locomotive, and in combination with the drivers I and wheels L, constructed, arranged, and operating as set forth, the compound levers V, operated by suitable mechanism to increase or diminish at will, while the car is in motion, the friction between said drivers and wheels by drawing together their axles or allowing them to separate, substantially as set forth.

3. In a locomotive, and in combination with a driver acting by a rolling friction upon a wheel with treads of different diameters, the compound levers V, piston-rod P', connected with the compound levers, and air-cylinder W, provided with means for operating its piston, substantially as described, and for the purpose set forth.

4. In a locomotive, and in combination with the frame F, drivers I, wheels L, and their connections, the truck R and equalizer S, provided with elastic bearings, spring T, and connections U U', substantially as and for the purposes set forth.

EUGENE FONTAINE.

Witnesses:

H. S. SPRAGUE,  
J. T. SALTER.