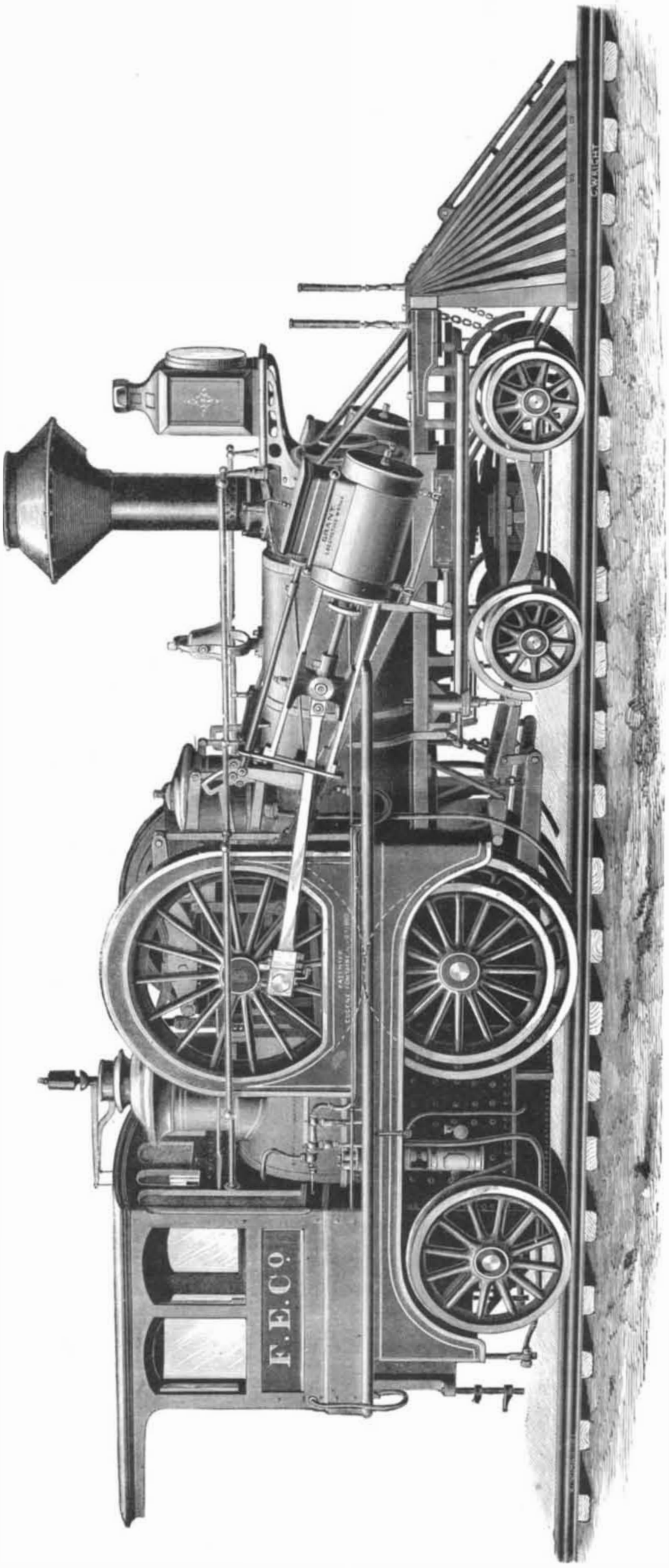
THE FONTAINE LOCOMOTIVE.

We present an engraving of the Fontaine locomotive, which is just now attracting considerable attention in engineering circles. This machine has been in practical use for some time on the Canada Southern Railway, and is credited with being capable of attaining a speed of ninety miles an hour. The second engine of this class was lately turned out of the Grant Locomotive Works, at Paterson, N. J., and is to be tested for two weeks on the New York, Lake Erie, and Western Railroad before it is shipped to its destination.



THE FONTAINE LOCOMOTIVE, BUILT BY THE GRANT LOCOMOTIVE WORKS, PATERSON, N. J.

The peculiarity of the engine is that it has two sets of driving wheels, one on top of the other. The main driving wheels in the Fontaine engines are secured to an elevated axle, above the boiler, and running in boxes supported by a suitably braced frame, the cylinder and slides being set obliquely and in a diagonal line to the axis of the driving axle. The driving wheels are of the usual construction, but do not touch the rails. Resting on the rails are other driving wheels of the same size as the upper ones, with which there is a frictional contact. There being no resistance, when motion is communicated to the upper wheels, the same motion is transmitted to the lower ones by friction. The lower wheels are constructed with two treads, the periphery resting upon the rails, and the other supporting the upper wheels.

To prevent slipping, an air pump is employed, which is operated from the cab, and which acts on a system of levers, by means of which the frictional contact between the upper and lower drivers is diminished or increased, as occasion may require, without disturbing the bearing of the lower wheels on the rails. The engine is also provided with an equalizing truck, so as always to preserve the bearing on the rail.

With this improved construction the running speed may be materially increased without increasing the number of reciprocations of the pistons, and the parts are so arranged 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.

An increase of the speed of locomotives as ordinarily constructed can be attained only by an enlargement of the driving wheels, or by an increase in the number of the revolutions of the pistons. To enlarge the drivers beyond a certain limit is found objectionable, since by so doing the center of gravity of the locomotive is so elevated as to cause a swaying or gauge motion, and the locomotive is liable to leave the track, especially on curves; and it is found impracticable to materially increase the number of reciprocations of the piston, except at the expense of fuel and a possible straining of the boiler to carry steam at such a pressure as to overcome the backlash or expansion of steam in the cylinders, which cannot, under such circumstances, escape with sufficient rapidity through the ordinary exhaust ports.

In the Fontaine locomotive these difficulties are overcome. We give below a table of the principal dimensions, for which, as well as for our engraving, we are indebted to the *Railroad Gazette:*

Gauge of road	4 ft. 8½ in.
Total wheel base	21 ft. 5 in.
Total weight of locomotive in working order	62,000 lb.
Total weight on driving wheels	32,000 lb.
Diameter of driving wheels	70 in.
Diameter of upper friction wheel	72 in.
Diameter of lower friction wheel	56 in.
Diameter of truck wheels	42 in.
Diameter of cylinder	16 in.
Stroke of cylinder	24 in.
Outside diameter of smallest boiler ring	48 in.
Size of grate	62½x33⅝ in.
Number of tubes	140
Diameter of tubes	2 in.
Length of tubes	11 ft.
Square feet of grate surface	14½
Square feet of heating surface in fire box	100
Square feet of heating surface in tubes	806
Total feet of heating surface	906
Exhaust nozzle—single or double	Double.
Diameter of nozzle	3 in.
Size of steam ports	12x1¼ in.
Size of exhaust ports	14x2½ in.
Throw of eccentrics	5 in.
Outside lap of valve	¾ in.
Inside lap of valve	None.
Size of main driving-axle journal	7½ in.
Size of truck-axle journal	5 in.
Capacity of tank	2,000 gallons.

RECENT INVENTIONS.

An improvement in tooth brushes, patented by Mr. Roger S. Tracy, of New York City, relates to tooth brushes having removable pads or brush portions, and the object is to provide a simple, convenient, and inexpensive article of that character.

Mr. Ernst Schultz, of Berlin, Prussia, Germany, has patented a compound for cleaning and preserving polished wood surfaces, consisting of linseed oil, olive oil, mastic, sulphuric ether, tincture of benzoin, oil of turpentine, tincture of curcuma, and nitro-benzole.

An improved grate for stoves has been patented by Mr. John Straszer, of Manchester, Mo. This invention relates more particularly to wood burning stoves of the form known in some localities as the "Tod" stove. The improvement consists in combining a lugged and ribbed reciprocating grate with a stationary grate.

An improved machine for rolling and turning logs has been patented by Mr. William E. Hill, of Big Rapids, Mich. This is an improvement on the construction of the machines for rolling and turning logs for which letters patent No. 233,755 were issued October 26, 1880, to the same inventor.

An improved machine for bending and flaring barrel hoops has been patented by Mr. Erastus Hibbard, of South Barre, N. Y. The object of this invention is to furnish a hoop which will have the proper flare to fit a barrel or tub, and will be of nearly the same thickness at both edges and ready for application to a barrel without work upon it by the cooper; and to construct a machine for manufacturing such hoops, the machine being capable of making the hoops of uniform size, and bending and flaring them at the same time.

Mr. Louis C. Graupner, of Red Bluff, Cal., has patented an improved blind-finishing machine which will bead, rabbet, and joint blinds rapidly and accurately, leaving the side edges of the blind parallel. It can be readily adjusted to operate upon outside blinds or upon inside blinds, rabbeting one edge and making the other edge knuckle-jointed or of any other desired shape.

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