

(No Model.)

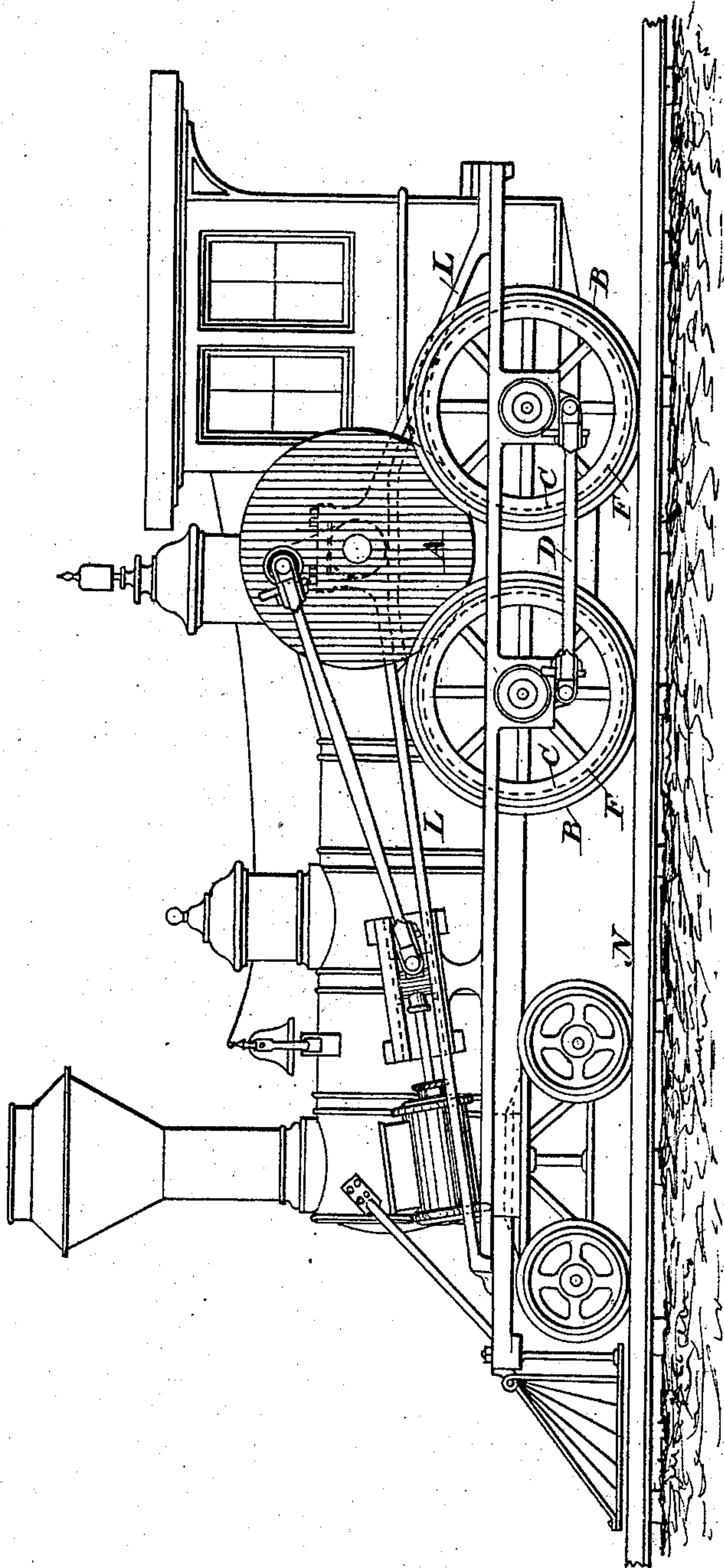
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C. B. CLARK.
Locomotive.

No. 238,349.

Patented March 1, 1881.

FIG. 1.



WITNESSES:

Albert H. Norris.
J. Henry Kaiser

INVENTOR:

Charles B. Clark,

By James L. Norris.

Attorney.

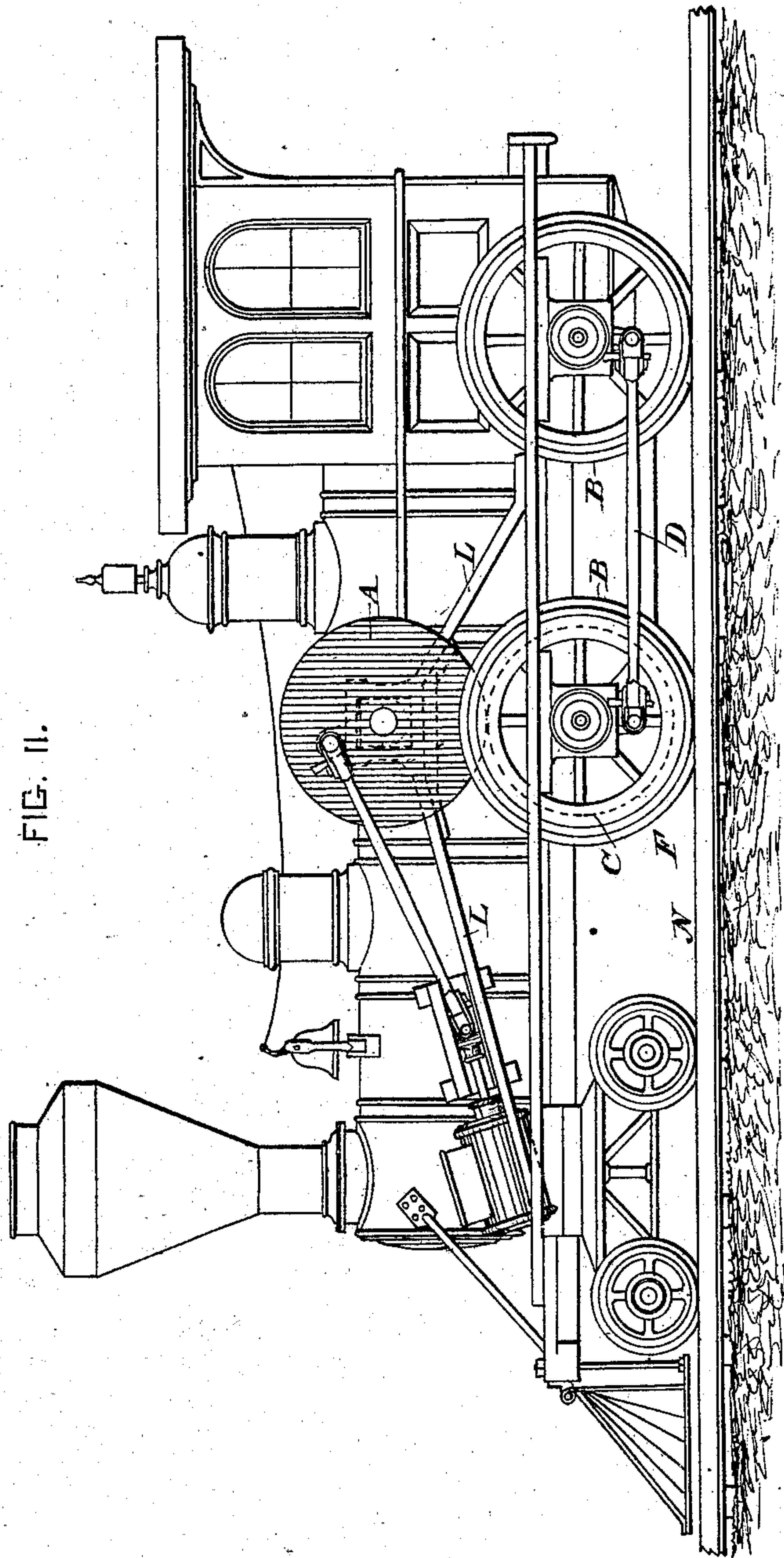
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UNITED STATES PATENT OFFICE.

CHARLES B. CLARK, OF DETROIT, MICHIGAN, ASSIGNOR TO EMMA JENNETTE CLARK, OF SAME PLACE.

LOCOMOTIVE.

SPECIFICATION forming part of Letters Patent No. 238,349, dated March 1, 1881.

Application filed December 30, 1880. (No model.)

To all whom it may concern:

Be it known that I, CHARLES B. CLARK, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented new and useful Improvements in Locomotives, of which the following is a specification.

My invention relates to that class of locomotives which are driven by the frictional contact of one or more pairs of upper driving-wheels with one or more pairs of lower running wheels that rest upon the track.

The object of driving locomotives in the manner just stated has been to increase the running speed without increasing the number of the reciprocations of the pistons, and also to so arrange the parts that the center of gravity of the locomotive will not be so elevated as to render it liable to jump the track in turning curves. I have observed, however, a defect in this class of locomotives, which defect consists in the slipping of the running wheels upon the track at the start, caused by the friction of the driving-wheels. As the track-wheels unquestionably slip at such times they will therefore be liable to slip in ascending steep grades.

It is the object of the present invention to obviate such defect in the aforesaid class of locomotives; and to such end my invention consists, first, in the combination, in a locomotive in which the running wheels that rest upon the track are driven by frictional contact with elevated driving-wheels, of the steam-cylinders, the pistons, piston-rods, and pitmen with the elevated driving-wheels and the running wheels, interposed between the driving-wheels and the track, and connected together in pairs by connecting-rods, to prevent their slipping upon the track of the railway; second, in the combination, in a locomotive in which the running wheels that rest upon the track are driven by frictional contact with the elevated driving-wheel, of the elevated driving-wheel connections between said wheels and the piston, and a pair of running wheels connected together by connecting-rods, the said running wheels being in frictional contact with the driving-wheel, in the manner hereinafter stated; third, the combination, in a loco-

tive with the elevated driving-wheels actuated by the pistons through suitable connections, of the running wheels interposed between the driving-wheels and the track, said bearing-wheels being connected together by connecting-rods, to prevent slipping, and being provided with a larger and a smaller tread, the former of which rests upon the track and receives motion by the frictional contact of the latter with the driving-wheels, all as herein-after more fully explained.

In the accompanying drawings, which represent only such parts of a locomotive as are necessary to illustrate my invention, Figure I is a side elevation of a locomotive constructed to be driven in the manner hereinbefore mentioned. Fig. II is a like view, representing my invention in a modified form.

The steam cylinders and pistons and the truck-wheels of the locomotive may be of any approved or known construction, and therefore it is unnecessary to enter into any explanation of the same.

A refers to the elevated driving-wheels, one of which is, as a matter of course, secured upon each end of the driving-axle, it being only necessary, in illustrating my invention, to show one side of the locomotive. The usual axle-boxes will be provided for the driving-axle, and these boxes will be supported by a suitable frame-work, as at L.

B B indicate two running wheels, which bear and run upon the rail N, and which, as usual, are fixed to the respective axles. These wheels are each preferably formed with two treads, the larger of which, F, runs upon the rail, while the tread C, of smaller diameter, which is formed on one of the faces of the wheel, supports the elevated driving-wheel A. As shown in Fig. I, this driving-wheel is in contact with the treads of two of these running wheels, it being understood that the same arrangement is observed on the other side of the locomotive. The connecting-rods of the running wheels B are indicated by the letter D, and the connection of said running wheels, when taken in connection with the described means for imparting a rotary motion to the running or track wheels, constitutes the essential features of my invention. These running or track wheels B

are driven solely by frictional contact with the elevated driving-wheels A, and by connecting said running wheels together in pairs, in the manner set forth, the liability of said running wheels to slip on the track will be so lessened as to practically avoid such objectionable feature, which, if the running wheels are not so connected, will invariably occur.

By the arrangement of wheels described and shown in Fig. I, the driving-wheel has a double frictional contact with the track-wheels, which is a great advantage, inasmuch as less power is required to apply pressure for bringing the wheels in closer contact to prevent slippage, and the strain or impingement is better distributed, which results are largely in favor of the durability of the working parts of the locomotive. Besides, the driving-wheel is brought lower down, and hence the center of gravity of the driving-wheel with its axle and bearings are so much depressed as to add great stability to the locomotive when running at high speed or in rounding curves.

The principal weight of the boiler and frame depending from the axle of the elevated driving-wheels, it follows that the latter will keep in close frictional contact with the track-wheels, and the latter being joined by the connecting-bar, it is evident that I have a combination of the highest speed and efficiency attainable in this class of locomotives.

The frictional tire or rim of the wheels may be turned plain, curved, or in any form which shall best answer the ends of this invention. The distance apart of these running wheels will depend upon the class of work for which the locomotive is designed. If, for example, they are so set apart as to admit of the adjustment of the driving-wheel to some extent between them, the frictional bearing of the drivers upon the same will be greater, since the driver will be, in effect, wedged between the running wheels. It is not absolutely necessary, however, in carrying out my invention, that the driver should bear upon both of these running wheels, since an arrangement such as shown in Fig. II will be found effective. In this modification a driving-wheel bears upon one running wheel at each side of the loco-

tive, while said running wheel is connected by a connecting-rod with a second running wheel, arranged at about the usual distance in rear thereof. I prefer, however, arranging the running wheels in closer proximity, so that both will come in contact with the driving-wheel, since such arrangement facilitates the turning of curves in the road, in addition to the advantages heretofore stated.

What I claim is—

1. The combination, in a locomotive in which the running wheels that rest upon the track are driven by frictional contact with elevated driving-wheels, of the steam-cylinders, pistons, piston-rods, and pitmen with the elevated driving-wheels and the running wheels, interposed between the driving-wheels and the track, and connected together in pairs at the sides of the locomotive by connecting-rods, to prevent their slipping upon the track of the railway, substantially as described.

2. In a locomotive in which the running wheels that rest upon the track are driven by frictional contact with elevated driving-wheels, the combination of the elevated driving-wheels, connections between said wheels and the steam-piston, and two pairs of running wheels, connected by connecting-rods, the said running-wheels being in frictional contact with the driving-wheels, substantially as described.

3. The combination, in a locomotive with the elevated driving-wheels actuated by the pistons through suitable connections, of the running wheels interposed between the driving-wheels and the track, said running wheels being connected together by connecting-rods, to prevent slipping, and being provided with a larger and a smaller tread, the former of which rests upon the track and receives motion by the frictional contact of the latter with the driving-wheels, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CHARLES B. CLARK.

Witnesses:

WALTER S. HARSHA,
ROBT. A. LIGGETT.