

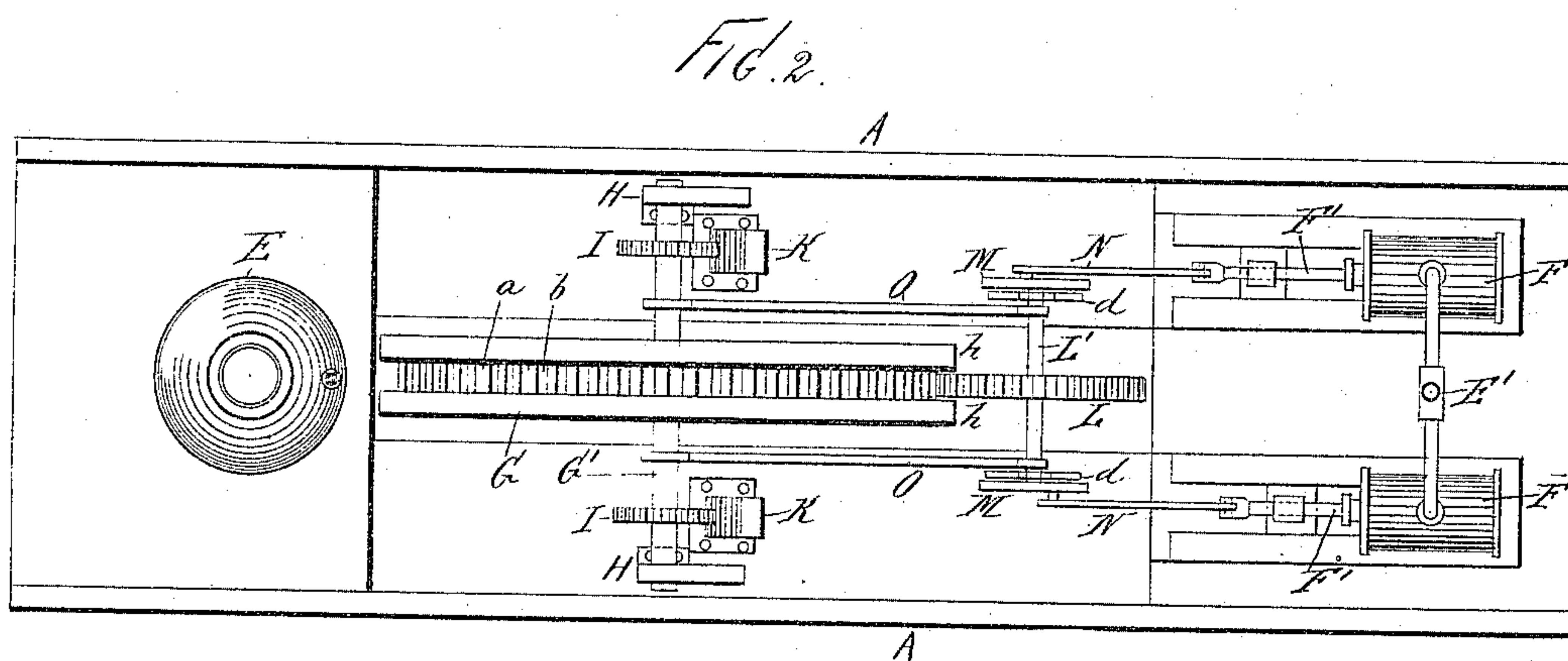
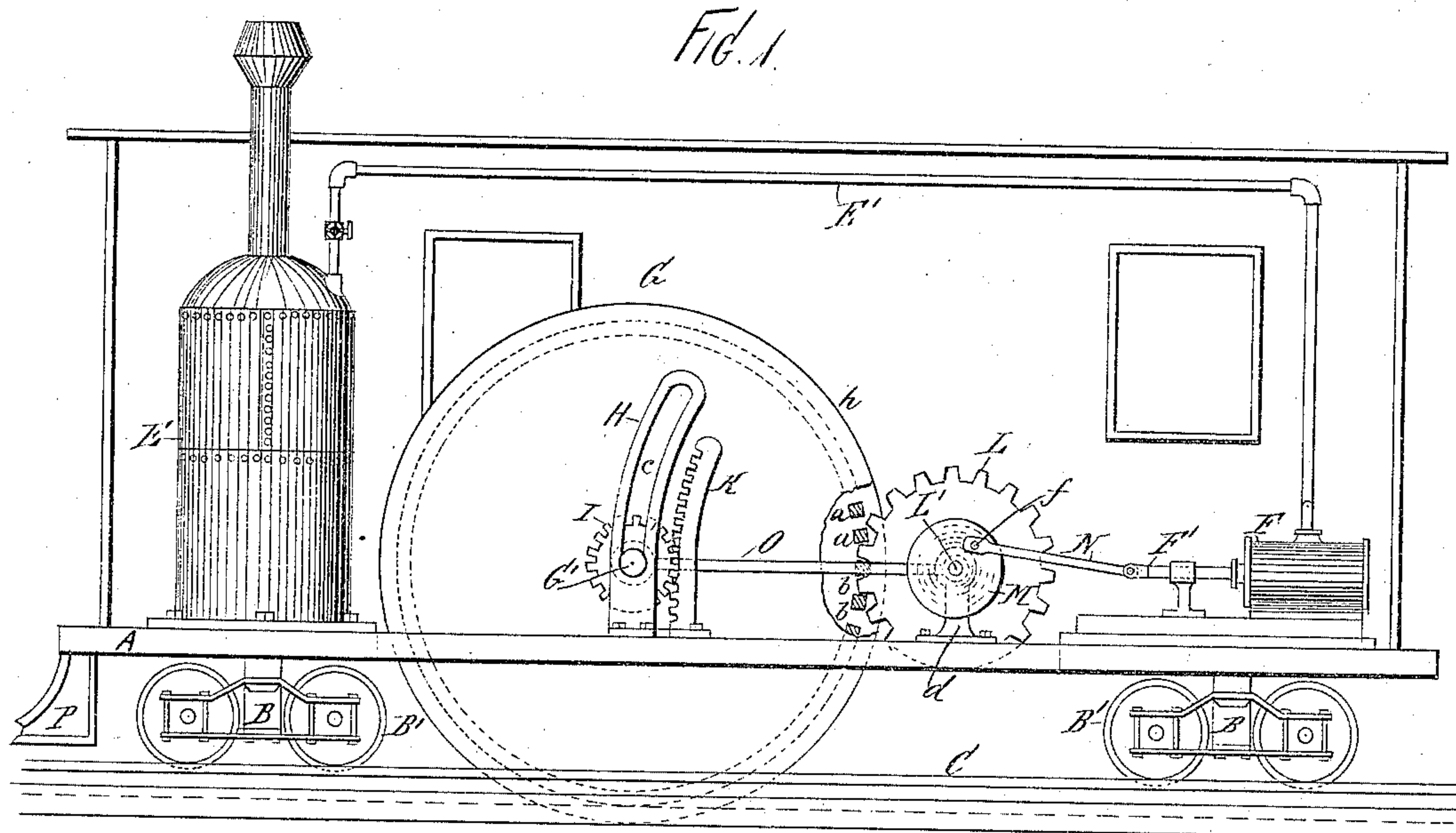
(No Model.)

M. W. HAZELTON.

TRACTION ENGINE.

No. 311,319.

Patented Jan. 27, 1885.



Witnesses:
John Buckle,
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Inventor,
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UNITED STATES PATENT OFFICE.

MILTON W. HAZELTON, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO
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TRACTION-ENGINE.

SPECIFICATION forming part of Letters Patent No. 311,319, dated January 27, 1885.

Application filed July 11, 1884. (No model.)

To all whom it may concern:

Be it known that I, MILTON W. HAZELTON, a citizen of the United States of North America, and a resident of the city, county, and State of New York, have invented a new and useful Improvement in Traction-Engines, of which the following is a specification.

It is well known that steam-engines or locomotives have been used for traction purposes on street or "surface" railroads, as they are called, and that they have failed of practical success for two obvious reasons: first, because an engine heavy enough for the work has been found too heavy for the light rails used on such roads, distorting, wearing, and displacing the rails very rapidly; and, secondly, because the wheels of the engine cannot obtain sufficient adhesion or friction on the rails when the latter have—as they usually do—mud, ice, or snow on them.

The object of this invention is to provide an improved traction or road engine for street-railroads that shall be free from these objections, and adapted to be operated successfully at all seasons and in all weathers.

The invention consists of an engine having, in addition to the wheels designed to run on the rails, a large, preferably central, traction-wheel of peculiar construction, adapted to run on the road-bed between the rails, and to be the sole medium for receiving and conveying the power of the engine; and it further consists of novel devices for supporting, guiding, and controlling the said traction-wheel, all of which will be hereinafter set forth.

Figure 1 represents a side elevation of my improved device with parts removed to exhibit other parts. Fig. 2 is a plan of the same with parts removed.

A A represent the sill-timbers of the engine-frame, which is supported on tracks B of the ordinary kind, whose wheels B' are designed, when the device is in place for operation, to run on the ordinary street-car track or rails, (represented at C.) On the front end of the engine-frame is secured a boiler, E, for furnishing the motive power. From the boiler E a steam-pipe, E', extends rearward and makes connection with two engine-cylinders, F F, that

are suitably secured on the rear end of the engine-frame, as indicated. The driving or traction wheel represented at G is designed to be, for an engine adapted for this purpose, about eight feet in diameter, with a twelve-inch face. Centrally all around the periphery of said wheel for a space of about four inches in width the rim is recessed or sunken, as shown, to the depth of, say, four or five inches, so that the solid portions *h h* of the periphery of the wheel project four or five inches (more or less) on either side of the sunken portion and form the actual tread of the wheel, and in this sunken portion alternate teeth *a* and mortises *b* are formed, the latter extending entirely through the wheel-rim, as shown in Fig. 1; hence it will be seen that the teeth *a* and mortises *b* are but little liable to become clogged with mud, &c. This driving-wheel G is provided with an axle, G', whose ends are journaled in the curved slots *c* of two guide-posts, H, which are secured opposite each other on the frame-sills, as shown, and extend upward with a slight rearward curve, in order to permit the free rise and fall of said wheel G as it passes over stones and other obstructions. This wheel G extends down through the floor of the engine-frame and rests on the road-bed between the track-rails. On the axle G' are also fixed two pinions, I I, which gear into upright curved racks K K, that are also secured on the frame-sills opposite each other. The purpose of these pinions and racks is to assure the equal and synchronous rise and fall of both ends of the axle G' when the wheel G meets with an obstruction.

Between the wheel G and the location of the engine-cylinders F F is a cog-wheel, L, whose shaft L' is journaled in suitable pillow-blocks, *d*, that are secured on the floor of the engine-frame, and on the ends of said shaft L' are fixed crank-disks M, from whose wrist-pins *f* pitmen N extend rearward and make connection with the piston-rods F' F' of the engine-cylinders. Two connecting-rods, O O, having eyed ends, extending from axle G' to shaft L' and embracing both, assist in holding the teeth of the cog-wheel L always in gear with those of the wheel G, the teeth of the cog-wheel L be-

ing designed to be long enough to extend entirely through the mortises *b* of the wheel *G*, so as to force from them inwardly the mud, snow, or other obstructions that may become engaged in them when the device is in operation on a road. These rods *O O* also serve as the sole media through which the power or pull of the traction-wheel *G* is transmitted to the engine. The solid portions *h h* of the periphery of the wheel *G*, on either side of the line of teeth or mortises, also serve to hold the two wheels *G F* in gear against lateral movement of either. The device being in operation, the revolutions of the cog-wheel *L* cause the driving-wheel *G* to revolve with its tread or rims *h h* on the road-bed, and to pull the engine along by means of the connecting-rods *O O*, the said wheel *G* being free to rise and fall over obstructions, as hereinbefore set forth.

The peculiar construction of the traction or driving wheel, whereby its teeth can be kept free from mud, snow, and ice, and always in good operative condition, its great diameter, and its width of tread, obviously give it great advantages as a traction-wheel.

On the front of the engine-frame is fixed a cow-catcher, *P*, of usual construction, designed to push aside obstructions from the road-bed or track.

The traction-wheel *G* is designed to be of sufficient weight to secure proper frictional contact with the road-bed, for the purpose of drawing the engine, of which it is an integral part, and as its weight does not come on the track-rails the latter have only to support the engine-frame, the boiler, and the mechanism transmitting power to the traction-wheel, which frame, boiler, &c., are designed to be constructed so as not to weigh more than an ordinary passenger-loaded street-car.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a traction or road engine adapted es-

pecially for street-railroads, and provided with wheels for running on the track-rails, as a means for applying the motive power of the engine, the combination, with suitable gears and connected mechanisms movable by the piston-rods of the engine-cylinders, of a traction-wheel located about centrally of the engine-frame, with its axle adjustably journaled above the frame-sills, so as to rise and fall with the wheel as the latter passes over obstructions, and its tread resting on the road-bed between the rails, as set forth.

2. In a traction or road engine, the combination, with a traction-wheel, as *G*, and axle, as *G'*, of guide-posts, as *H*, secured on the engine-frame, and having curved slots, as *c*, substantially as herein shown and described, said slotted guide-posts being designed to support the said wheel and its axle, and to permit the free rise and fall thereof over obstacles, as set forth.

3. In a traction or road engine, as a means for assuring the equal and synchronous rise and fall of both ends of the traction-wheel axle when said axle is free to rise and fall as the wheel passes over obstructions, the combination, with the said axle, of pinions, as *I I*, and curved racks, as *K K*, all arranged substantially as set forth.

4. In a traction or road engine, a traction-wheel, as *G*, constructed with alternate sunken peripheral teeth and mortises *a b*, the latter extending entirely through the rim of the wheel, and projecting side rims or treads, *h h*, substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in the presence of two witnesses, this 4th day of June, 1884.

MILTON W. HAZELTON.

Witnesses:

JACOB J. STORER,

ALBERT P. MORIARTY.