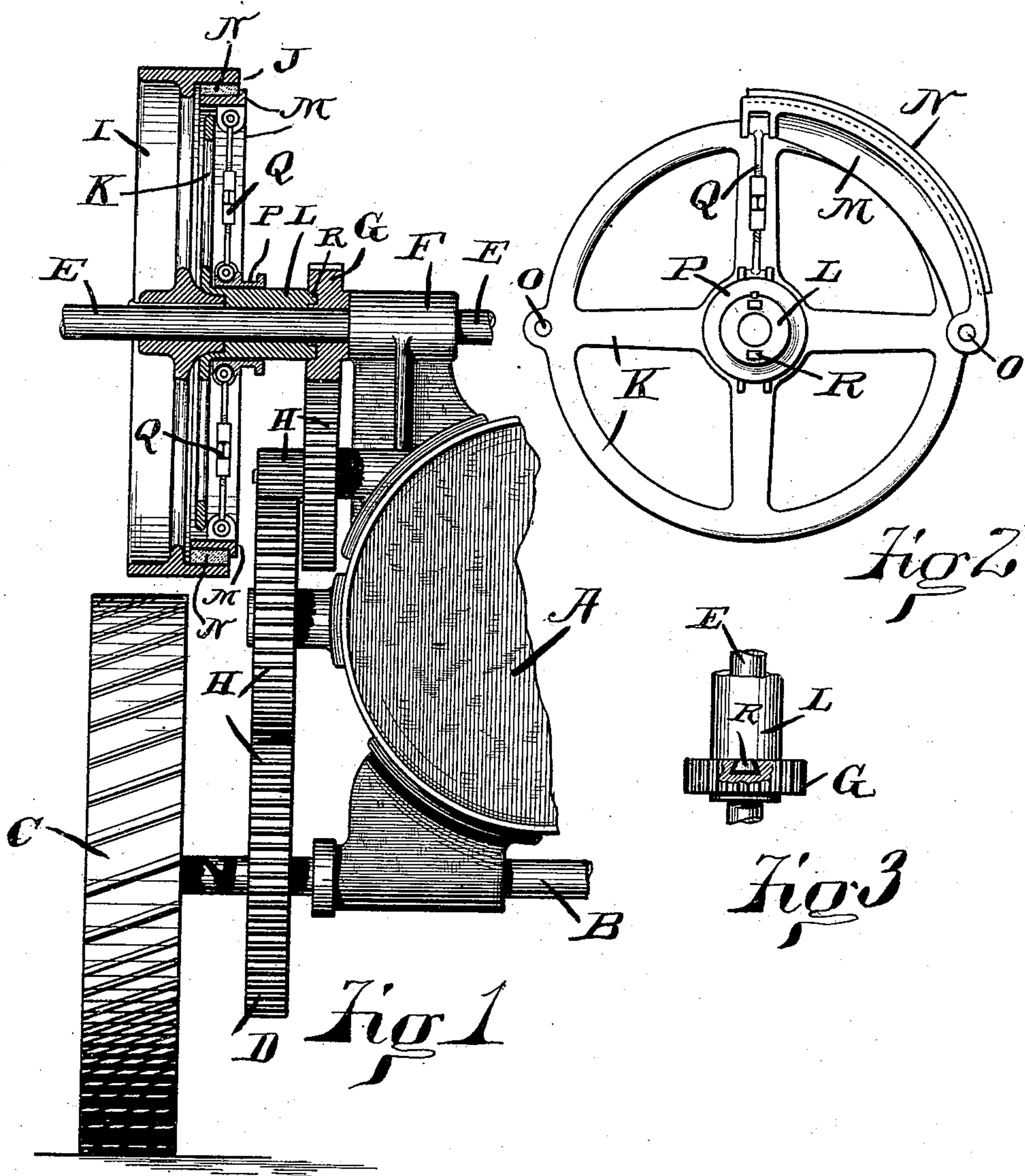


(No Model.)

C. M. GIDDINGS.  
TRACTION ENGINE.

No. 330,576.

Patented Nov. 17, 1885.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

CHARLES M. GIDDINGS, OF MASSILLON, OHIO.

## TRACTION-ENGINE.

SPECIFICATION forming part of Letters Patent No. 330,576, dated November 17, 1885.

Application filed September 22, 1884. Serial No. 143,617. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES M. GIDDINGS, of Massillon, Stark county, Ohio, have invented certain new and useful Improvements in Traction-Engines, of which the following is a specification.

This invention pertains to traction-engines in which a friction-clutch is employed in the mechanism transmitting motion from the engine-shaft to the traction-axle, and relates particularly to the arrangement and construction of parts, as hereinafter more distinctly pointed out.

The invention will be understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is an end view of part of a traction-engine embodying my improvements, portions of the view being a vertical section through the axis of the crank-shaft of the motor; Fig. 2, a face view of the clutch-spider with one shoe and holder attached; and Fig. 3, a plan of the hub of the clutch-spider and of the motor-pinion, a portion of the latter being broken away to exhibit in section the means for connecting the two.

In the drawings, A represents the boiler of a traction-engine; B, the traction-axle of the engine, carried in suitable bearings, as usual; C, one of the traction-wheels, secured to the axle; D, a gear fast upon the traction-axle; E, the crank-shaft of the steam-engine or the main shaft of the motor, whether the motor be an engine of the crank type or not; F, one of the bearings of the motor-shaft E; G, a pinion loose upon the motor-shaft; H, a train of gearing adapted to transmit rotary motion from the pinion G to the axle-gear D; I, a fly-wheel fast upon the motor-shaft; J, a portion of the rim of the same, bored so as to present a true interior surface; K, a clutch-spider located within the bored portion of the fly-wheel and fitted to be free upon the motor-shaft; L, the hub of the clutch-spider, formed solid with the clutch-spider, loose upon the motor-shaft, and rigidly connected with the motor-pinion G; M, a pair of segmental shoe-holders pivoted to the clutch-spider, as indicated in Fig. 2; N, wooden shoes held one in each shoe-holder, and having a peripheral surface fitting the interior of the bored portion of the fly-wheel; O, the pivots connecting

the shoe-holders with the spider; P, a collar sliding longitudinally upon the hub of the spider and adapted to be operated by an ordinary clutch-shifting device; Q, toggle-rods pivoted to ears formed upon the sliding collar and upon the free end of the shoe-holders, and R dovetail projections cast upon the face of the hub of the spider and babbitted into dovetail recesses cast in the contiguous face of the motor-pinion G.

The sliding collar, with its rods, forms a toggle system. When the collar is moved to the right, viewed as in Fig. 1, the toggle becomes shortened and the shoes drawn inward. In this condition the motor-shaft, with its fly-wheel, may be revolved, while the clutch-spider, with all of the transmitting-gearing and traction apparatus, remains motionless. When the collar is moved to the left, the shoes are pressed forcibly against the rim of the fly-wheel, and the effect is to lock the motor-pinion to the fly-wheel. Under such conditions rotary motion is transmitted from the motor-shaft to the traction apparatus. The shoes N, being of wood, are somewhat elastic. This elasticity permits the sliding collar to be pushed to the left a trifle past the center of oscillation of the toggle-rods, in which position the toggle system remains self-locked. In moving the sliding collar to the left the pressure with which the shoes engage the fly-wheel is under perfect control, and this pressure may be so controlled as to permit a certain degree of slippage between the wheel and shoes, whereby a portion only of the rotary motion of the fly-wheel is transmitted to the spider. The result of this arrangement is that the motor-shaft E, running at a constant speed, may be caused to transmit a variety of speeds to the traction apparatus. When the machine, as a locomotor, is standing still, the motor-shaft and the fly-wheel may be gotten under full headway, and the speed of the same may even be made excessive. The friction-clutch may now be thrown into action and the motion transmitted to the traction apparatus without shock. By this means the momentum of the fly-wheel is made available in starting the locomotor, and by this means I am enabled to start a load which the engine is incapable of steadily pulling. In practice I find that I can start nearly



double the load permissible by other means. The device also permits the use of much lighter transmitting-gearing than usual, owing to the lack of shock in the initial transmission.

5 By utilizing the momentum of the fly-wheel in the manner referred to I am enabled to work over a hard spot in the road, moving two or three or four feet at a time. By "hard spot" I mean a spot which the engine, as a  
10 steady pulling contrivance, would be capable of pulling over. This device enables me to choose an engine adapted for an ordinary every-day range of work, and at the same time have in reserve an availability for overcoming incidental obstacles calling for an extra-  
15 ordinary effort.

The pivoted shoe-holders render available a large clutching area, and permit of exceedingly cheap construction. The toggle-rods  
20 are adjustable in length by right and left nuts, as shown. The sliding collar, which acts as an abutment for the toggle-rods, does not fit snugly upon the hub of the spider. On the contrary, it is bored to have a looseness of  
25 about one eighth of an inch, whereby the collar is at liberty to adjust itself and compensate for any slight inequality in the length of the two rods. By this means I am sure of an equally forcible contact at each shoe. It should  
30 be observed that what I call the "spider" is merely an element for furnishing the two oppositely-disposed pivot-supports for the shoe-holders. The annular rim joining the pivot-points adds strength to these supports.

35 When the parts are assembled in working condition, the motor-pinion G forms an integral part of the spider, and in order to permit the placing in position of the sliding collar P, I have devised a peculiar method of uniting the  
40 motor-pinion to the hub. On the end of the

hub I cast the dovetail projections R, and in the contiguous face of the pinion I cast dovetail recesses, in which these projections may freely enter. After placing the sliding collar  
45 upon the hub I put the pinion in place against the end of the hub, with the projections and recesses in engagement. I then pour Babbitt metal or similar material into the vacant spaces of the recesses, whereby the pinion and  
50 hub become rigidly joined.

The traction apparatus is to be provided, preferably, with the usual compensating device; and the transmitting-gearing may be of the toothed variety, as indicated, or it may be chain-gearing or worm-gearing.  
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Broadly, the motor-pinion G is to be considered as the element of initial transmission, whether that pinion be a toothed spur-gear, as indicated, or otherwise.

I claim as my invention—  
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1. The combination, with the shaft, the fly-wheel, and hub, of the collar P, the shoe-supports, the shoes, and rods Q, all of the above parts combined and adapted to operate as described.  
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2. The combination, with a traction-axle, intermediate gearing, the motor-shaft E, and fly-wheel I, fast thereon, of the hub L and pinion G, united by the projections R upon the hub, babbitted into recesses in the pinion, substantially as and for the purposes set forth.  
70

3. In a traction-engine, the combination of fly-wheel I with bored portion J, hub L, collar P, fitted to slide and to shift transversely on said hub, shoes J, and rods Q, substantially  
75 as and for the purpose set forth.

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