(No Model.)

C. M. GIDDINGS.

WHEEL FOR TRACTION ENGINES.

No. 326,109. Patented Sept. 15, 1885.

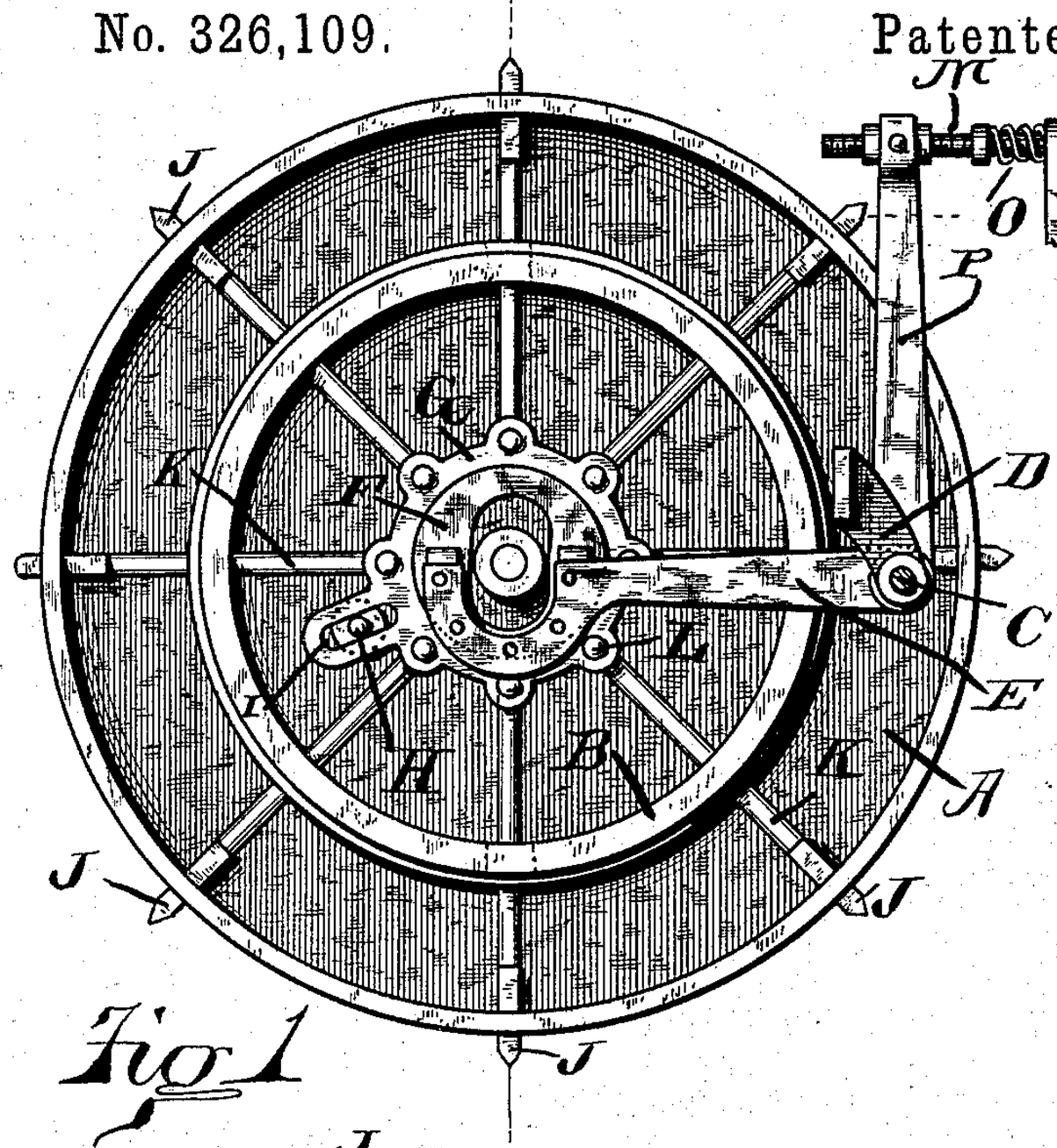

Fig 1

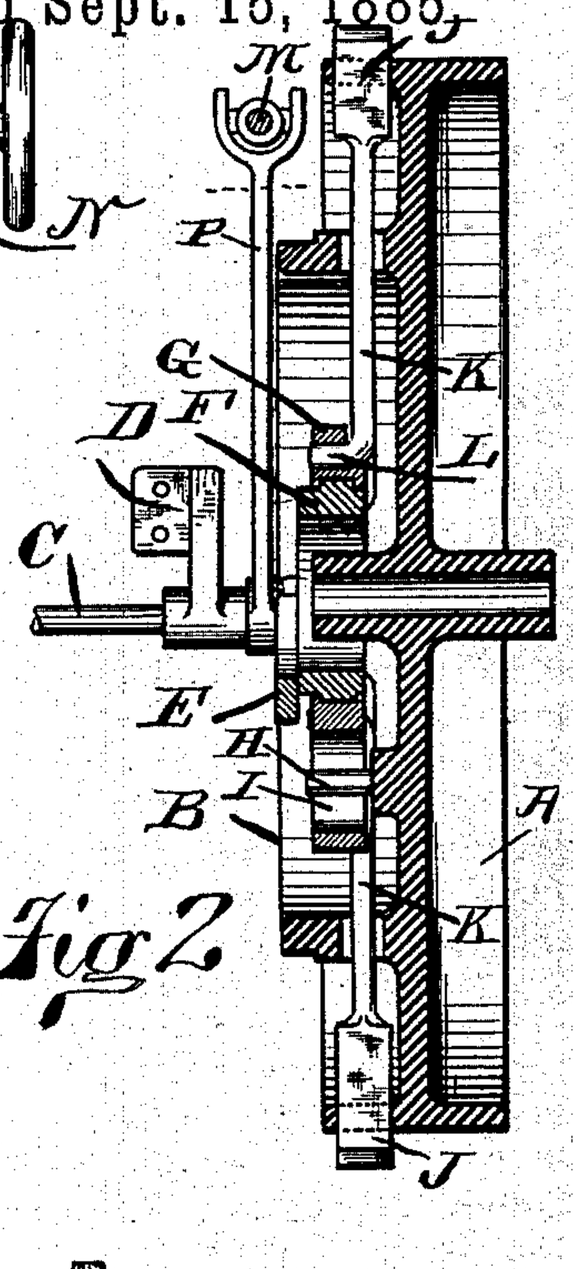

Fig 2

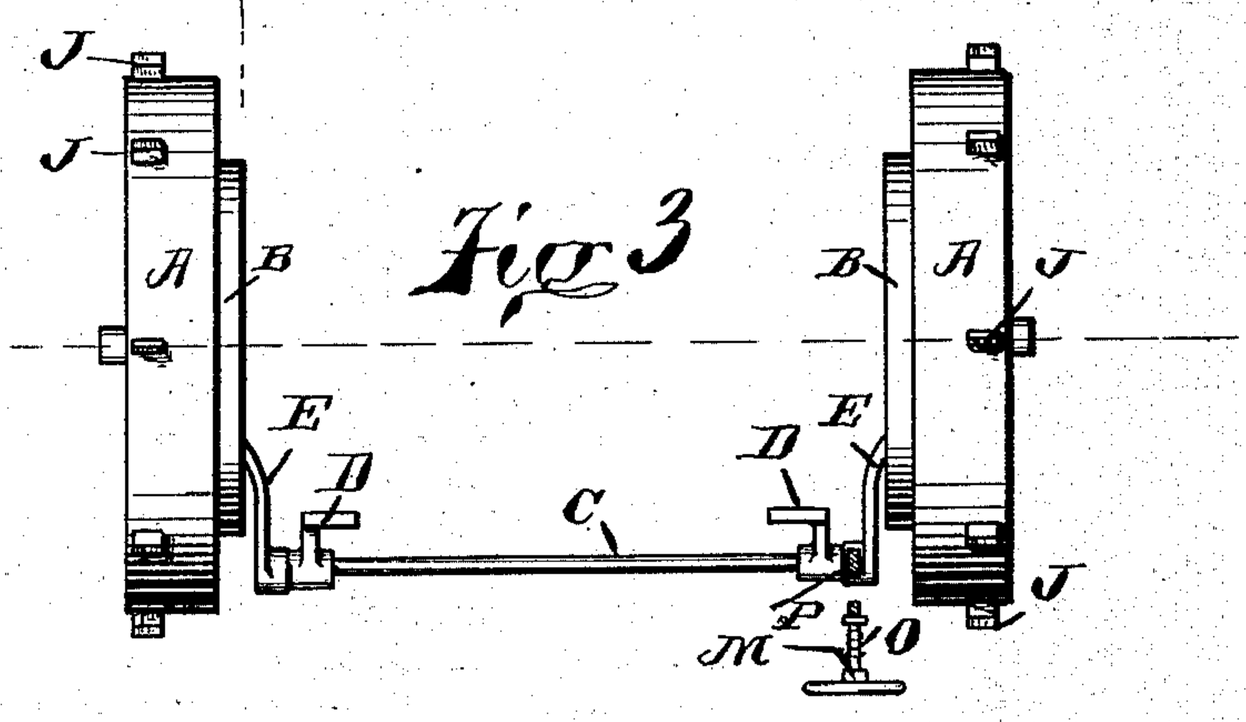

Fig 3

Witnesses:
L. C. Overbeck
C. E. Doty

Charles M. Giddings
by James N. See
Inventor
Attorney

UNITED STATES PATENT OFFICE.

CHARLES M. GIDDINGS, OF MASSILLON, OHIO.

WHEEL FOR TRACTION-ENGINES.

SPECIFICATION forming part of Letters Patent No. 326,109, dated September 15, 1885.

Application filed September 22, 1884. (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; and it relates particularly to means for increasing the tractive power of the wheels.

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

Figure 1 is a view of the inside face of one of the traction-wheels of a traction-engine illustrating my invention; Fig. 2, a vertical transverse section of the same, and Fig. 3 a plan of a pair of wheels illustrating the manner of connecting the traction-aiding mechanism of the two.

In the drawings, A represents a traction-wheel of a traction-engine, (shown as of plate or web construction, but which may be of skeleton or spoke type;) B, the usual seat for receiving the toothed or sprocketed rim by which the wheel receives its rotary motion from its motor; C, a tumbling-shaft arranged parallel to the axis of the two wheels of a pair; D, bearings for the tumbling-shaft, adapted to be secured against the boiler of the traction-engine; E, levers rigidly secured to the tumbling-shaft and projecting toward the center of the wheels, the levers being offset, as shown, if necessary, in order to permit the inner ends to reach sidewise within the seat B, or the tire of the wheel, if desired; F, an eccentric rigidly secured to the end of the lever E in a position such that the axes of the traction-wheel will coincide with the arc swept by the center of the eccentric as the lever E is oscillated, the eccentric being non-rotary, and there being one for each traction-wheel; G, an eccentric-strap, of which there is to be one at each eccentric; H, a driving-stud projecting from the wheel and engaging with the eccentric-strap, the stud being parallel with the axis of the traction-wheel; I, a slotted lug formed with the eccentric-strap and engaged by the driving stud; J, a series of flukes adapted to reciprocate through mortises in the wheel-tire, and having terminations of a form adapted to engage with soil or road-bed; K, fluke-rods forming inward prolongations of the flukes toward the eccentric-straps, to which they connect; L, pivots connecting the inner ends of the fluke-rods to the eccentric-straps, the eccentric-straps being provided with pivot-holes to receive them, and the pivots being retained in place by riveting, as shown, or, if desired, by nuts or keeper-pins or other means; M, a hand-screw; N, a bearing for the hand-screw, adapted to be rigidly secured to the boiler or some other rigid part of the traction-engine; O, a spring upon the hand-screw, engaging between the bearing M and a collar rigidly secured to the hand-screw, and P a lever rigidly secured to the tumbling-shaft, and having its free end engaged by the hand-screw through the intermediacy of a swivel-nut, as shown.

Each of the two wheels is similarly fitted with an eccentric, strap, flukes, and driving-stud, and the shaft C, with its two levers, E, serves to operate both eccentrics simultaneously, the lever P being preferably secured to the shaft C at one of its ends, where it receives one of the levers E, as clearly indicated in Fig. 3. The eccentrics are supported solely by the levers E, and as these levers are oscillated the eccentrics will take a position above or below the center of the traction-wheels. In the drawings the eccentric is shown in its concentric position. The eccentric is slotted, in order that its rising and falling movement may be unimpeded by the traction-axle.

It is obvious that by manipulating the hand-screw the eccentric may be adjusted into various fixed positions upon an arc struck from the center of the tumbling-shaft. As the traction-wheels revolve the eccentrics stand still; but the eccentric-straps revolve with the wheels, being carried around by the driving-studs. With the eccentrics set concentrically, as shown in Fig. 1, the flukes will project uniformly and unvaryingly during the revolution of the traction-wheels. If, now, the hand-screw be adjusted so as to elevate the eccentrics a certain distance, it is obvious that the lower fluke will be withdrawn radially until it no longer projects through the wheel-tire, and that the upper fluke will have its projection increased, and that the other flukes will have their pro-

jections through the tire more or less modified.

It follows that, with the eccentrics thus adjusted, as the wheel revolves in either direction, that point of its periphery in contact with the ground will be free from any projecting flukes, and that the flukes will idly project from those portions of the wheel not in contact with the ground, and that any given fluke will have its greatest projection at the top of the wheel, and, as it moves around toward the contact-point, will gradually withdraw until it has no projection. The eccentric thus set suppresses the flukes so far as the roadway is concerned, and causes the wheel to be a smooth wheel suited for use upon bridges and other road-beds of similar character of surface. If, now, the eccentrics be adjusted into a position below the center of the traction-wheel, the operation of the flukes will be exactly the reverse of that above indicated. The flukes will have their greatest projection below, at the point where the wheel makes contact with the ground, and their least projections at the top of the wheel. As the wheel moves forward, a fluke, projecting a little or none at the top of the wheel, will gradually increase its projection, take a firm hold of the roadway, maintain that hold until this fluke falls behind the point of contact with the ground, and then be gradually withdrawn, and so on with each fluke as the wheel revolves. In practice the parts are so arranged that the wheel may be operated as a smooth wheel—that is, with no fluke projection below—or as a wheel having a fluke projection of four or five inches adapted for plowed ground.

It is obvious that, as the traction wheel revolves upon one axis and the eccentric-strap upon another axis, the fluke-rods are thrown into greater or less oscillation upon their pivots, where they attach to the eccentric-straps. The pivotal attachment of the rods to the eccentric-straps permits of this oscillation, and the fit of the flukes in the tire-mortises, and through any other features of the wheel through which they have to pass, must be of such looseness of character as not to interfere with this oscillation. It is also obvious that as the wheels and eccentric-straps revolve upon different axes, the driving-stud H occupies a varying position with reference to the eccentric center as the eccentric-strap is carried around, and that the eccentric-strap partakes of an oscillation upon the driving-stud as a fixed point; hence the eccentric must be free to yield radially upon the driving-stud, and also to oscillate upon it.

It is not desirable that the flukes should be unyielding in their projections from the tire, for the reason that the flukes are liable to get into contact with surfaces which they are incapable of penetrating—such, for instance, as stone—and an unyielding fluke thus striking an unimpenetrable object would tend to lift the wheel bodily.

I endow the projection of all of the flukes with a certain degree of elasticity by means of a single spring, O, arranged upon the hand-screw. It will at once be seen that a force applied upward to the lower projection of the fluke of the wheel will tend to lift the eccentric, the spring O serving as the elastic resistance.

In Fig. 2 the fluke-rods are shown as lying parallel with plate of the wheel. This is the obvious arrangement where the wheel is of the plate-type; but most traction-engine wheels are of skeleton or spoke structure, with the spokes diverging to the hub. The spokes, thus separating at the hub, would interfere with an eccentric being placed so far within the wheel as is indicated in Fig. 2. In such case I locate the eccentric as far inward as it may conveniently be, and I then arrange the fluke-rods angularly, reaching from the flukes to the eccentric strap, precisely as if the eccentric and strap in Fig. 2 were bodily moved some distance to the left. In practice I find no established form of wheel-construction which will not permit of the application of my present invention.

It should be understood, of course, that, if desired, the tires of the traction-wheels, instead of being entirely smooth, may be provided with the usual cleatings in order to give a fair traction-hold upon ordinary roadway-surfaces independent of the flukes; and it should also be understood that my present invention does not in any way interfere with the employment of any of the ordinary forms of compensating-gearing for permitting the independent rotation of the two wheels.

I claim as my invention—

1. In a traction-engine, a pair of traction-wheels, a tumbling-shaft, levers secured to the tumbling-shaft, eccentrics rigidly secured to the levers, eccentric-straps, yielding-drivers connecting the driving-wheels with the eccentric-straps, sliding flukes connected pivotally to the eccentric-straps, and an adjusting screw and lever for adjusting and actuating the tumbling-shaft, combined substantially as and for the purpose set forth.

2. In a traction-wheel, the combination, with flukes, eccentric-straps, eccentrics, and adjusting-levers and adjusting-screw, of the spring O, substantially as and for the purpose set forth.

CHARLES M. GIDDINGS.

Witnesses:
FELIX R. SHIPLEY,
JAMES PEACOCK.