(No Model.) 4 Sheets—Sheet 1.

N. W. BUSHNELL.

TRACTION ENGINE.

No. 259,814. Patented June 20, 1882.

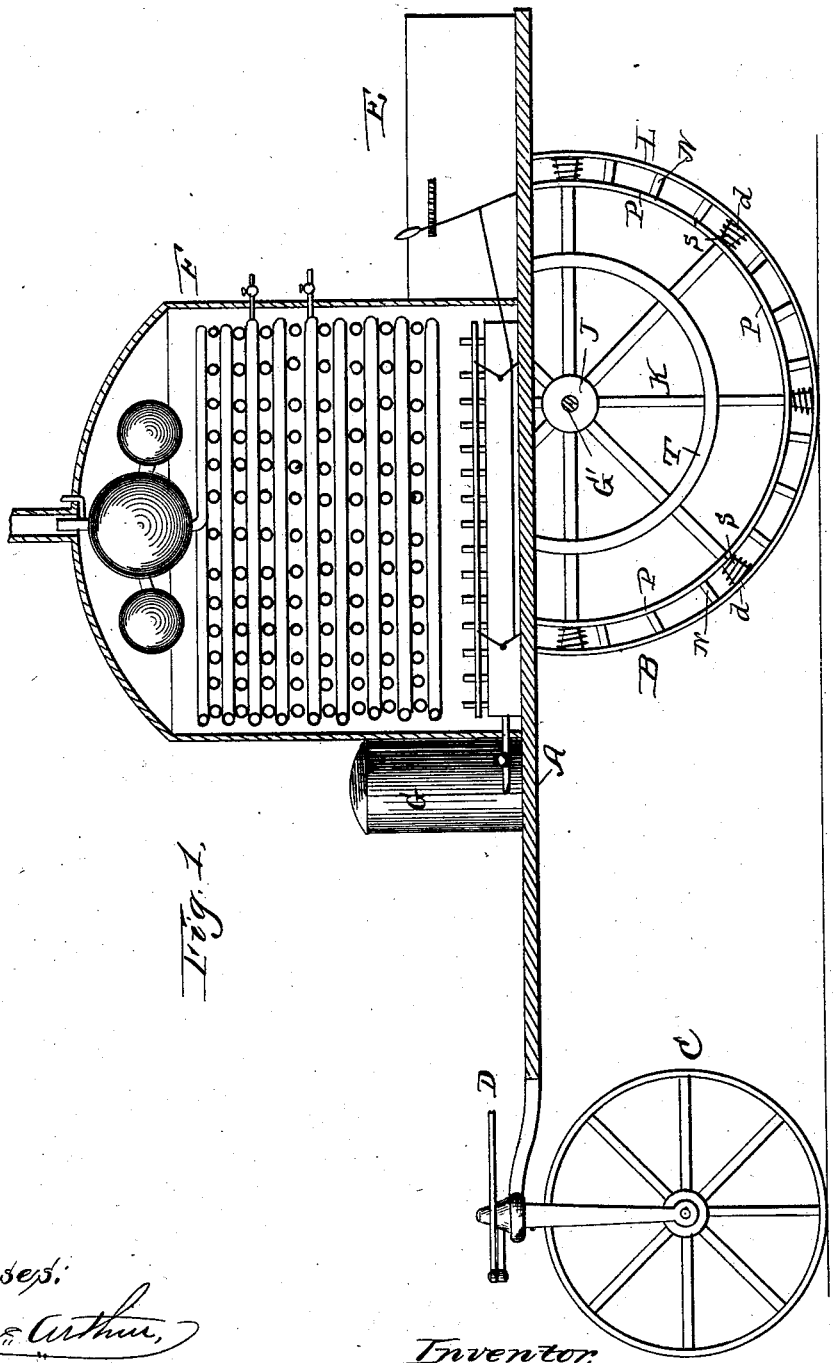

Fig. 1.

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W. R. Keyworth

Inventor:
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per
Thos. Alexander
Attorney.

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N. W. BUSHNELL.

TRACTION ENGINE.

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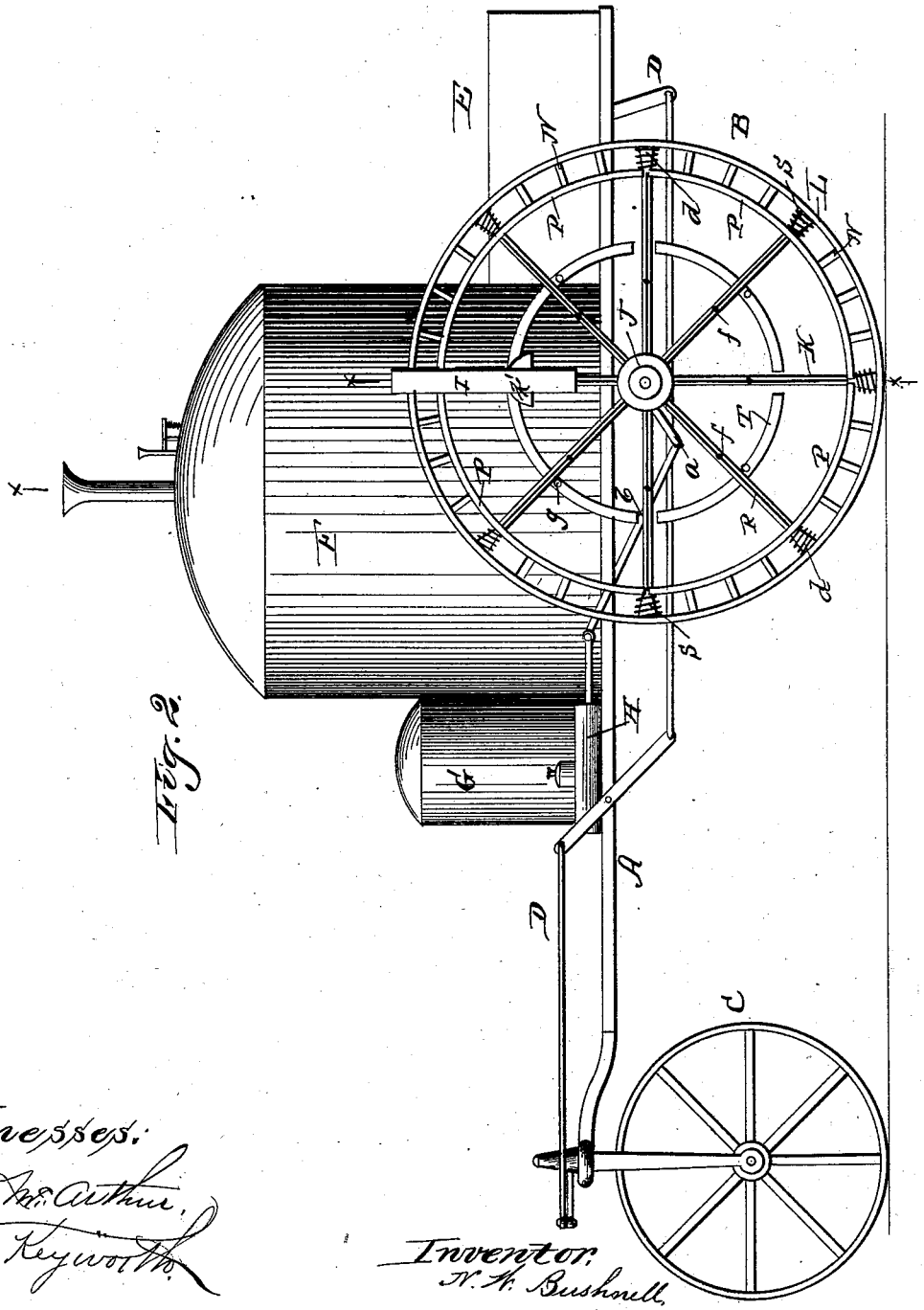

Fig. 2.

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N. W. BUSHNELL.

TRACTION ENGINE.

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Fig. 3.

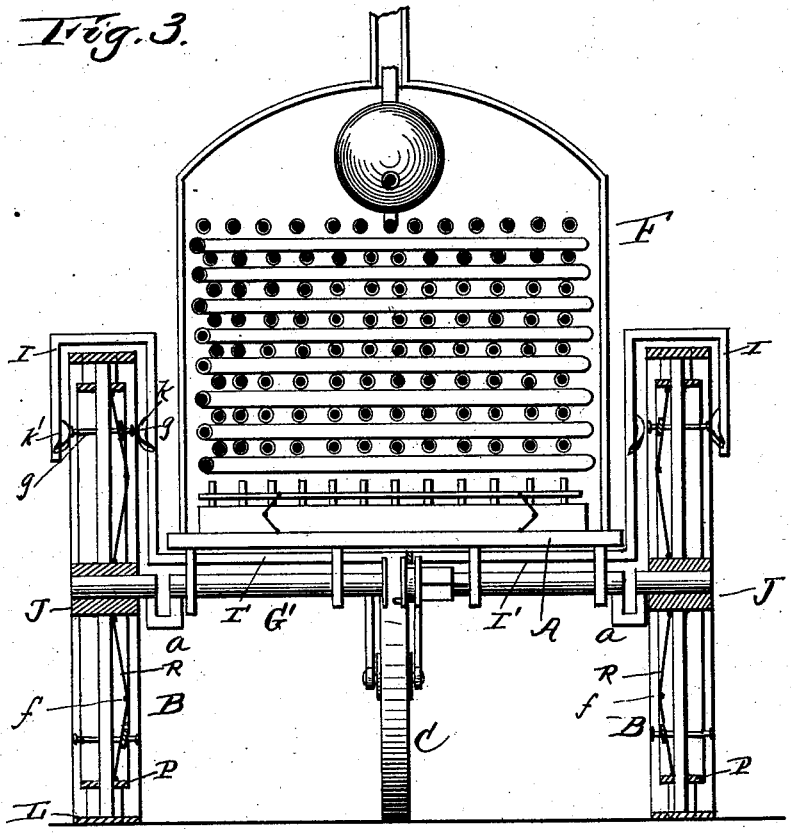
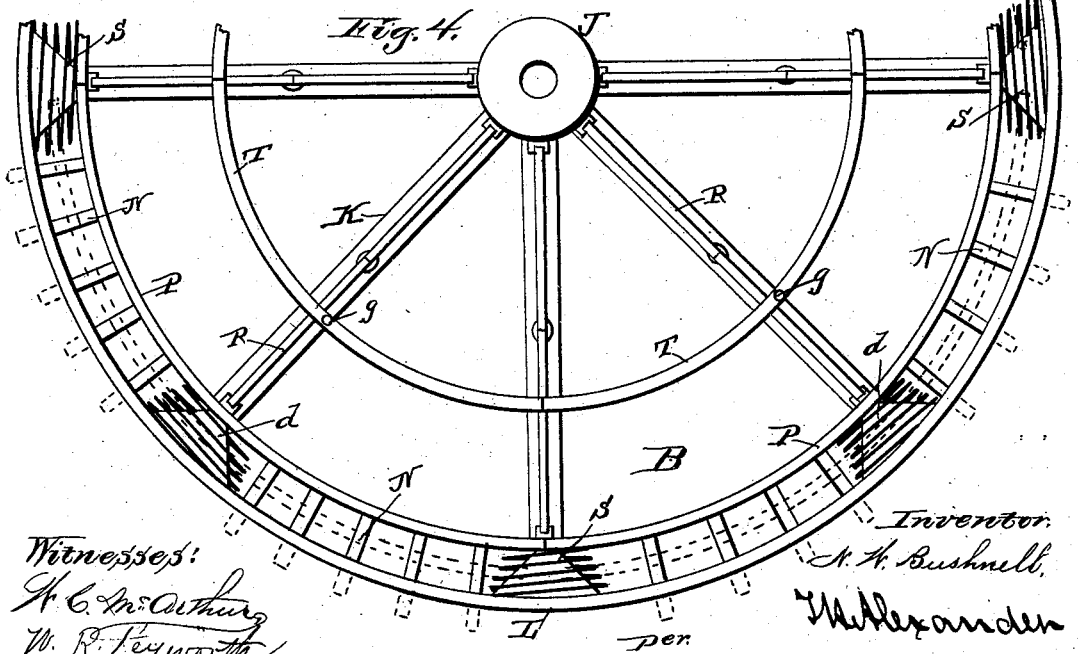


Fig. 4.



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(No Model.) 4 Sheets—Sheet 4.

N. W. BUSHNELL.

TRACTION ENGINE.

No. 259,814. Patented June 20, 1882.

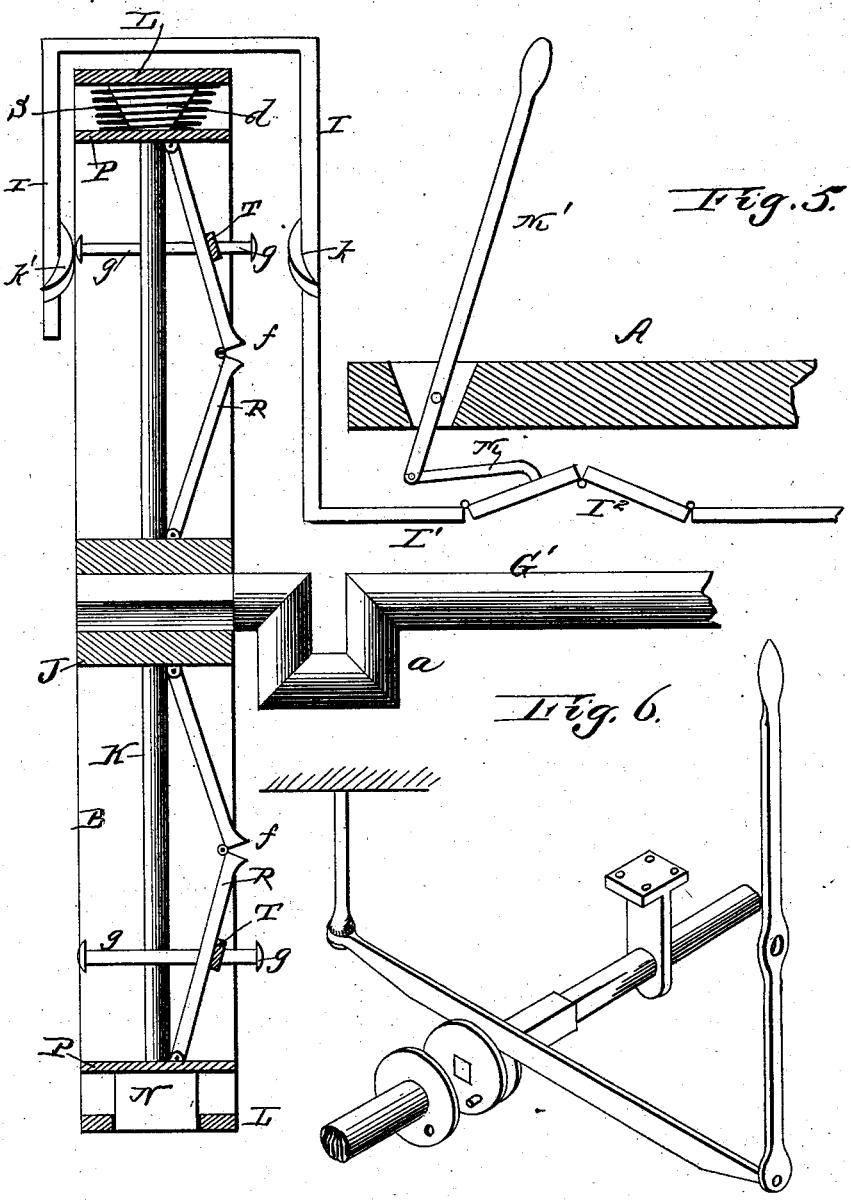

Fig. 5.

Fig. 6.

Witnesses:
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per W. Alexander
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UNITED STATES PATENT OFFICE.

NEWTON W. BUSHNELL, OF NINEVEH, NEW YORK.

TRACTION-ENGINE.

SPECIFICATION forming part of Letters Patent No. 259,814, dated June 20, 1882.

Application filed February 14, 1882. (No model.)

To all whom it may concern:

Be it known that I, NEWTON W. BUSHNELL, of Nineveh, in the county of Broome and State of New York, have invented certain new and useful Improvements in Traction-Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

This invention relates to what are denominated "road" or "traction" engines; and the nature of my improvement on such engines consists mainly in the construction of the driving and transporting wheels, whereby cogs or traction-teeth can be protruded or retracted from the rims thereof at the pleasure of the attendant.

When the machine is moving on macadamized roads, over bridges, and hard and level fields smooth-faced wheels are desirable; but when the machine is used for drawing heavy loads—as, for example, harvesters or plows in the field—it is necessary to protrude cogs or spurs from the rims of the transporting-wheels to prevent them from slipping while drawing on loose or soft ground.

In the annexed drawings, Figure 1 is a vertical section taken longitudinally through the new engine. Fig. 2 is a side elevation of the same. Fig. 3 is a vertical transverse section taken in the course of the dotted lines *x x* marked on Fig. 2. Fig. 4 is a side view, enlarged, of one of the driving and transporting wheels, indicating by dotted lines the traction-cogs protruded from the rim and by full lines the same cogs retracted within the perimeter of the rim. Fig. 5 is a diametrical section through the wheel represented by Fig. 4.

Similar letters of reference indicate corresponding parts.

A designates the frame or platform of the traction-engine, which may be made in any suitable manner, and B B C designate the transporting-wheels thereof. The two wheels B B are traction and driving wheels, and the wheel C, which supports the front of the frame A, is a guide, and it may be controlled by means of connecting-rods D, leading back to the engineer's station, which I have indicated by the letter E.

F designates the steam-boiler; G, an oil-tank; H H, steam-engines of the well-known kind, whose piston-rods connect with cranks *a a* on the axle G′ of the transporting-wheels by means of pitman-rods *b b*.

On opposite sides of the engineer's station water-tanks are arranged, and at the rear end of the frame or platform A, I provide suitable means for coupling with a harvester, a plow, or other implement. The axle of the front or guide-wheel, C, has its bearings in a furcated yoke, which is free to swivel in a goose-neck projecting from the front of frame A.

The boiler F is preferably composed of tubes inclosed within a boiler-iron case and heated by means of oil in a tank from which rise a number of wick-tubes. A perforated diaphragm having tubular slides fixed to it is employed, which slides receive through them the wick-tubes. The slides are vertically slotted and allow the use of set-screws, which clamp the wicks after they have been properly adjusted. The said perforated diaphragm is vertically adjustable by means of knee-levers and a connecting-rod extending through the boiler-shell and pivoted to a hand-lever outside thereof. A segment-rack outside of the boiler may be employed for holding the said hand-lever at any desired point of adjustment.

An oil-feeder provided with a suitable cut-off will be connected to the tank G. It will be seen that I use fluid fuel for the boiler and that I can regulate the intensity of the heat of the many flames by the adjustment of the single hand-lever.

Instead of the boiler above described any other suitable steam-generator may be used.

The driving and transporting wheels B B may be fixed on one axle, G′; or they may be fixed on a centrally-divided axle, so that each wheel may turn independently of the other while turning curves. If the axle is centrally divided, a suitable clutching device will be used, by means of which the two sections of the axle can be locked together or unlocked at the will of the attendant.

Each driving and transporting wheel B is constructed as follows:

J designates the hub of the wheel; K, the radial spokes, which are rigidly fixed to a rim, L, having a broad tread. The extremities of

the spokes K are conical, as indicated by the letter *d*. The rim L is perforated for the purpose of reciving freely through it cogs or traction-teeth N, as shown in the drawings. These teeth N are rigidly secured to segments P, and these segments are connected to the hub J of the wheel by means of toggle-levers R. The levers R break joints at *f*, and their extremities are pivoted respectively to the hub J and to the segments P. The outer limbs of these toggle-levers R are rigidly connected to segments T of an internal ring, to which segments lateral projections *g* are fixed at suitable intervals.

I I designate angular reaches, which extend over each one of the wheels B, and which are formed on the extremities of horizontal transverse rods I′, movable in suitable guides beneath the frame A. The inner ends of the rods I′ of the reaches I are connected to toggles I^2, to which a rod, M, is suitably pivoted, that is connected to a hand-lever, M′, located in a position convenient to the engineer stationed on the platform E.

The two limbs of each one of the reaches I are provided with cams *k k′*, which are arranged in such relation to the lateral projections *g* and the segments T of the inner ring that the engineer can cause either the outer cam, *k′*, or the inner cam, *k*, to be struck by said projections, the effect of which would be to either retract the traction-teeth within the perimeter or tread of the rim L or to protrude them beyond the tread.

Between the segments P and the rim L of each wheel B springs S are coiled around the conical portions *d* of the spokes, which by their recoil aid in the retraction of the teeth N.

When the toggle I^2 is moved in an angular position, so as to retract the reaches I and bring the cams *k′* into play on the projections *g* of the segments T, the toggles R will be broken at *f* and springs S will aid in retracting the teeth N within the peripheries of the wheels B.

When the teeth N are protruded beyond the rims of the wheels the joints *f* of the toggles R incline toward their respective spokes, so as to form a perfect lock, which can only be broken by adjusting the reaches I so that cams *k* will act on the inner portions of the projections *g*.

It will be seen from the above description that the attendant stationed at E can cause the teeth N of the driving and transporting wheels to be protruded or retracted at pleasure.

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

1. The combination of the toothed segments P, the perforated rim L, through which the teeth pass, the toggles R, connected by the segments P to the hub J and to the segments T, and means for protruding the teeth beyond the periphery of the rim and retracting the teeth, substantially as described.

2. In a traction or road engine, the reaches I, provided with cams and a toggle-connection for extending the reaches, in combination with transporting-wheels having radially-movable traction-teeth adjustable by means of said cams, substantially as described.

3. The combination of the perforated rim L, the traction-teeth N, fixed to radially-expansible segments P, the spokes K, having conical ends *d*, the springs coiled around these ends, the segments T, provided with projections *g*, the toggles R, and the cams on the adjustable reaches I, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

NEWTON W. BUSHNELL.

Witnesses:
T. H. ALEXANDER,
WM. R. KEYWORTH.