

(No Model.)

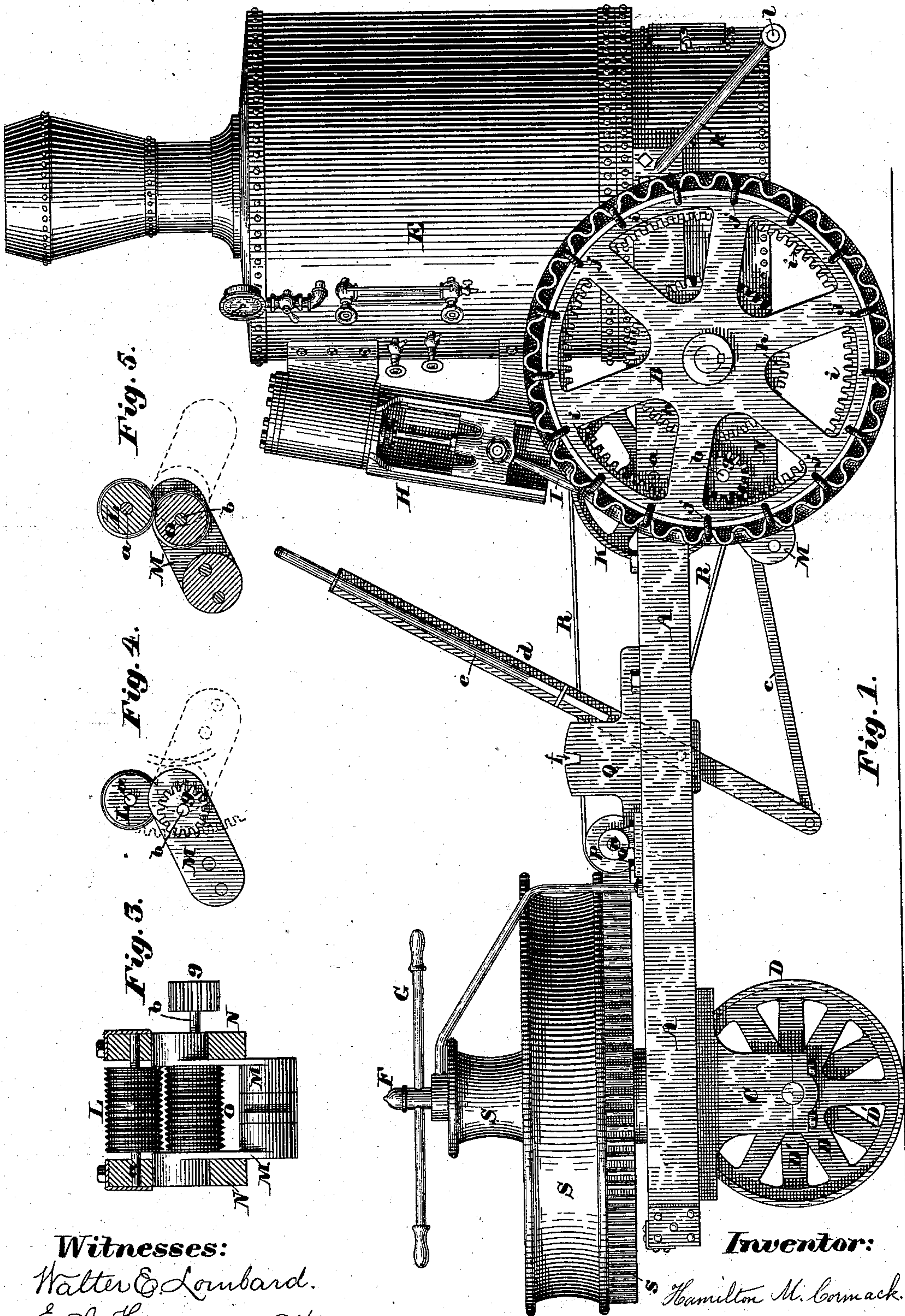
2 Sheets—Sheet 1.

H. M. CORMACK.

TRACTION ENGINE.

No. 291,300.

Patented Jan. 1, 1884.



Witnesses:
Walter E. Lombard.
O. A. Hemmenway.

Inventor:
Hamilton M. Cormack.

(No Model.)

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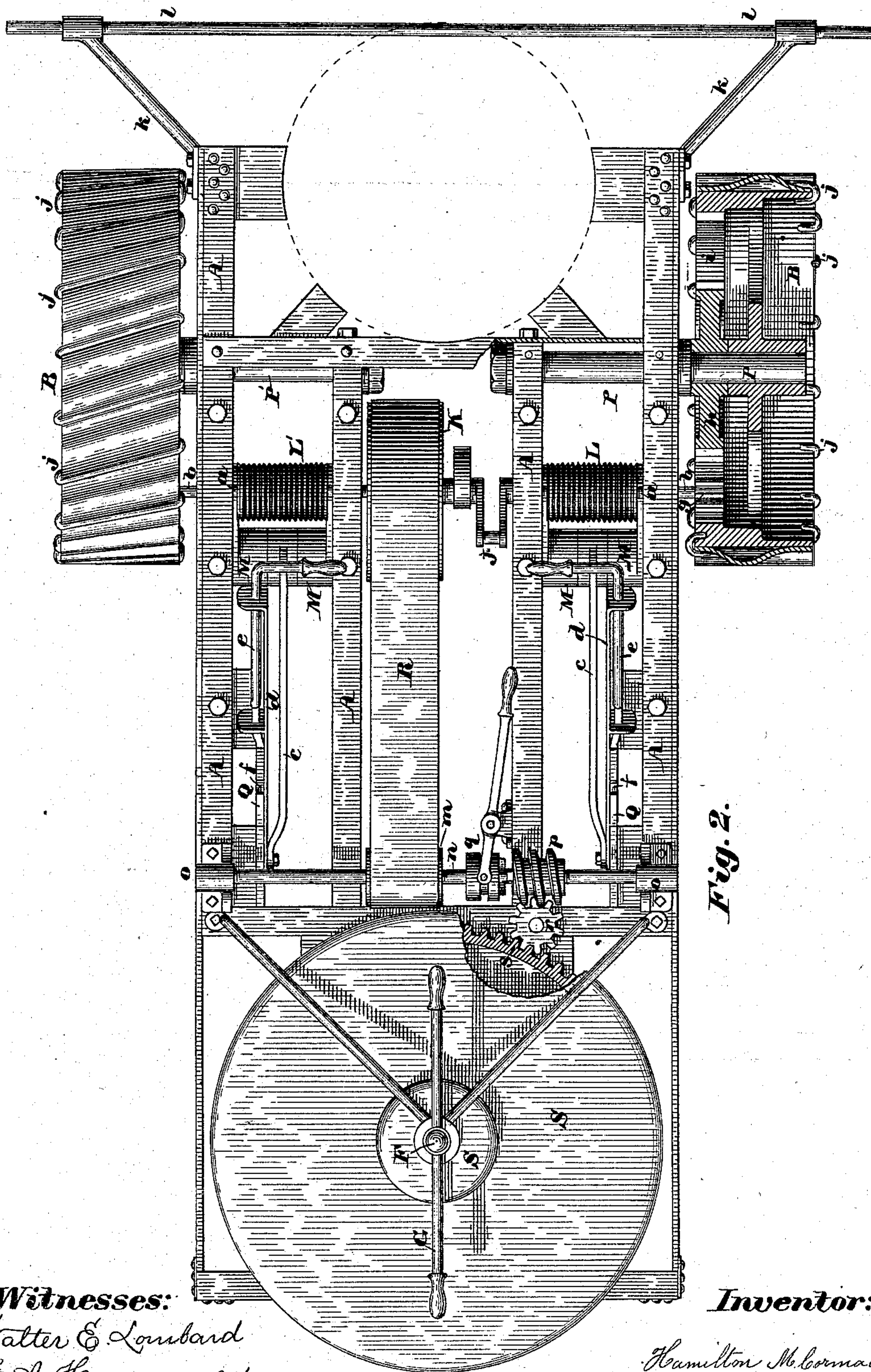


Fig. 2.

Witnesses:

Walter E. Lombard
C. A. Hemmenway

Inventor:

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UNITED STATES PATENT OFFICE.

HAMILTON M. CORMACK, OF MALDEN, MASSACHUSETTS.

TRACTION-ENGINE.

SPECIFICATION forming part of Letters Patent No. 291,300, dated January 1, 1884.

Application filed September 11, 1883. (No model.)

To all whom it may concern:

Be it known that I, HAMILTON M. CORMACK, of Malden, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Traction-Engines, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to that class of engines known as "traction-engines," and has for its object the production of a simple and durable engine, which may readily be used for plowing and other agricultural work, either directly or by means of a suitable cable system; and it consists in a certain novel construction and arrangement of parts, which will readily be understood by reference to the description of the drawings and the claims to be hereinafter given.

In the drawings, Figure 1 represents a side elevation of my improved traction-engine. Fig. 2 represents a plan of same with the boiler and cylinder removed. Figs. 3, 4, and 5 represent details of my improved reversing-gear, which will hereinafter be fully described.

A is the main frame or carriage, mounted on the traction-wheels B B' and the steering-frame C, in which are mounted, in suitable bearings, the wheels D D'.

Immediately back of the axles is mounted the boiler E, in such a manner that its weight about equalizes the weight of the working parts on the front of the carriage, thereby bringing the strain and weight over the traction-wheels B B', by which means the steering-frame is relieved of any undue pressure, and is therefore the more easily turned.

The steering-frame C is provided with the shaft F, fitted to suitable bearings in the frame A, and having secured to its upper end the handle-bar G, by which the machine may be easily guided in its movements when used as a traction-engine.

To the front side of the boiler is secured an engine, H, of any suitable construction, to the cross-head of which is secured one end of the connecting-rod I, the other end of which is connected to the crank J, firmly secured to the shaft a, on which are also secured the fly-wheel or pulley K and the friction-gears L L', the shaft a being provided with suitable bearings in the frame A.

Immediately below the friction-gears L L' are pivoted the levers M M, mounted in suitable bearings in the brackets N N, which are firmly secured to the under side of the frame A by suitable bolts, as shown in Fig. 3. The brackets N N are also provided with suitable bearings for the axles P P', on which are mounted the traction-wheels B B'.

In the hubs of the levers M M, which are mounted in bearings in the brackets N N, and eccentric to said hubs, are mounted the shafts b b, which are each provided with a friction-gear, O, which may be made to engage with the friction-gear L or L' by causing the lever M to take the position shown in Figs. 4 and 5, which is done by means of the connecting-rods c c and levers d d, said levers being pivoted to the sectors Q Q, firmly secured to the frame A, and provided with the sliding catches e e, which engage either with one of the sides of the sector Q or with the notch f. As shown in the drawings, the catch e is firmly pressed against the side of the sector Q, thereby, by means of rod c and levers M M, forcibly connecting the friction-gears L O, and causing the shaft b to revolve, and with it the pinion g, mounted thereon at its outer end, which pinion engages with the internal gear forming a part of the traction-wheel B, causing the same to revolve, thereby moving the carriage. If it is necessary that the carriage be moved in the opposite direction, it may be readily accomplished by disengaging the catch e from the side of the sector Q, and moving the lever d to the opposite side of the sector and engaging the catch e therewith, thus moving the levers M to their opposite extreme, thereby engaging the friction-gear O with the friction-gear L, and the pinion g with the external gear, h, of the traction-wheel B, thus causing the wheel to revolve in a direction opposite to that in which it has been revolving. This may be readily done without any shock or jar to the machinery, as during the movement of the levers M M from one extreme to the other the friction-gears L O are disengaged, as in Fig. 3, thereby transmitting no power to the pinion g, and therefore the gear i, thus allowing the friction on the traction-wheel B to partially overcome the momentum of the carriage before the pinion g is engaged with the gear h to impart motion in the opposite

direction. If the pinion were thrown so suddenly from one gear to the other that the wheel B continued to revolve in the same direction, the friction-gears would simply slip until enough friction had been exerted to stop the wheel B in its movement, when the pinion *g* would commence to operate to send it in the opposite direction. Each of the traction-wheels being mounted upon a separate axle and provided with a separate reversing-gear, one wheel may be made to move backward while the other is moving forward, thereby allowing the carriage to make a very short turn, which in agricultural work is a great advantage. By using a reversing-engine and reversing it when the pinion is moved from one gear to the other, two distinct speeds may be acquired in either direction.

The traction-wheels B B are made of any suitable material, but preferably of cast-iron, and are provided each with an internal gear, and have secured upon their hubs an external gear somewhat less in diameter, so that a space may be left between the teeth of the two gears of a width somewhat greater than the diameter of the pinion *g*, the objects of which have already been stated. To the rims of these wheels plates of diagonally-corrugated sheet iron or steel are firmly secured by the tie-rods *j*, of any suitable metal, said rods being placed in alternate corrugations and secured at one end by being bent in a U shape, and having its shorter end inserted into a hole in the rim of the wheel B, while the other end is correspondingly bent over a notch in the rim, and thus securely clamps the tire in place. This produces a simple, durable, and most effective tire for traction-wheels, giving a good hold to the ground, and having a slight elastic movement, which tends to displace any mud or clay which may have adhered thereto, and absorbs all shocks imparted thereto by uneven surfaces at the rim of the traction-wheel, where it is most effectually taken up, thereby relieving the machinery of any undue jar or strain.

To the rear of the carriage are secured the rods *k k*, which grip in their outer ends the rod *l*, to which a gang-plow or other agricultural implement may be attached when it is so desired.

The pulley K, mounted upon the driving-shaft *a*, imparts motion through the agency of the belt R to the pulley *m* upon the secondary shaft *n*, mounted in the bearings *o o*, secured to the frame A, and provided with the worm-gear *p*, loosely mounted thereon, and the clutch *q*, adapted to slide lengthwise of the shaft *n*, and engage with the worm-gear *p* and cause it to revolve, said clutch being mounted upon the shaft *n*, so as to revolve therewith. The worm-gear *p* meshes into and imparts motion to the pinion *r*, which in its turn imparts motion to the external gear, *s*, on the lower edge of the hollow drum S, which is loosely mounted upon the steering-shaft F.

The drum S is provided with two different

speeds, which are adapted to carry a cable, which may be made to haul or propel cultivating machinery across a field, or for any other purpose, all in a well-known manner. When the drum S is in use, the carriage necessarily should be stationary. Therefore the lever *d* should be in a vertical position, with the catch *e* engaged with the notch *f* to hold said lever in place, thereby disengaging the friction-gears L O, as shown in Fig. 3, and holding them in that position, thus preventing any motion from being given to the wheels B B. The gear *s* of the drum S may be made to mesh with the worm-gear *p* without using the pinion *r* without altering the principles of my invention.

A great advantage is gained in using the tie-rods *j* to secure the corrugated plates to the rim of the traction-wheel, inasmuch as when once secured in place there is no loosening of parts and liability of the plate dropping off, as would be the case if bolts and nuts were used. The continual jarring and jolting have a tendency to loosen any nut, no matter how tightly secured.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a traction-engine, a reversing-gear consisting of a wheel mounted upon a fixed axis, and provided with both an internal and an external gear, and a pinion mounted upon a movable axis, and provided with means for revolving the same, and adapted to be moved from one gear to the other without stopping the engine.

2. In a traction-engine, the combination of a wheel provided with both an internal gear and an external gear, a pinion adapted to engage with either of said gears, a pair of friction-gears for driving said pinion, and mechanism adapted to move said pinion from a position in contact with one of said gears to a position in contact with the other, and at the same time to throw the friction-gears out of and into contact with each other, substantially as and for the purposes described.

3. In a traction-engine, the combination of the wheel B, provided with the external gear, *h*, and internal gear, *i*, the pinion *g*, secured to the friction-gear O, and both mounted in the swinging frame M, the friction-gear L and means of imparting motion thereto, the connecting-rod *c*, and the lever *d*, provided with means for holding it in any required position; all substantially as and for the purposes described.

4. In a traction-engine, a traction-wheel provided with a tire made of thin corrugated sheet metal, secured to the rim of said wheel by any suitable means, substantially as and for the purposes described.

5. In a traction-engine, a traction-wheel provided with a tire made of thin diagonally-corrugated sheet metal, secured to the rim of said wheel by means of suitable rods, which pass through the corrugations, and are firmly

secured at their ends to the opposite sides of the rim of the wheel, substantially as and for the purposes described.

6. In a traction-engine, the combination of
5 the two-speeded drum S, provided with the gear s, the worm-gear p, shaft n, pulley m, belt R, pulley K, shaft a, and means of rotating the same, all substantially as and for the purposes described.

10 7. In a traction-engine, the combination of the geared drum S, mounted upon the steer-

ing-shaft of the carriage, and suitable means for revolving said drum, substantially as and for the purposes described.

In testimony whereof I have signed my name 15 to this specification, in the presence of two subscribing witnesses, on this 8th day of September, A. D. 1883.

HAMILTON M. CORMACK.

Witnesses:

WALTER E. LOMBARD,
E. A. HEMMENWAY.