3 Sheets—Sheet 1.

O. H. BURDETT.

Traction-Engine.

No. 224,868. Patented Feb. 24, 1880.

Fig: 1.

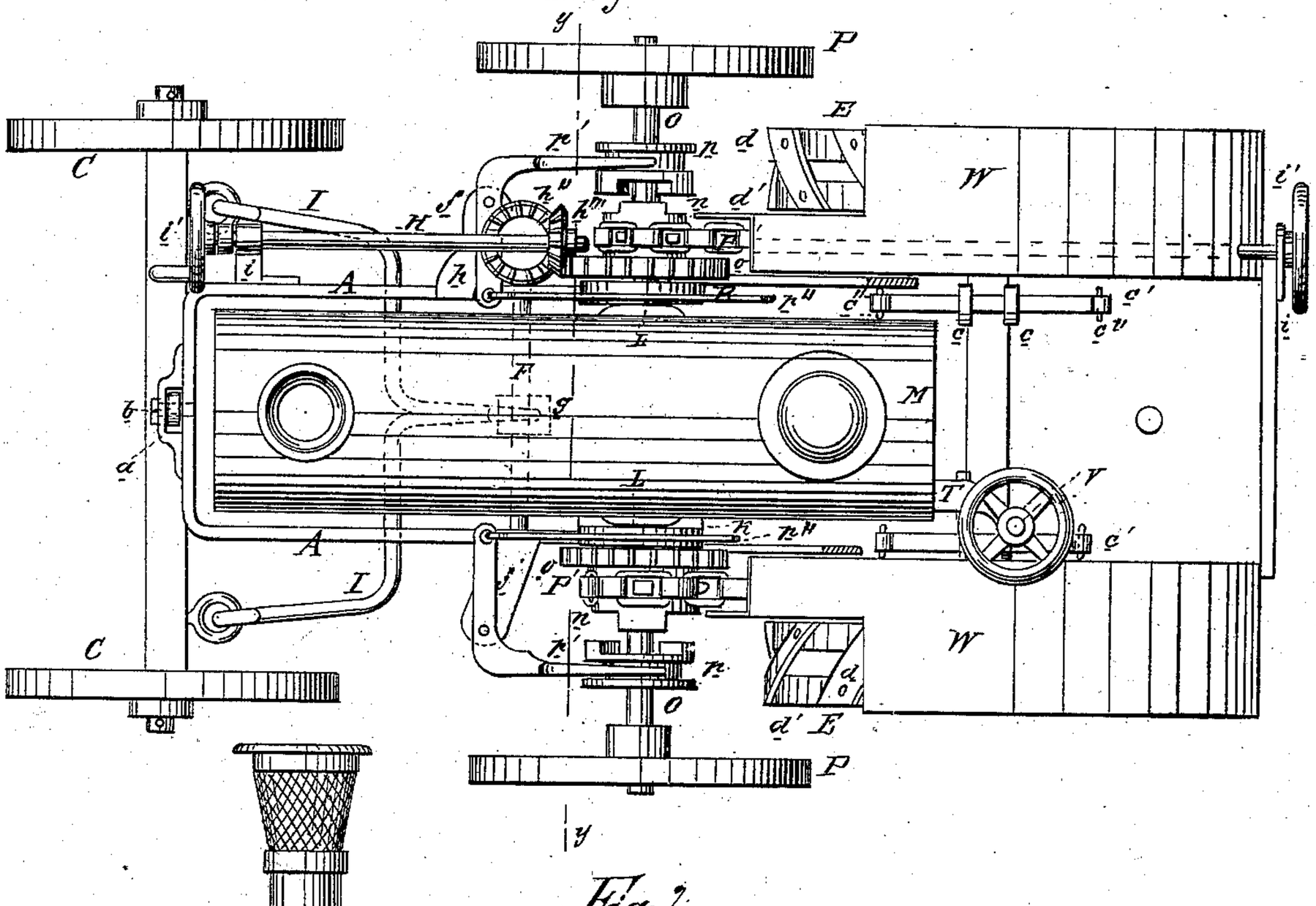

Fig: 2.

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Fig: 3.

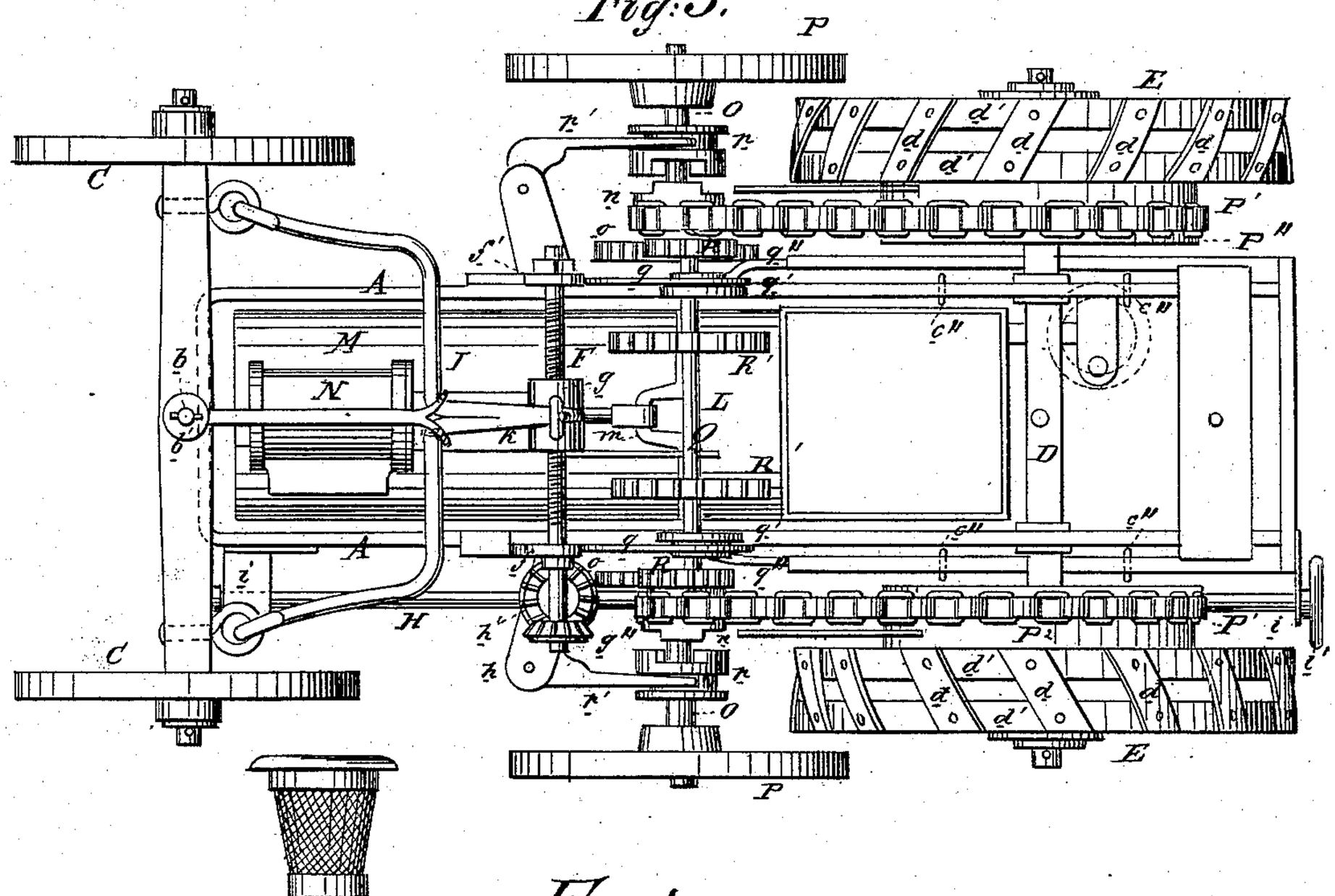

Fig: 4.

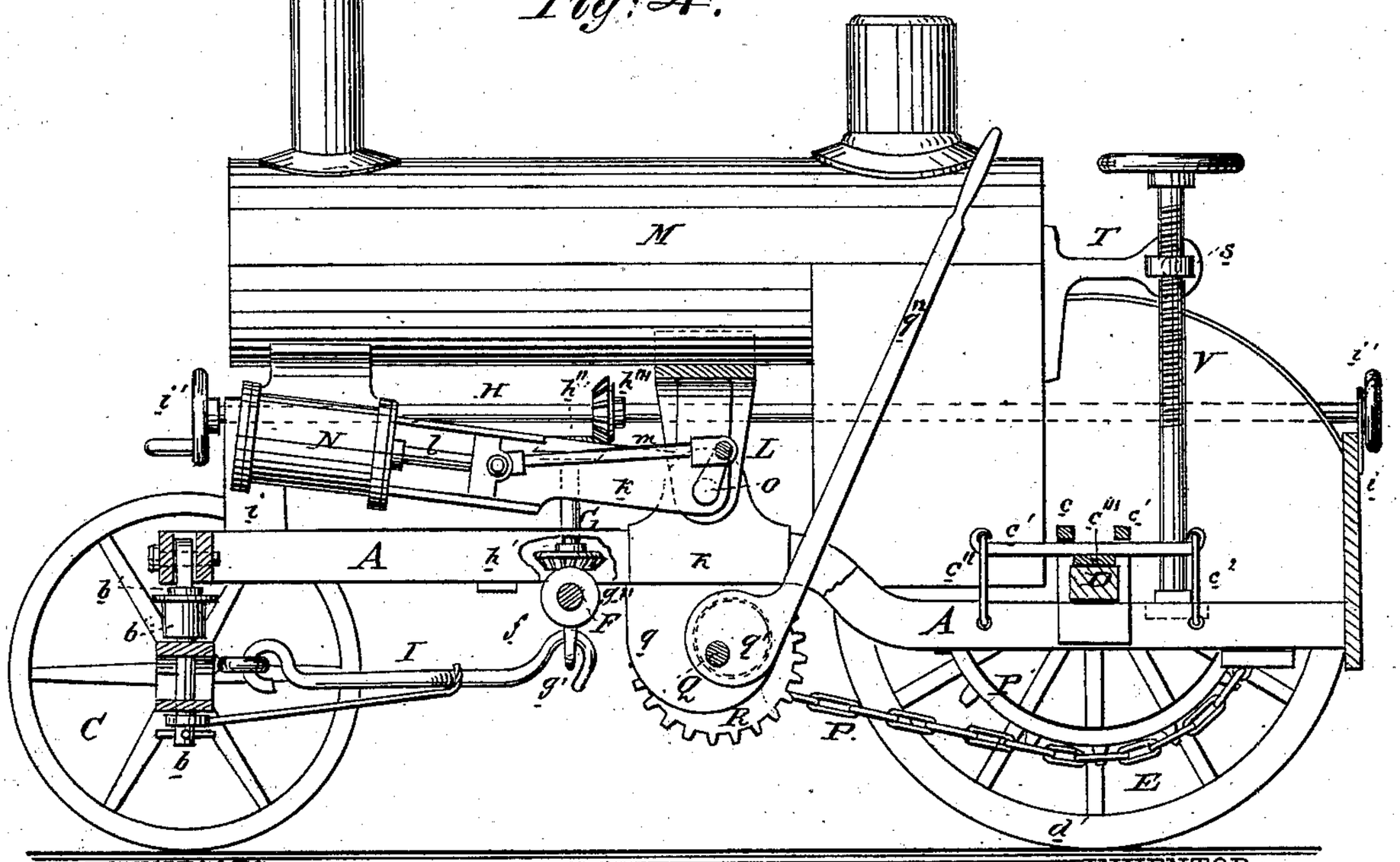

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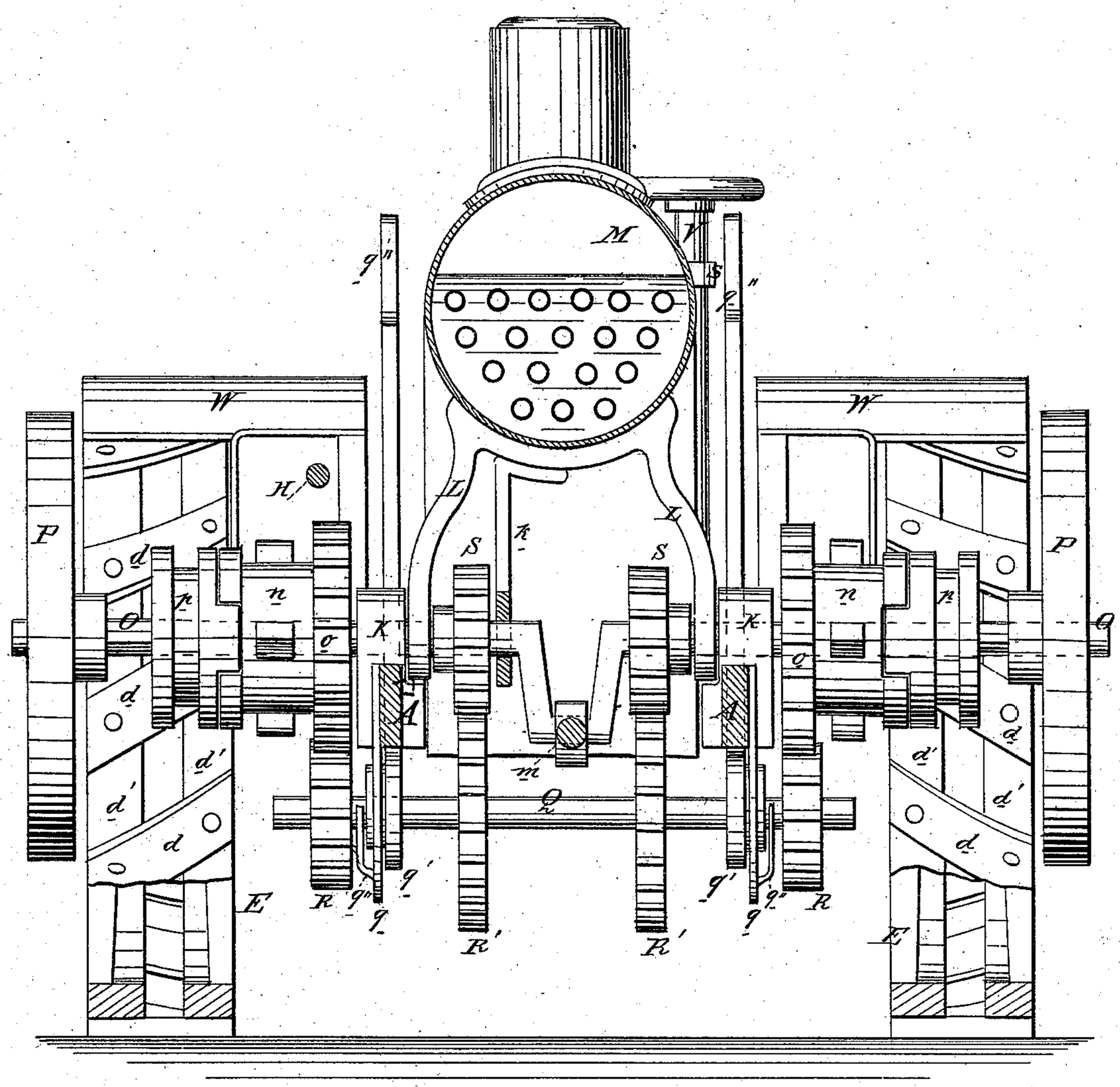
Fig: 5.



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UNITED STATES PATENT OFFICE.

OLIVER H. BURDETT, OF NEW ATHENS, OHIO.

TRACTION-ENGINE.

SPECIFICATION forming part of Letters Patent No. 224,868, dated February 24, 1880.

Application filed December 20, 1879.

To all whom it may concern:

Be it known that I, OLIVER H. BURDETT, of New Athens, in the county of Harrison and State of Ohio, have invented a new and Improved Traction-Engine, of which the following is a specification.

Figure 1 is a plan of the engine. Fig. 2 is a side elevation of the same. Fig. 3 is a plan view of the under side of the engine. Fig. 4 is a longitudinal sectional elevation with some parts left out that other parts may better be seen. Fig. 5 is a transverse sectional elevation on line *y y*, Fig. 1.

Similar letters of reference indicate corresponding parts.

This invention relates to that class of traction-engines or road-steamers that are intended to draw loads on ordinary roads, and to be used for thrashing, corn-shelling, wood-sawing, and kindred purposes.

The object of the invention is to squeeze the dirt between diagonal bars and leave the face or outside of the wheels clean; also, to give elasticity to the axle-frame; also, to hold the boiler securely in place on the engine, and also to secure the steam-cylinder to the under side of the boiler.

In the drawings, A represents the frame of the engine, on the front of which is a loop, *a*, within which the king-bolt *b* of the front axle is pivoted, and between the shoulder *b'* of the said king-bolt and the upper face of the front axle, B, is a rubber cushion, (or it may be a spring of any kind,) *b''*.

The king-bolt *b* being pivoted in the frame A and having nearly all its play there, in order to adapt the front wheels, C, to the irregularities of the ground over which they may pass, makes this place between the frame and axle peculiarly adapted for a spring.

The rear end of the frame A is held suspended from the axle D of the driving-wheels E by four loops, a pair of which loops, *c*, embraces the said axle D near each end of it, while to accommodate these said loops *c*, and in order that it may move up and down in them, the axle is slightly cut away or grooved, and the loops *c*, fitting in these grooves, prevent end or lateral motion of the said axle D.

Spring rods or bars *c'* pass through the eyes of these loops *c* over the face of the axle D, and, extending longitudinally in both directions over and parallel with the frame A, they (the rods or bars *c'*) have their ends connected with the said frame A by links, plates, clevises, or bolts *c''*, or other suitable device.

On the top of the axle D and under the spring-rods *c'* a cushion or spring, *c'''*, of some elastic material may be placed, to give additional elasticity to the whole device.

Thus it will be seen that the entire frame on which the boiler and all the working parts rest is mounted on springs on the running-gear. These loops *c* not only prevent lateral motion of the axle D, but, should the spring-rods *c'* or the links or bolts *c''* break, these loops *c*, if a piece of spring-rod remains through their eyes, or if a rod or bolt be put through them, will sustain the frame A in position and prevent its falling farther than through the space allowed in the said loops *c* for the play of the said spring-rods *c'*, so that in the event of such breaking the engine can still safely and conveniently travel of itself to the repair-shop, thus avoiding the delay, trouble, and expense attendant upon the usual method of transporting traction-engines to a repair-shop.

E E are the open-faced skeleton traction-wheels, made open, so that when they run in mud or soft ground the earth will squeeze up between the diagonal cleats or bars *d* and the rims *d'*, and leave the face or outside of the wheels comparatively clean. Constructed in this manner the wheels also take a better hold on soft ground than do the ordinary wheels, and on hard ground they roll as smoothly and with as little thumping as solid-faced wheels.

A traction-wheel as ordinarily constructed has a solid face or rim provided with peripheral cleats, ridges, or corrugations to increase its hold upon the ground; but it is found that in soft ground the spaces between these ridges or corrugations become filled with earth, that packs very hard and creates a smooth surface to the wheel at the very time and place when it needs the most adhesive power.

This objection to the ordinary traction-wheel is entirely obviated by the skeleton-wheel herein shown, and which may be constructed as herein shown, or may have one set of spokes with the rims connected by cleats or bars, or in place of spokes may have a radially-ribbed iron plate, or be constructed in any other suit-

able manner, preserving always, however, the essential features of a skeleton or open periphery or face and the diagonal or cross bars or cleats.

In the hangers *f f*, that depend from the frame A, in front of its mid-section, is journaled the steering-screw F, that stretches transversely across and carries on its thread, between the sides of the said frame A, a nut, *g*, which is provided with a loop or eye, *g'*, and on one end of the said screw F is a miter or bevel wheel, *g''*.

The standard *h* and lug *f'*, both of which are secured to the frame A, afford bearings to the vertical shaft G, to the ends of which are keyed the bevel-wheels *h'* and *h''*, the lower one of which, *h'*, gears with the bevel-wheel *g''*, which is on the steering-screw F, while the upper one, *h''*, gears with the bevel-wheel *h'''*, that is keyed on the longitudinal shaft H, which runs lengthwise of the engine and is supported by the standards *i i*, and has on either end a hand eccentric-wheel, *i' i'*, at each end of the engine, by means of which the said shaft H may be revolved, and the motion of the said shaft H is transmitted through the bevel-wheels and vertical shaft last mentioned to the screw F.

The hounds I of the front axle are hooked or otherwise secured to the nut *g*, so that as the screw F is turned the said nut *g* traverses the said screw F from one side to the other, as the case may be, and carries with it the end of the said hounds I, thereby changing the course or direction of the engine; and by this method of connecting the hounds to the screw F all, or nearly all, strain is taken from the king-bolt *b* when the front wheels, C, or either of them, chance to run against an obstruction.

About midway on either side of the frame A are firmly secured the heavy plates K in sockets, in the inner faces of which rest the legs of the saddle L, which supports the boiler M, the said legs being slotted to permit of adjustment about the driving-shaft O, that passes through them. To the under side of the boiler M, near its front, is secured the steam-cylinder N, whose slide-frame *k* extends rearward and has its upward prolongation bolted or otherwise fastened to the under face of the saddle L. The piston-rod *l* of the engine is connected by pitman *m* to the crank or driving shaft O. This driving or crank shaft O is journaled in the plates K, and carries keyed on either end a belt-pulley, P. Set loosely on the said shaft O, and close to the sides of the frame A, are the combined sprocket-wheels *n* and cog-wheels *o*, the hubs of said sprocket-wheels *n* being indented to correspond with the clutches *p*, that are set on the same shaft, O, and are actuated by the shifting-forks *p'*, which are pivoted on the lugs or hangers *f f'*, and are operated by means of the rods *p'' p''*, that are hooked or otherwise secured to them, and that extend rearward within reach of the operator. Power is transmitted from the crank-shaft O to the driving-wheels E by the chains P', that connect the small sprocket-wheels *n* with the large sprocket-wheels P'', which are part of or attached to the said driving-wheels E.

The motion of the engine may be varied, and additional power be given to it to ascend steep grades by the shaft Q, which is journaled in the hangers *q*, that depend from the sides of the frame A. This shaft Q has secured on it the eccentrics *q'*, to which are fastened the rods *q''*, that extend rearward within reach of the operator, and it has keyed upon it at its ends the two cog-wheels R, that may be made to gear into the cog-wheels *o* on the crank-shaft O, and it has also keyed upon it the two cog-wheels R', that may gear into the cog-wheels S, which are secured on the said crank or driving shaft O. By moving these rods or levers *q''* these cog-wheels R R' can be thrown in or out of gear with the cog-wheels on the driving-shaft O, thereby changing the motion of the sprocket-wheels *n*, which actuate the chains that work the driving-wheels E.

When the engine is to be driven at its highest rate of speed the clutches *p* are thrown in gear with the small sprocket-wheels *n*, which ordinarily make one revolution with each revolution of the driving-shaft O, and on these occasions the shaft Q, with its cog-wheels, is dropped out of gear; but if more power is required and less speed—as, for instance, in drawing a heavy load or ascending a steep grade, as before stated—the clutches *p* are thrown out of connection, and the shaft Q, with its cog-wheels R R', is thrown up in gear with the cog-wheels *o* S, whereby the sprocket-wheels *n* will be made to perform one revolution to every three revolutions of the driving-shaft O. Thus the required increase of power is gained, though at the cost of speed.

The eccentrics *q'* and rods *q''* are convenient and effective devices for throwing the cog-wheels R R' in and out of gear with the cog-wheels on the driving-shaft O; but levers, cranks, or other devices may be substituted for them without departing from my invention.

It will be observed, consequently, that when the engine is to be used for thrashing, shelling corn, sawing wood, &c., or any other work to which a steam-engine is commonly put, it may in effect be converted into an ordinary portable engine by throwing both the clutches *p* and the cog-wheels R R' out of gear.

It will also be seen that by means of the clutches *p* both driving-wheels E E may be thrown into gear separately or together at the will of the operator. The advantage of this is, that in turning sharp curves one wheel can be stopped while the other revolves, thus enabling the engine to turn quickly and in little space.

By having the cylinder, crank-shaft, and other fixtures set below the boiler, the engine is made steady and not so liable to oscillate as those not so designed.

On the front of the boiler M is a fixed pro-

jecting arm, T, in which is a screw-eye, *s*, down through which passes a screw, V, whose lower end is secured in the platform of the engine. By turning this screw V the boiler M may be adjusted or inclined longitudinally to suit the level of the ground on which the engine may be, the legs of the saddle L, which rest in the sockets in the plates K, being the pivots on which the boiler moves.

The shields W over the driving-wheels and about the rear of the engine are similar to those in common use.

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

1. In a traction-engine, and in combination with the rear axle thereof, the open or skeleton driving-wheels E E, provided with rims *d'* and cleats or bars *d*, substantially as and for the purpose described.

2. For suspending the rear end of the frame A, and to give elasticity to its movement, the axle D, loops *c*, springs *c'*, links or bolts *c''*, and elastic cushion or spring *c'''*, in combination, substantially as herein set forth.

3. The frame A, plates K, pivoted saddle L, and boiler M, in combination, substantially as herein shown and described, whereby the said boiler is held in place in the engine.

4. In a traction-engine, the cylinder N, boiler M, and saddle L, in combination, substantially as herein shown and described, the said cylinder being secured to the under side of the boiler, as herein set forth.

OLIVER HENRY BURDETT.

Witnesses:
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ROBERT WELL.