(No Model.)

2 Sheets—Sheet 1.

J. H. ELWARD.

TRACTION ENGINE.

No. 279,925. Patented June 26, 1883.

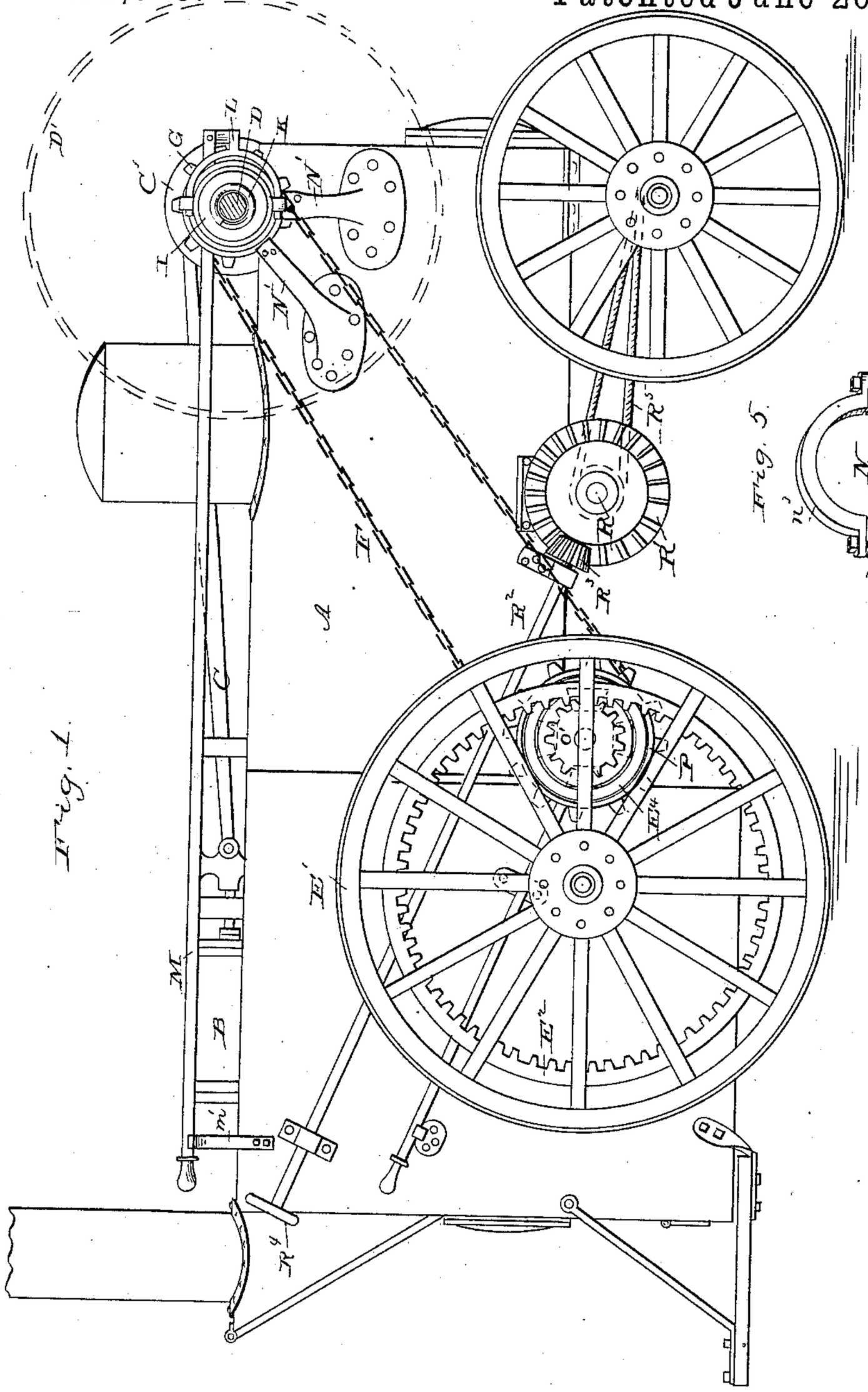

Fig. 1.

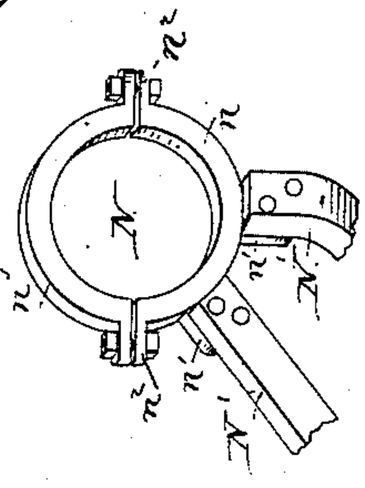

Fig. 5.

Witnesses:
N. S. Law
J. B. Barker.

Inventor:
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(No Model.) 2 Sheets—Sheet 2.

J. H. ELWARD.

TRACTION ENGINE.

No. 279,925. Patented June 26, 1883.

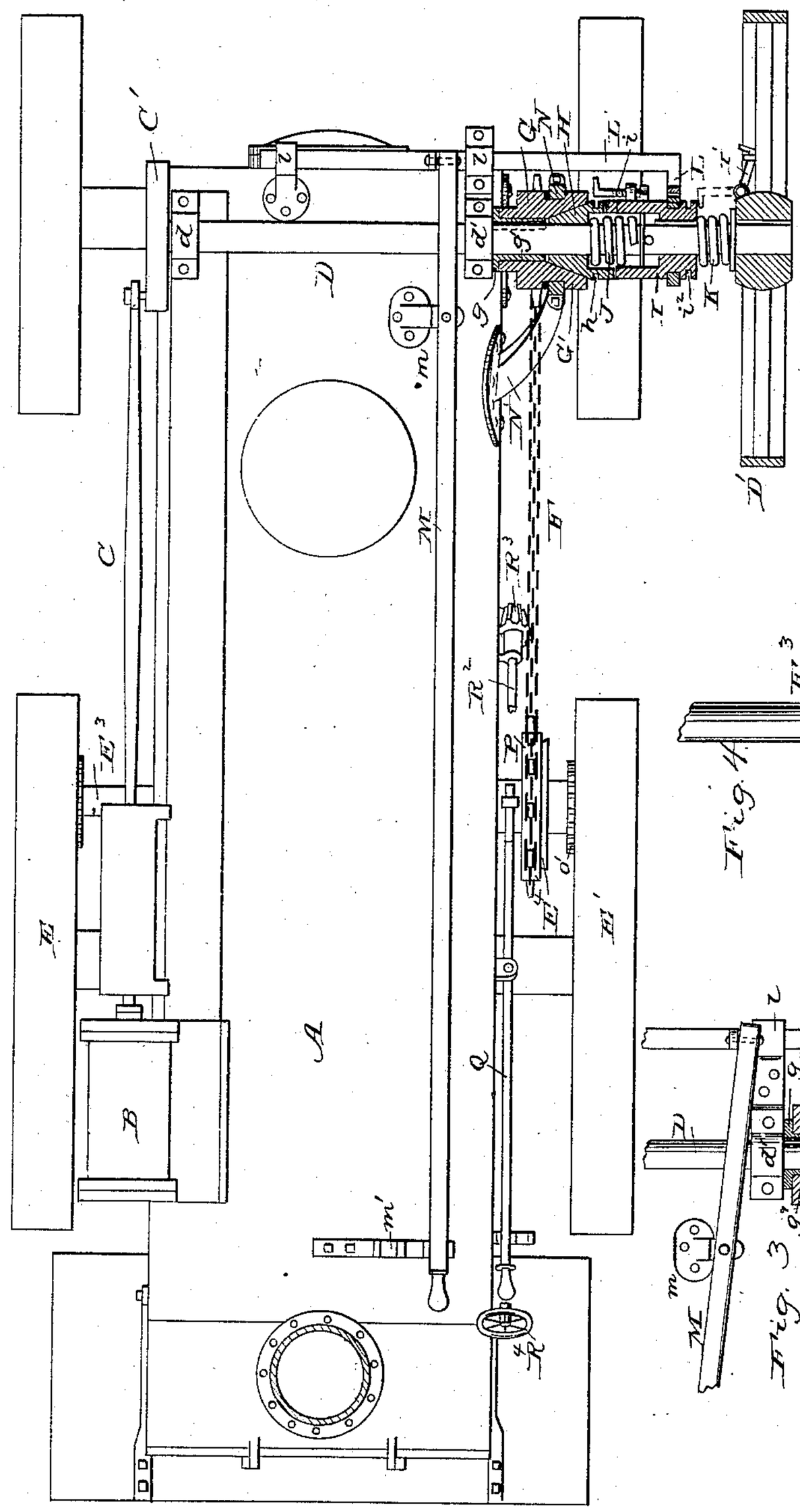

Fig. 2.

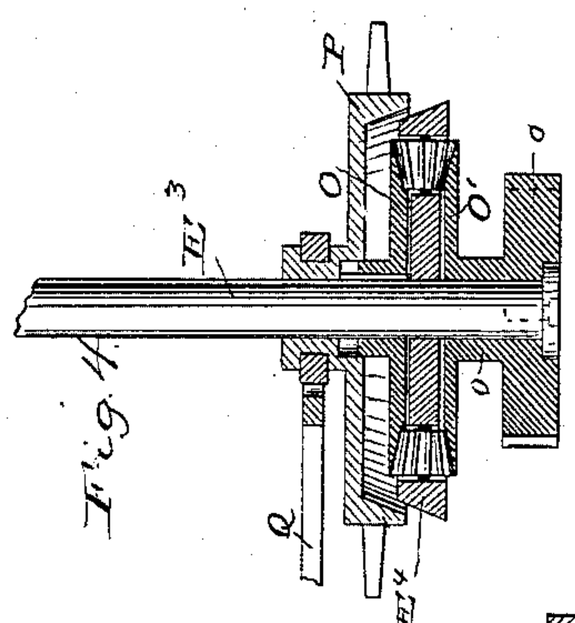

Fig. 4.

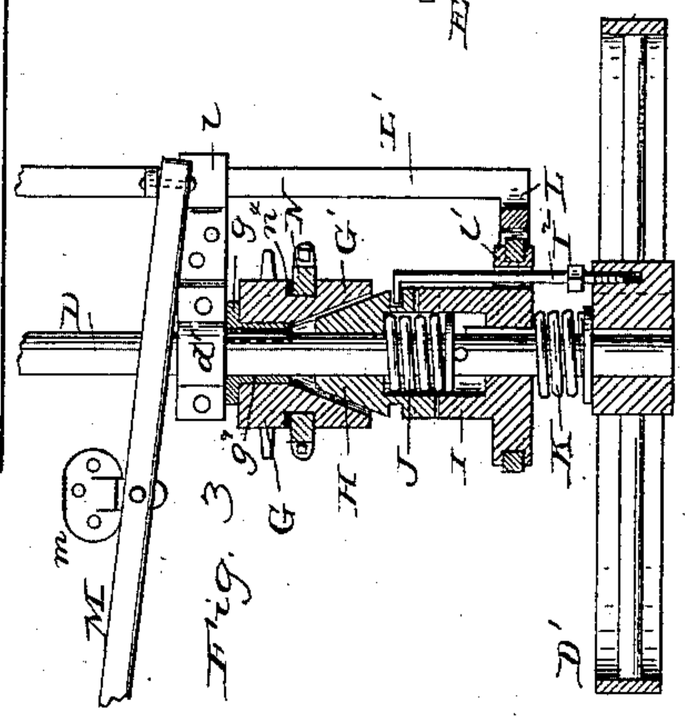

Fig. 3.

Witnesses:

A. N. Low

A. J. Houghton.

Inventor:

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UNITED STATES PATENT OFFICE.

JOHN H. ELWARD, OF POLO, ILLINOIS, ASSIGNOR TO MARY ELWARD, OF SAME PLACE.

TRACTION-ENGINE.

SPECIFICATION forming part of Letters Patent No. 279,925, dated June 26, 1883.

Application filed November 11, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. ELWARD, a citizen of the United States, residing at Polo, in the county of Ogle and State of Illinois, have invented certain new and useful Improvements in Traction-Engines, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a side elevation of an engine embodying my improvements. Fig. 2 is a top plan view of the same. Fig. 3 is a sectional view of a modified form of the friction connection between the main engine-shaft and the traction devices. Fig. 4 is a sectional view showing the relations of the compensating-gear to the counter-shaft and traction-wheel. Fig. 5 is a perspective of the support for the stationary part of the friction-clutch detached.

The parts which relate especially to the present invention may be combined with a traction-engine of any of the forms with which I am acquainted, though I have shown a machine of that style which I prefer.

In the drawings, A represents a boiler of the class generally known as "fire-box" boilers, the furnace being located at the rear end thereof. The cylinder B, pitman C, and crank-wheel C′ may be of the ordinary form.

D represents the main engine-shaft, mounted transversely across the machine, at the front end, in suitable bearings, as at *d d′*, there being a fly-wheel or band-wheel, D′, at the end opposite to that carrying the crank-wheel C.

The traction-wheels or drive-wheels are represented by E E′, they being mounted loosely relatively to each other upon a cranked axle or upon stud-axles. They are each provided with an interior toothed wheel, E^2, to which power is imparted from the counter-shaft E^3. The power is transmitted to said shaft by means of a wheel, E^4, which may be either rigidly secured to the counter-shaft, or which may have combined with it a compensating-gear, in a manner to be hereinafter described. This wheel is directly or indirectly rotated by means of a chain, F, which is rotated from a wheel, G, on the engine-shaft. The hub of the wheel G is expanded considerably, and is recessed to have a hollow conical chamber, G′. This wheel and its recessed hub are loose upon the shaft, but can be connected therewith by means of a toothed clutch, I. Between the clutch I and the wheel G there is interposed a convex cone, H, adapted to be held permanently in contact with the concave hub by means of a coiled spring, J. This spring bears against a pin or stop upon the shaft, and also against the convex cone H, the latter being chambered at its outer end to receive the spring. The toothed clutch I is feathered upon the shaft D, but can slide to and fro thereon, so as to be thrown into and out of engagement with the conical part H, which latter has at its outer end clutch-teeth corresponding to those in the part I.

K is a coiled spring between the hub of the band-wheel or fly-wheel D′ and the sliding clutch I, and tending to thrust the sliding clutch into engagement with the conical part H. The tension of this spring K, however, can be overcome, and the clutch can be moved out of engagement with the cone by means of a shifting device consisting of a forked arm, L, carried by a sliding bar, L′, mounted in guides or bearings *l l*, secured to the top of the boiler. The bar L′ is moved to and fro by means of a vibrating lever, M, pivoted at *m* or at other suitable point to the top of the boiler, and extending back to within reach of the driver, it having preferably combined with it a rack, as at *m′*, to fasten it in any desired position.

When it is desired to throw the main engine-shaft out of connection with the traction mechanism, this can be effected by means of the lever M, for with this lever the bar L′ can be slipped in its bearings sufficiently to throw the teeth of the clutch part I away from those attached to the cone H. The said cone H is prevented from slipping out of engagement with the hollow cone G′ by means of the spring J.

When it is desired to transmit the power from the engine to the traction devices, it is accomplished by throwing the clutch I back into engagement with the cone in substantially the ordinary manner. The friction-cone H, when related in the way described to the toothed clutch and to the traction devices, prevents the breaking of any of the parts, either

those directly connected with the power devices or those constituting the traction mechanism, for if too great power should suddenly be exerted the convex cone H will slip upon the concave one, G′, sufficient yielding for this purpose being permitted by means of the spring at J.

I have shown, also, the improved devices which I employ with the parts above described to hold the parts of the friction-connection out of engagement with each other when the machine is being used for thrashing or for transmitting power for other purposes. The cone H or the hub thereof is provided with a groove, as at *h*, and the sliding part I is provided with a hook, *i*, adapted to have its end engage within said groove. When the part I is moved out and held out by the lever M and bar L′, the cone H can be, by the hook *i*, secured to said part I, and also held away from the parts G and G′. While being thus held out the engine-shaft can turn freely for thrashing or other similar purposes, and have no loose parts to rest thereon, which, as is well known, results disastrously in the cutting and rapid wearing away of the shaft. After these parts have been withdrawn to the desired point, they can be locked there permanently by means of a hook, I′, pivoted to the fly-wheel D′, and adapted to engage with the sliding part I by means of a groove, i^2, therein. The wheel G and the recessed hub thereof are supported independently of the shaft and the other parts by means of an annular or semi-annular bearing, N, supported upon brackets N′, attached to and rising from the side of the boiler. These parts insure that when the traction devices are at rest the wheel G and its recessed hub G′ shall not rest upon the shaft to cut or wear it.

Instead of the two hooks *i* and I′, above described, use may be made of one, as shown at I^2 in Fig. 3. In this construction a hooked rod, I^2, is secured to the hub of the wheel, preferably by screw-thread, and is passed through a flange, *l*′, on the sliding part I, and adapted to engage with the cone H in the groove *h*.

I prefer to employ upon the counter-shaft E^3 a compensating-gear of the kind shown in Figs. 2 and 4. It consists of two bevel-wheels, O O′, one keyed to the shaft E^3 and the other carrying a sleeve, *o*, by means of which it is rigidly connected with the pinion *o*′. The wheel E^4 is beveled, and is adapted to engage with a sliding chain-wheel, P, the periphery of which is beveled to correspond to the wheel E^4. This chain-wheel can slide upon the shaft E^3 into and out of engagement with the wheel E^4, the sliding being effected by means of a lever, Q, pivoted upon the side of the boiler. However, I do not wish to be limited to the use of a compensating-gear of this character, as the other features of the engine may be employed without being combined therewith.

The engine while being propelled may be steered in any preferred way. I have shown a mechanism which I prefer, it consisting of a shaft, R, carrying a bevel-wheel, R′, an operating-shaft, R^2, carrying a bevel-wheel, R^3, a hand-wheel, R^4, and a rope, R^5, rotated by the shaft R, and attached at the ends to the truck-frame of the forward wheels.

The wheel G and its hollow conical hub do not rest or bear directly upon the shaft D, but are mounted upon an interposed lining or thimble, *g*′, which at the end is provided with a laterally-expanded flange or plate, *g*, at the inner end. When the convex cone H is forced inward the part G G′ will be frictionally clamped between the convex cone and the plate or part *g*—that is to say, there will be a frictional engagement between the part G G′ upon the inner side and the shaft as well as upon the outer side.

To permit sufficient longitudinal play, the supporting-bearing N of the part G G′ is preferably made of the form shown in Fig. 5—that is to say, the lower part, *n*, is rigidly fastened to the brackets N′ N′ by means of ears *n*′, and the upper part, n^3, is clamped to the upper part by means of laterally-projecting ears n^2, through which pass bolts, and between which may be placed packing of any suitable thickness and material. The two parts *n* and n^3 are spaced apart by packing-strips or equivalent means, so that when sufficient wear has taken place it may be taken up by removing some of the packing and again clamping the parts *n* n^3 together. The slot or groove n^4, in which this bearing fits, is preferably somewhat wider than the bearing-piece, so that when the connection between the frictional faces is broken the part G G′ can move somewhat away from the part *g*, so that the shaft shall not have any resistance from said part G G′.

What I claim is—

1. In a traction-engine, the combination, with a main engine-shaft and the traction devices, of the chain-wheel G, having the conically-recessed hub G′, the sliding toothed clutch I, and the cone H, adapted to be held permanently against the conically-recessed part G and to be engaged by the toothed part I, substantially as set forth.

2. The combination, with the main engine-shaft and the traction devices, of the chain-wheel G, having a conically-recessed hub, G′, the sliding clutch, toothed clutch I, the cone H, the coiled spring J around the shaft, and the mechanism for withdrawing the toothed clutch I from the cone H, substantially as set forth.

3. The combination, with a main engine-shaft and the traction devices, of the wheel G, having a conically-recessed hub, the sliding toothed clutch member I, the cone H, having toothed connection with the part I, and means, substantially as described, attached to the band-wheel or fly-wheel, for holding the cone H out of engagement with the concave part, as described.

4. The combination, with the wheel G and

the means for imparting rotation thereto by friction, of the divided bearing or support N, having the separable and adjustable parts $n\,n^3$, substantially as set forth.

5. The combination, with the wheel G and the means for imparting rotation thereto by frictional engagement, of the support or bearing, arranged substantially as set forth, to hold it loosely and vertically.

6. The combination, with the wheel G, having a conically-recessed hub, G′, the means for supporting said parts G G′ independently of the shaft, the cone H, and devices for connecting said cone with the wheel G, of the thimble g' and plate or flange g, adapted to be forced into frictional contact with the inner side of the wheel G, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN H. ELWARD.

Witnesses:
J. S. BARKER,
M. P. CALLAN.