

(No Model.)

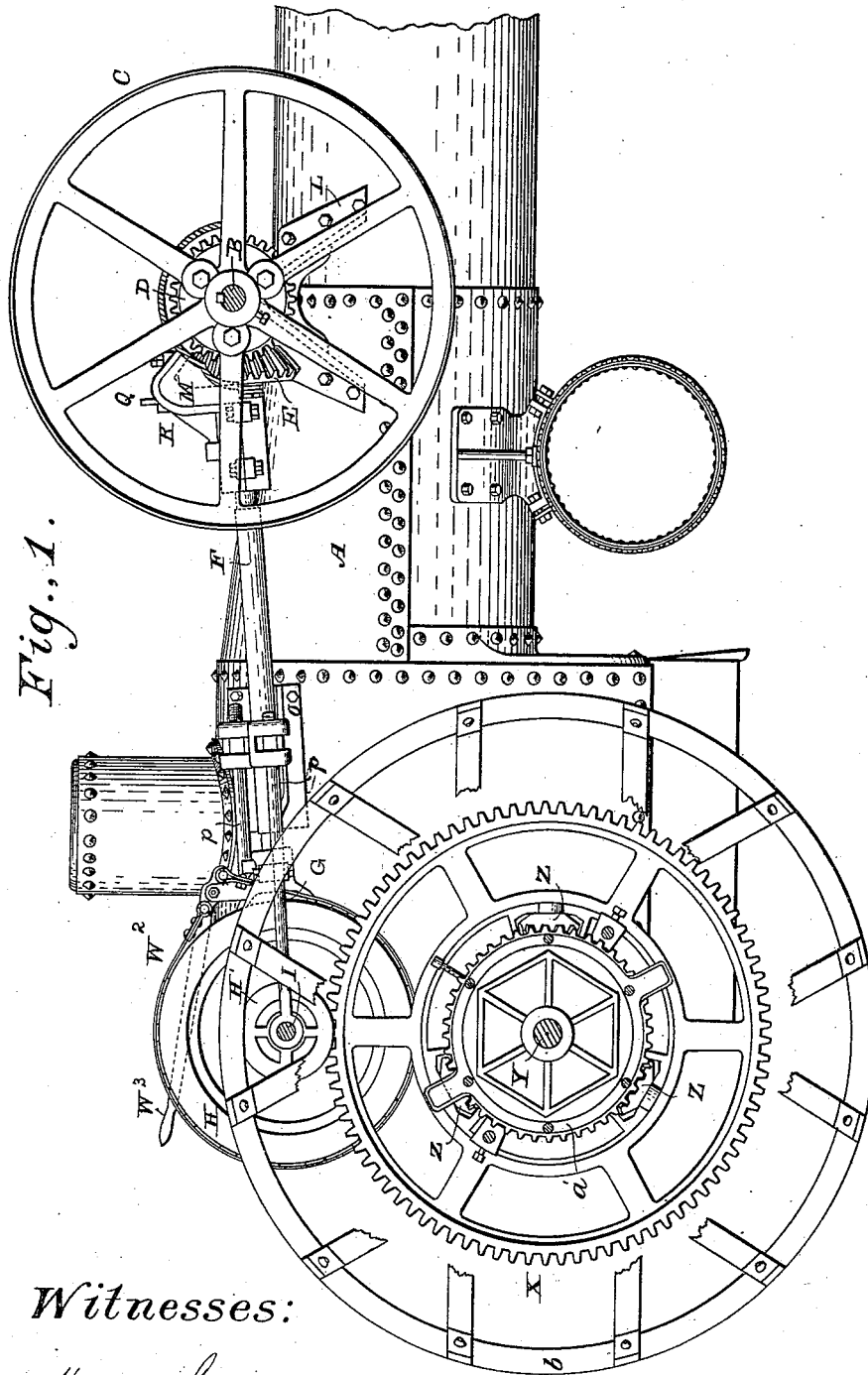
3 Sheets—Sheet 1.

E. M. BIRDSALL.

TRACTION ENGINE.

No. 266,343.

Patented Oct. 24, 1882.



Witnesses:

*Wm. A. Skink*

*Alfred C. Newman*

Inventor:

*Edgar M. Birdsall*

*By his Attorneys*

*Baldwin, Hopkins, & Legton*

(No Model.)

3 Sheets—Sheet 2.

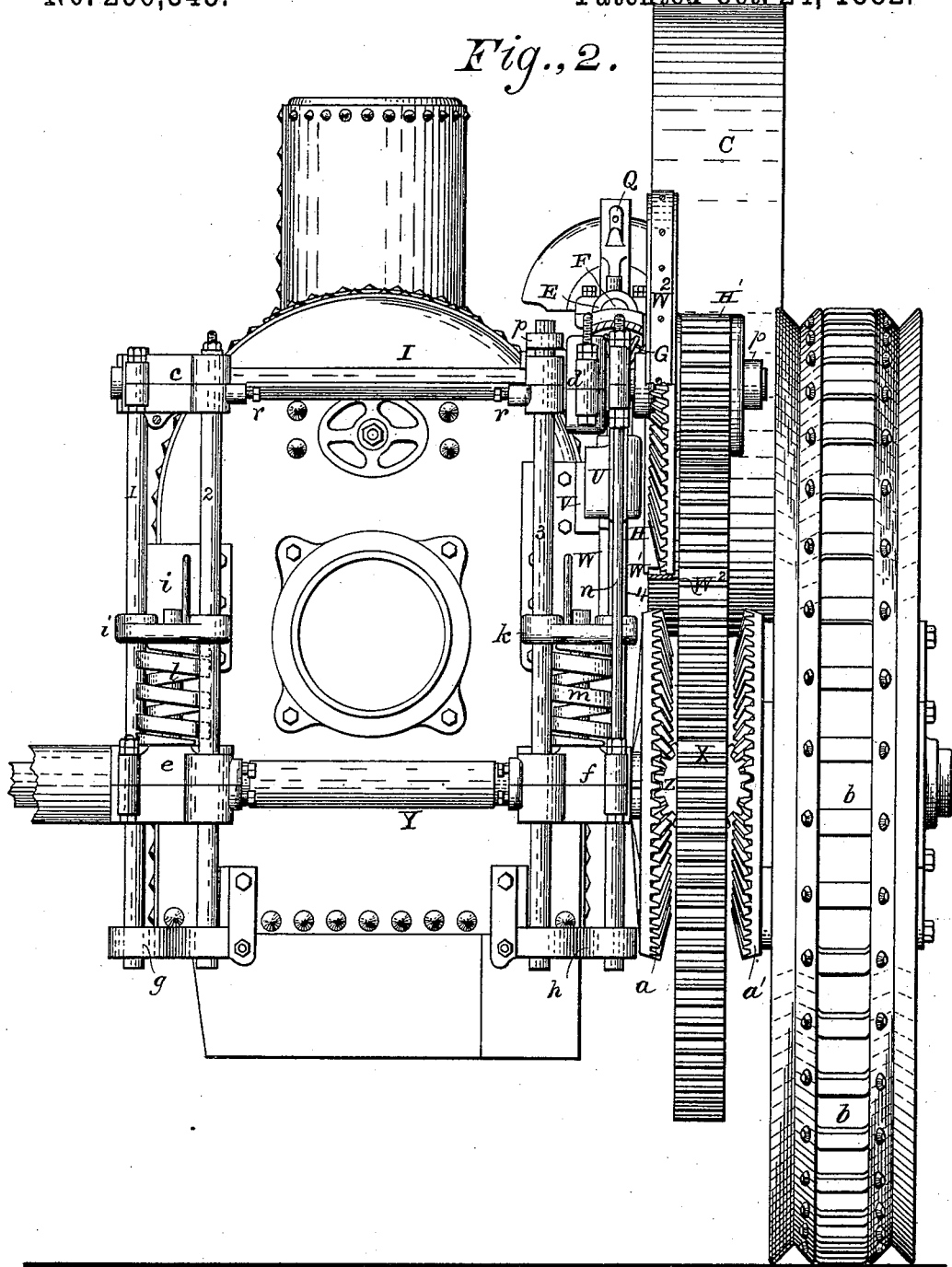
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## TRACTION ENGINE.

No. 266,343.

Patented Oct. 24, 1882.

*Fig., 2.*



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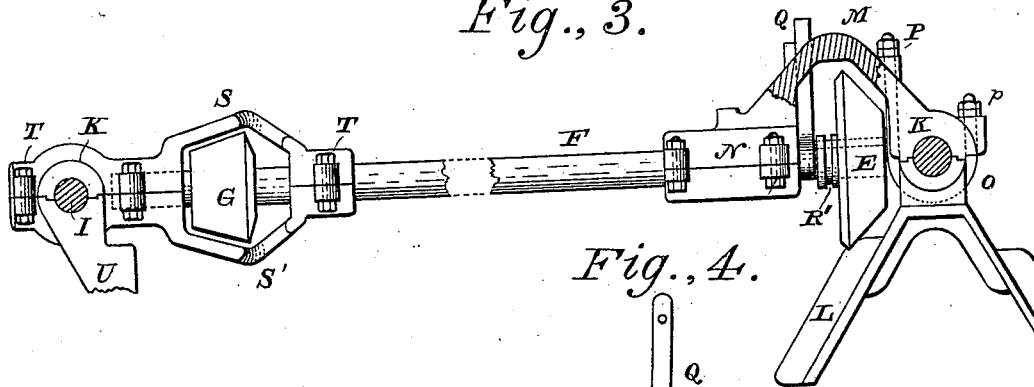
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TRACTION ENGINE.

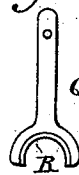
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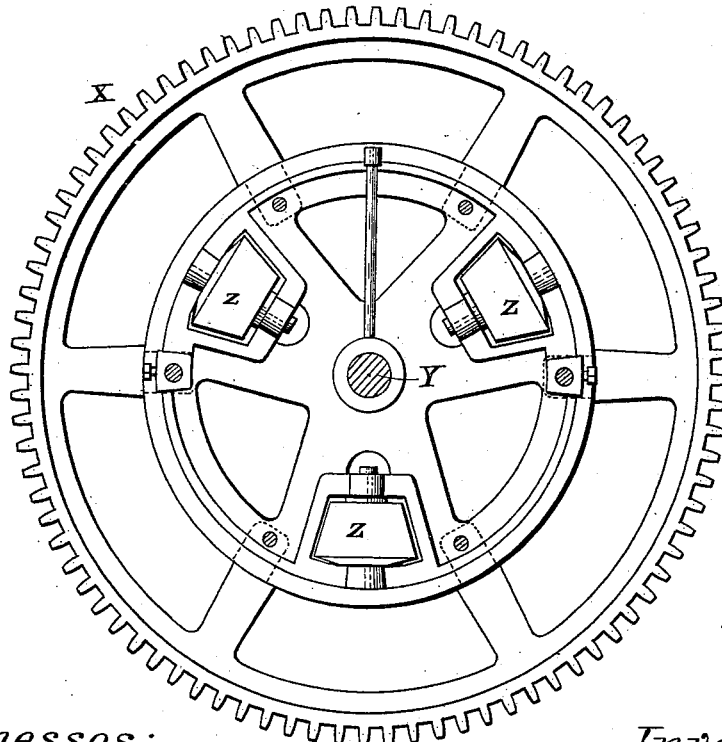
*Fig., 3.*



*Fig., 4.*



*Fig., 5.*



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# UNITED STATES PATENT OFFICE

EDGAR M. BIRDSALL, OF AUBURN, NEW YORK.

## TRACTION-ENGINE.

SPECIFICATION forming part of Letters Patent No. 266,343, dated October 24, 1882.

Application filed August 21, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, EDGAR M. BIRDSALL, of Auburn, in the county of Cayuga and State of New York, have invented certain new and useful Improvements in Traction-Engines, of which the following is a specification, reference being had to the accompanying drawings.

The object of my invention is to attain strength and simplicity in the action and organization of the gearing and connecting operating parts.

In the accompanying drawings, illustrating my invention, Figure 1 is a side elevation of the rear part of a traction-engine. Fig. 2 is a rear end elevation of the same. Fig. 3 is a part of the gearing and connecting mechanism detached. Fig. 4 shows a stop or lock-fork detached, and Fig. 5 is a side elevation of a large spur-wheel provided with bevel-pinions which work upon the rear axle of the engine.

My invention consists in the combinations of parts specified in my claims.

In the drawings, A indicates a boiler, and the driving parts of the engine are not illustrated, because any suitable ones of ordinary construction may be employed.

B indicates the main driving-shaft, and C its balance-pulley.

D is a bevel-pinion fixed to the main driving-shaft, and gearing with another bevel-pinion, E, upon the shaft F, which is supported in suitable bearings, and carries upon its opposite end another bevel-pinion, G, which in turn gears with the bevel-wheel H, loose upon the shaft I, and preferably cast in one piece with the spur-pinion H'. The shaft F has a pivoted tilting bearing, K, upon the main driving-shaft, and also upon the fixed shaft I, so that it may oscillate vertically to accommodate any movements of the parts, due to passing over uneven ground, or the like, without throwing either of its bevel-gears out of place. This pivoted bearing also permits the disconnection of the spur-pinion H' from its connecting-gear, and thus releases the gearing, presently to be described, which is immediately connected with the rear axle and traction-wheel whenever it is desirable to move the engine by team.

L indicates a bracket, secured to the boiler for supporting one of the bearings of the main driving-shaft.

M indicates a yoke-frame or shield, which constitutes the upper half of the journal-box N of the shaft F, and rests upon the upper part of the journal-box of the main driving-shaft, to which it is secured, so as to admit of an oscillating motion by means of the U-bar O and nuts P. This shield serves as a support for the forward end of the shaft F, and also to house the bevel-pinion E.

Q indicates a lock-fork, which straddles over the shaft F and bears against the hub of the bevel-pinion E to hold the pinion in gear. The handle of this lock-fork passes up through the housing M, and the fork is provided with a curved tongue or projection, R, corresponding with the annular recess R' in the hub of the bevel-pinion E. When the lock-fork is in place, as represented in Fig. 3, the pinion E will be engaged. When it is desired to disengage the pinion the lock-fork is raised, the pinion is slipped back, and then the fork lowered, so that its curved projection R will enter the annular recess R' in the pinion-hub. The shaft F is provided at its rear end with two bearings or boxes on either side of the bevel-pinion G, which are composed of the upper yoke-piece, S, and the lower yoke-piece, S', which form a housing for the bevel-pinion G, and terminate in a journal-box around the fixed shaft I, and are held together by the bolts and clamp-nuts T.

U indicates a downward projection from the journal-box of the fixed shaft I, last mentioned, through which one of the perpendicular supporting-rods of the rear part of the frame passes. This downward projection or casting is provided with a groove or guide-way, within which is a guide, V, forming a part of the bracket-support W.

W' indicates an annular band-rim, cast upon the bevel-wheel H, and provided with an annular band-recess, within which the brake-band W<sup>2</sup> rests, and is operated by a lever, W<sup>3</sup>, in the usual way.

Recurring to the pinion H', and continuing the description of the gearing, X indicates a large spur-wheel, loose upon the rear axle, Y, and carrying the three bevel-gears Z, which gear on one side with the bevel-wheel a, fixed to the axle, and on the other side to the bevel-wheel a', loose upon the axle and fixed to the traction-wheel b. This gearing, last described,

is of well-known construction, and in common use for the purpose of equalizing the power transmitted to road-wheels for facilitating the turning of corners, and the like, and need not be further described. The shaft I is supported by means of the posts or standards 1, 2, 3, and 4, which carry the shaft-boxes *c* and *d*, and which are firmly secured within the axle-bearings *e* and *f*.

*g* and *h* indicate bracket-guides for the lower ends of the standards, which guides are firmly secured to the boiler. Similar bracket-guides, *i* and *k*, are secured to the boiler above the rear axle, and serve to cap or box the springs *l* and *m*, which rest upon the axle-boxes *e* and *f*. These springs permit motion of the boiler up and down, and prevent shocks in the usual way, while the guide-brackets *g*, *h*, *i*, and *k*, moving upon the posts 1, 2, 3, and 4, serve to steady the boiler in its spring motion up and down.

*n* is a tie-rod designed to prevent the pinion H' from becoming disengaged from the spur-wheel X.

In order to stay the posts 3 and 4 and hold them firmly in place under the strain of operating the machinery, I provide a bracket, *o*, secured to the boiler, and having lugs to which are secured by means of screw-nuts the stay-rods *p*, the rear ends of which are secured one to one end of the fixed shaft I and the other to the top of the post 3.

The bearings of the fixed shaft I are held in place upon the supports 1, 2, 3, and 4 adjustably by means of set-screws *r*, (all of which are not illustrated,) whereby the shaft may be elevated by releasing the screws, and fixed at such a height by means of the set-screws as to ungear the pinion H' from the large spur-wheel X.

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

1. The combination, with the main driving-shaft, of the beveled pinion D, the beveled pinion E, the shaft F, the pinion G, the bevel-wheel H, spur-pinion H', and fixed shaft I and its adjusting mechanism, whereby all the said parts may be disconnected and separated from the gear-wheel, substantially as set forth.

2. The combination of the shaft F and its pivotal supports upon the main driving-shaft, and the shaft I, forming the bearings of the shaft F, and the housings of the bevel-pinions E and G, substantially as set forth.

3. The combination of the lock-fork Q, the shaft F, the pinion E, and the curved projection and recess R and R', substantially as set forth.

4. The combination, with the shafts F and I, of the pieces S and S', constructed and arranged substantially as set forth.

5. The combination of the rear axle, Y, the fixed shaft I, the springs *l m*, the brackets *i k* and *g h*, and the posts 1, 2, 3, and 4, substantially as set forth.

6. The combination, with the axle Y and shaft I, of the posts 3 and 4, and the stay-rods *p*, substantially as set forth.

7. The combination of the pendent guide slotted casting U with the guide V, bracket W, and post 4, substantially as set forth.

In testimony whereof I have hereunto subscribed my name this 10th day of August, A. D. 1882.

EDGAR M. BIRDSALL.

Witnesses:

MARCUS S. HOPKINS,  
C. P. ELWELL.