

(No Model.)

2 Sheets—Sheet 1.

B. F. OPP.  
ROAD ENGINE.

No. 287,709.

Patented Oct. 30, 1883.

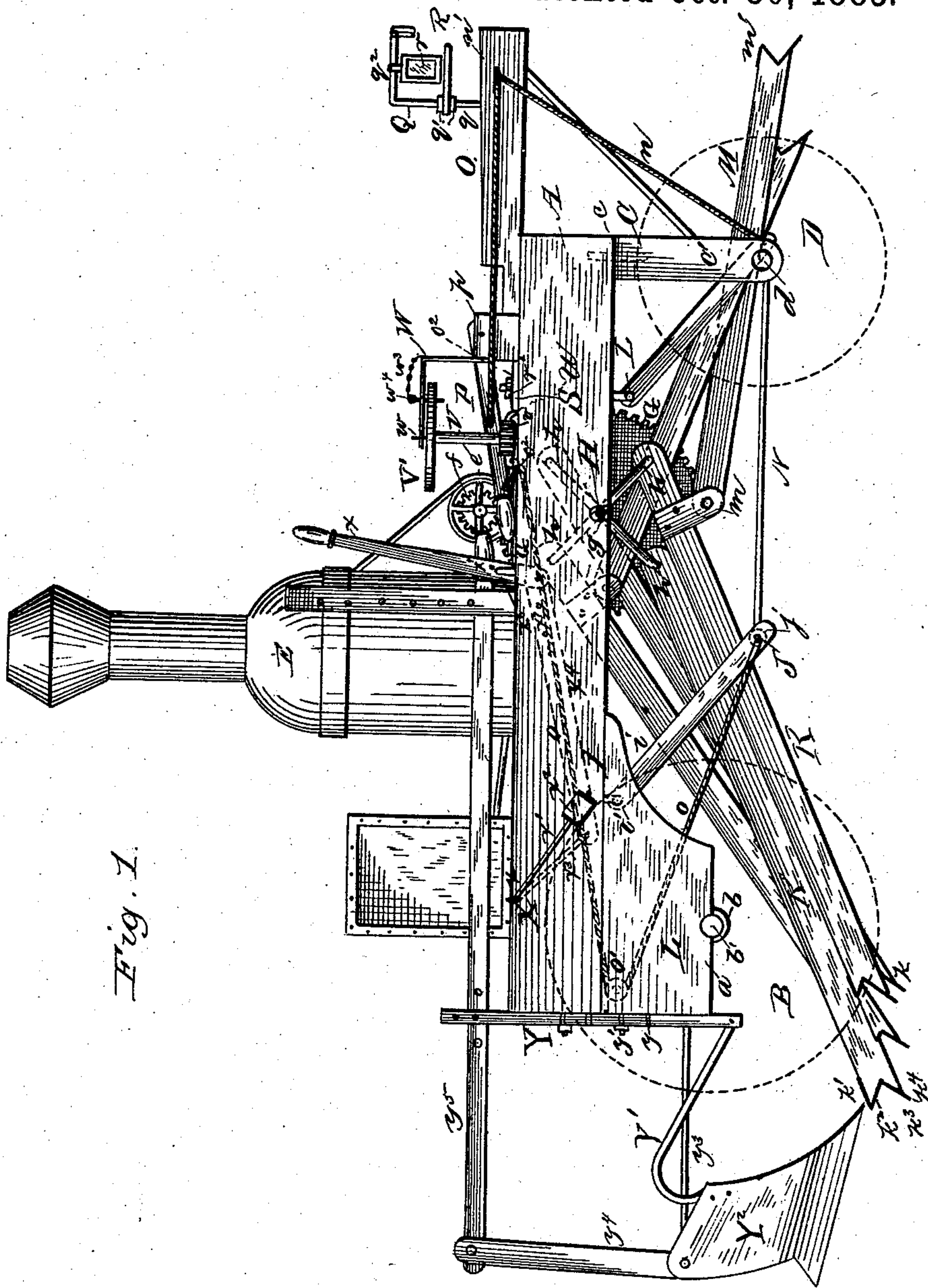


Fig. 1.

Inventor

Benjamin Franklin Opp.

*[Signature]*

Attorney

Witnesses:  
*[Signature]*  
L. C. Hills

(No Model.)

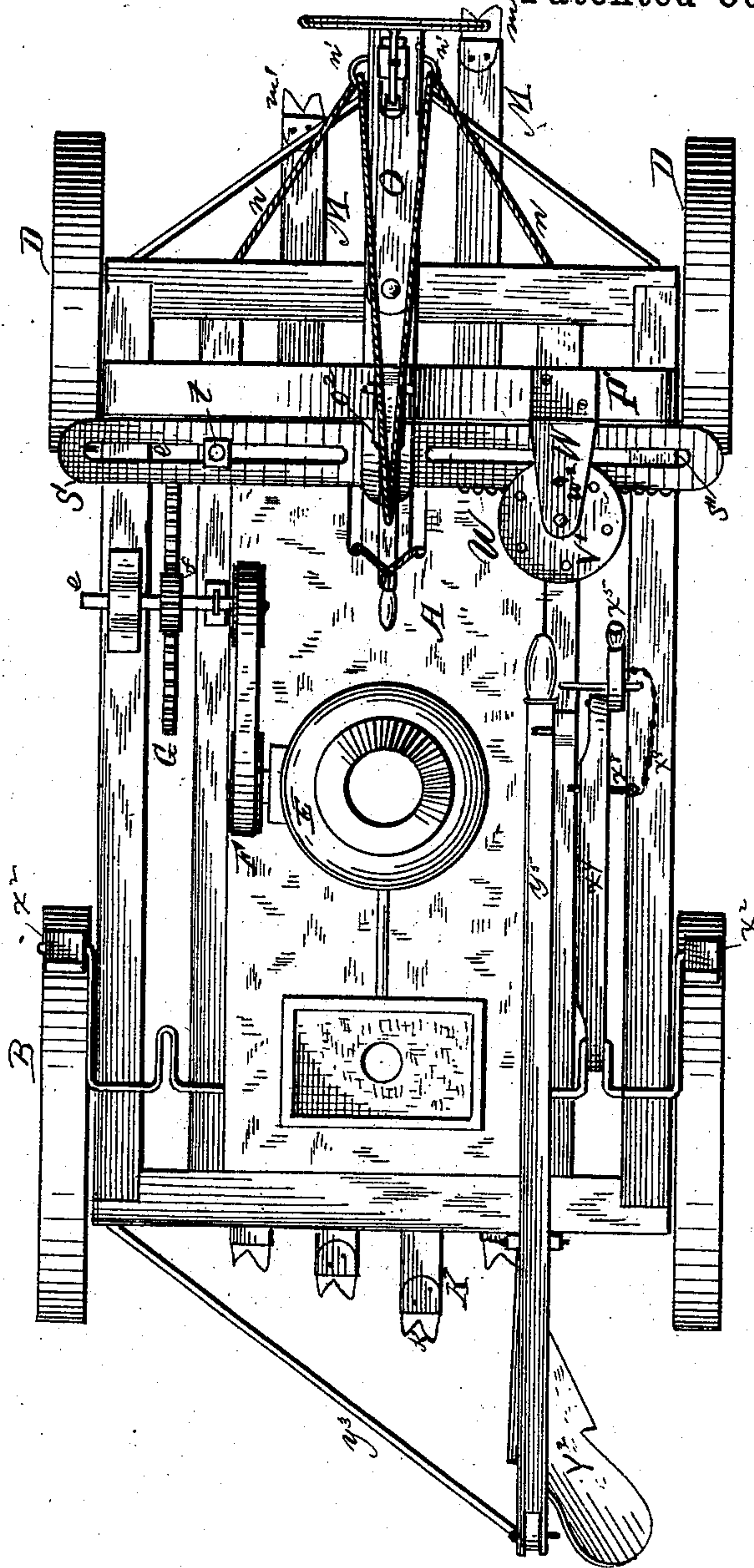
2 Sheets—Sheet 2.

B. F. OPP.  
ROAD ENGINE.

No. 287,709.

Patented Oct. 30, 1883.

Fig. 2



Inventor

Benjamin Franklin Opp.

Witnesses:

W. Johnson  
L. C. Hill

*[Signature]*

Attorney



# UNITED STATES PATENT OFFICE.

BENJAMIN FRANKLIN OPP, OF HAVANA, ILLINOIS.

## ROAD-ENGINE.

SPECIFICATION forming part of Letters Patent No. 287,709, dated October 30, 1883.

Application filed August 14, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, BENJAMIN FRANKLIN OPP, a citizen of the United States of America, residing at Havana, in the county of Mason and State of Illinois, have invented certain new and useful Improvements in Steam Road-Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to road-engines; and it consists of the improved construction, fully described hereinafter, whereby a self-propelled vehicle of comparatively simple and durable construction is secured, the working parts of the same capable of effective and positive operation, and the reversing mechanism for directing the travel entirely under the control of the attendant or engineer.

The invention further consists of the improved devices and combination of parts fully described hereinafter.

In the accompanying drawings, Figure 1 is an elevation of my improved road-engine from the side on which the brake devices are located, the supporting-wheels being shown in dotted lines. Fig.-2 is a plan view.

A suitable frame, A, has extensions *a* at its rear under side, carrying the journal-bearings *b* for the axle *b'* of the rear carrying-wheels, B.

The forward part of the frame A is supported by a truck, C, turning on a central vertical pivot bar or pin, *c*, extending up through the front of the frame A. The truck C has at each lower side extensions *c'*, from which project fixed stub-axles *d*, upon which turn the forward carrying-wheels, D.

Upon the platform A is mounted a steam-boiler, E, and appurtenances for driving a rotary engine, F, the drive-shaft *e* of which carries a pinion, *f*, which slides thereon, but revolves therewith by means of the well-known spline or feather arrangement. Any device (not shown) is to be employed for moving the said pinion *f* along the shaft *e*, so as to throw it into and out of engagement with a cog-wheel,

G, mounted on and revolving with a shaft, H, extending transversely across the under side of the platform A, and having its ends journaled in bearings *g*, secured to the under side of the frame. The said shaft H is arranged to form a series of cranks, *h*, each being of a different radial degree of inclination from the center of the shaft.

A transverse rod, I, is secured to the under side of the frame A for a distance in the rear of the crank-shaft H, and has pivoted to it a series of vertical bars, *i*, separated from each other by a roller which turns on the rod I. The lower ends of the bars *i* are connected together by a rod, J, rollers *j* on the said rod J being interposed between the bars.

Pivotally attached to each crank *h* of the shaft H is a bar, K, of such length as to pass through one of the spaces or divisions between the bars *i*, and projecting a short distance beyond, where it carries a metallic shaped plate, *k*, the upper portion, *k'*, of which rests on the top of the bar, while the angled shoulder formed by the inclined portion *k''* and the lower portion, *k'''*, rests in a correspondingly-shaped recess therefor in the end of the bar K. The lower portion, *k'''*, is notched, to form spurs or points *k''''*, for a purpose to be explained hereinafter.

Depending from the under side of the forward part of the frame, and in advance of the crank-shaft H, is another frame, L, similar to that formed by the rods I and J, the arms *i*, and the rolls *i'* and *j*, and between the spaces or divisions in this frame L are a series of bars, M, similar to the bars K, which are attached at their ends *m* to the said bars K, near the junction of the said bars K, with the cranks *h* of the shaft H. The lower ends of the bars M are provided with plates *m'*, shaped similar to the plates of the bars K. The two depending frames are connected together by a strap, N.

Ropes or cords *n* are attached at each lower end of the front depending frame, and pass up through loops or eyes *n'*, secured to a projecting beam, O, rigidly mounted on the projecting pivot-pin *c* above the platform, and the said ropes are attached to a lever, P, pivotally attached to a bracket, *p*, located centrally on a transverse bar secured to the platform A.



Ropes  $o$  are likewise secured to the lower ends of the rear depending frame, L, pass through loops  $o'$ , secured to the under side of the frame, then through apertures  $o^2$  in the bottom of the frame, and are finally secured to the lever P. The strap and rope connections are so arranged that when one depending frame occupies a vertical position the other depending frame will be inclined.

The forward end of the beam O carries an angled rod, Q, the vertical portion  $q$  of which is connected to the beam O, and is threaded for the reception of nuts  $q'$ , which clamp between them a horizontal plate, R, through which the vertical threaded portion  $q$  passes, and upon which a lantern,  $r$ , rests, which lantern is also connected to the horizontal portion  $q^2$  of the rod Q. The forward end of the portion  $q^2$  is bent laterally, to form a support for a cover or other protector for the lantern.

The rear end of the beam O is provided with an elongated slot,  $o^2$ , in which plays a bolt,  $r'$ , attached to a transverse bar, S, having slots  $s$   $s'$  at each end, through which pass the bolts  $t$   $t'$ , secured to the frame A. Nuts are secured to the threaded ends of the bolts  $r'$   $t$   $t'$ , to prevent vertical displacement of the parts.

The edge of the transverse bar S (on the end in which the slot  $t'$  is located) is formed into a rack, U, with which meshes a pinion,  $v$ , mounted rigidly on a vertical shaft, V, the lower end of which rests in a bearing in the frame A, and the upper end rests in a perforation,  $w$ , in the end of an angle-bracket, W, secured to the bar P'.

A hand-wheel,  $V'$ , is rigidly mounted on the upper end of the shaft V, immediately below its bearing in the bracket W, and is provided near its periphery with a series of perforations,  $v^2$ , adapted to successively register with an opening,  $w^2$ , formed in the horizontal portion of the bracket W.

A chain,  $w^3$ , with pin  $w^4$  attached, is connected to the bracket W, so that the pin can be passed through the opening  $w^2$  of the bracket and one of the perforations  $v^2$  of the hand-wheel, so as to hold the hand-wheel in any position to which it may be revolved.

A shaft, X, journaled in bearings  $x$  on the upper side of the frame A, has its ends  $x'$  dependent, to form brake-levers, which carry square brake-blocks  $x^2$ , clamped thereto, and adapted, when the brake-levers are moved to a vertical position, to bear against the peripheries of the rear wheels. The said brake-blocks can be rotated on the brake-levers, so as to bring their different faces into use as each wears out. The shaft X has a crank-shoulder,  $x^3$ , which is connected by a link-bar,  $x^4$ , with the lower end of a lever,  $x^5$ , pivoted to a bracket,  $x^6$ , secured to the upper side of the platform A. The link-bar  $x^4$  and lever  $x^5$  each have a series of perforations,  $x^7$ , by which means the leverage can be increased or diminished, and a pin,  $x^8$ , attached to a chain,  $x^9$ ,

secured to the lever  $x^5$ , is adapted to be passed through the perforations in the link-bar and bear on the upper face of the frame A, so as to rigidly hold the brake devices in position.

On the rear of the frame A is adjustably secured a vertical arm, Y, having a series of holes,  $y$ , through which the bolt  $y'$  passes, the lower end having pivotally secured to it a curved plow-standard,  $Y'$ , carrying a plow,  $Y^2$ . A diagonal brace-rod,  $y^3$ , is secured to the other side of the frame and to the heel of the mold-board of the plow, and prevents lateral movement of said plow. A vertical link-bar,  $y^4$ , is pivotally connected to the heel of the plow, and also to the end of a horizontal lever,  $y^5$ , pivoted in the upper end of the arm Y.

The operation is as follows: The engine on the platform A is put in motion and the pinion  $f$  on the drive-shaft of the same is moved into contact, meshes with, and drives the cog-wheel G of the crank-shaft H. The same is thereby caused to revolve, imparting a reciprocating motion to the bars K and M in an inclined direction. The crank-shoulders on the shaft H, being of different radial inclinations, cause the bars to successively strike the ground and propel the vehicle, the pointed ends of the plates on the ends of the bars penetrating the earth and preventing their slipping. Owing to the rear depending frame, only the bars K come in contact with the ground; hence the vehicle is moved forward. Now, should it become necessary to reverse the direction of travel, the lever P is shifted, and, through the rope and strap connections, effects the swinging of the rear frame to a vertical position, and the lowering of the front frame resulting in the bars M coming in contact with the ground and propelling the vehicle in a different direction. The rollers in the depending frames facilitate the movements of the bars K and M through the same. When it is desired to turn a curve or travel in a circular path, the hand-wheel  $V'$  is revolved, causing the pinion  $v$ , meshing with the rack U, to move the bar S transversely across the frame, which moves the beam O, turns the pivot  $c$ , and swings the truck. The hand-wheel can be maintained in this position by the chain and pin before described. By means of the link and lever connections at the rear the plow is under the control of the operator.

From the foregoing description it will be apparent that the vehicle is of simple and durable construction, effective and positive in operation, the reversal of the direction of travel secured without interfering with the continuous working of the engine, and the various parts capable of ready application and adjustment.

I claim—

1. The combination, in a road-engine, of a pivoted projecting beam at the front end thereof, and connected to the swiveled supporting-truck, and carrying at its forward end an angle-bracket, from which a lantern and cover



therefor are suspended, and a vertical adjustable base-support connected to the bracket, substantially as set forth.

2. The combination, in a road-engine, of a  
5 hand-wheel mounted on a vertical shaft and controlling the movements of a swivel-truck supporting the front end of the engine, the upper end of said vertical shaft bearing in an angle-bracket having an opening adapted to  
10 register with similar openings in the hand-wheel, and a pin capable of being passed through said openings, substantially as set forth.

3. The combination, in a road-engine, of a  
15 vertically-adjustable arm, Y, curved standard

Y', pivotally secured to its lower end and carrying the plow, diagonal brace-rod  $y^3$ , link-bar  $y^4$ , and horizontal lever  $y^5$ , substantially as set forth.

4. The combination, in a road-engine, of a 20 crank-shaft, X, lever and link-bar for oscillating the same, and depending ends carrying the square brake-blocks  $x^2$ , capable of rotation on their axis, substantially as set forth.

In testimony whereof I affix my signature in 25 presence of two witnesses.

BENJAMIN FRANKLIN OPP.

Witnesses:

JOHN H. SCHULTE,

HARMON R. NORTRUP.