

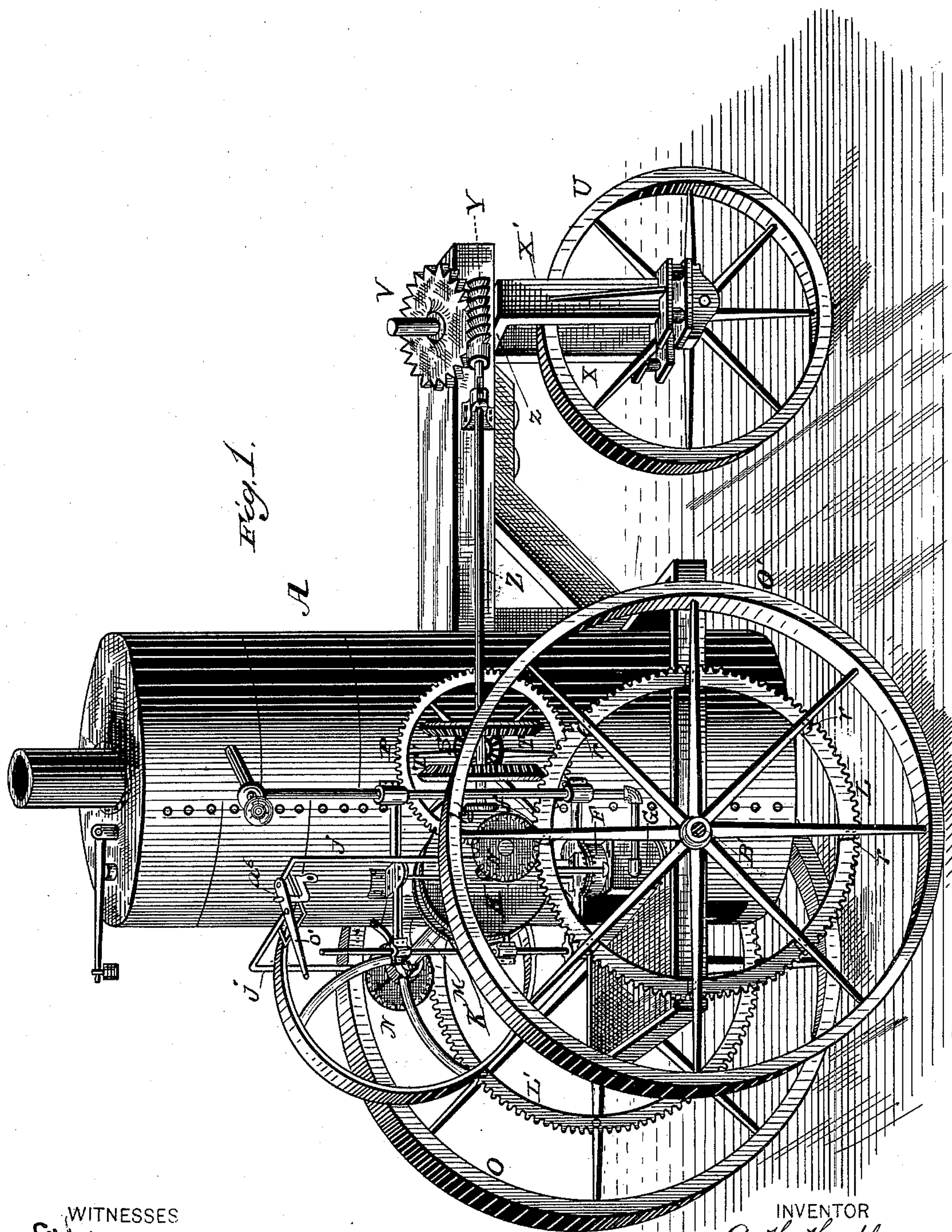
(No Model.)

4 Sheets—Sheet 1.

A. H. HAFLEY.
TRACTION ENGINE.

No. 302,841.

Patented July 29, 1884.



WITNESSES
John T. Morrow.

INVENTOR
A. H. Hafley.
by Anderson & Smith
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(No Model.)

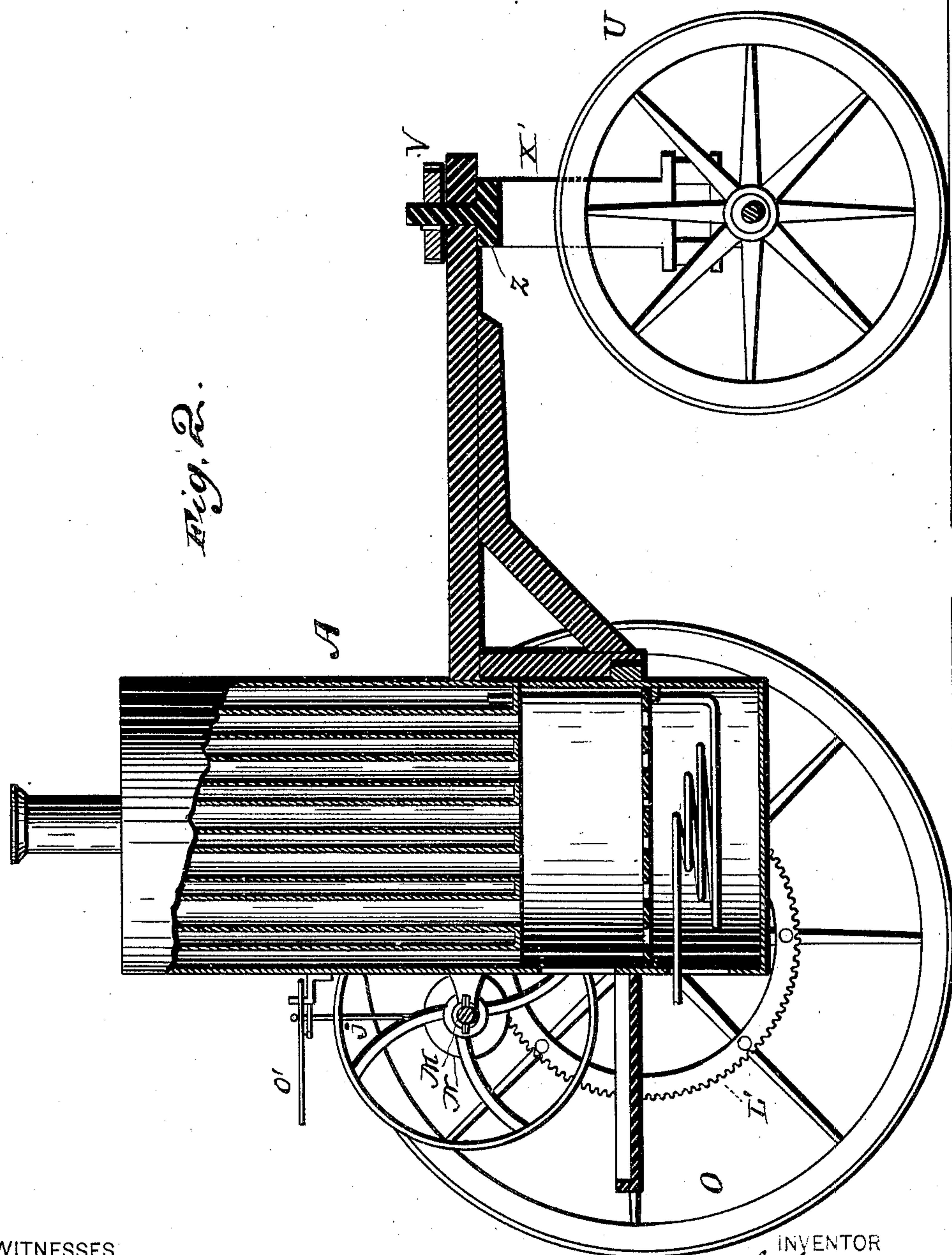
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WITNESSES
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A. C. Massi

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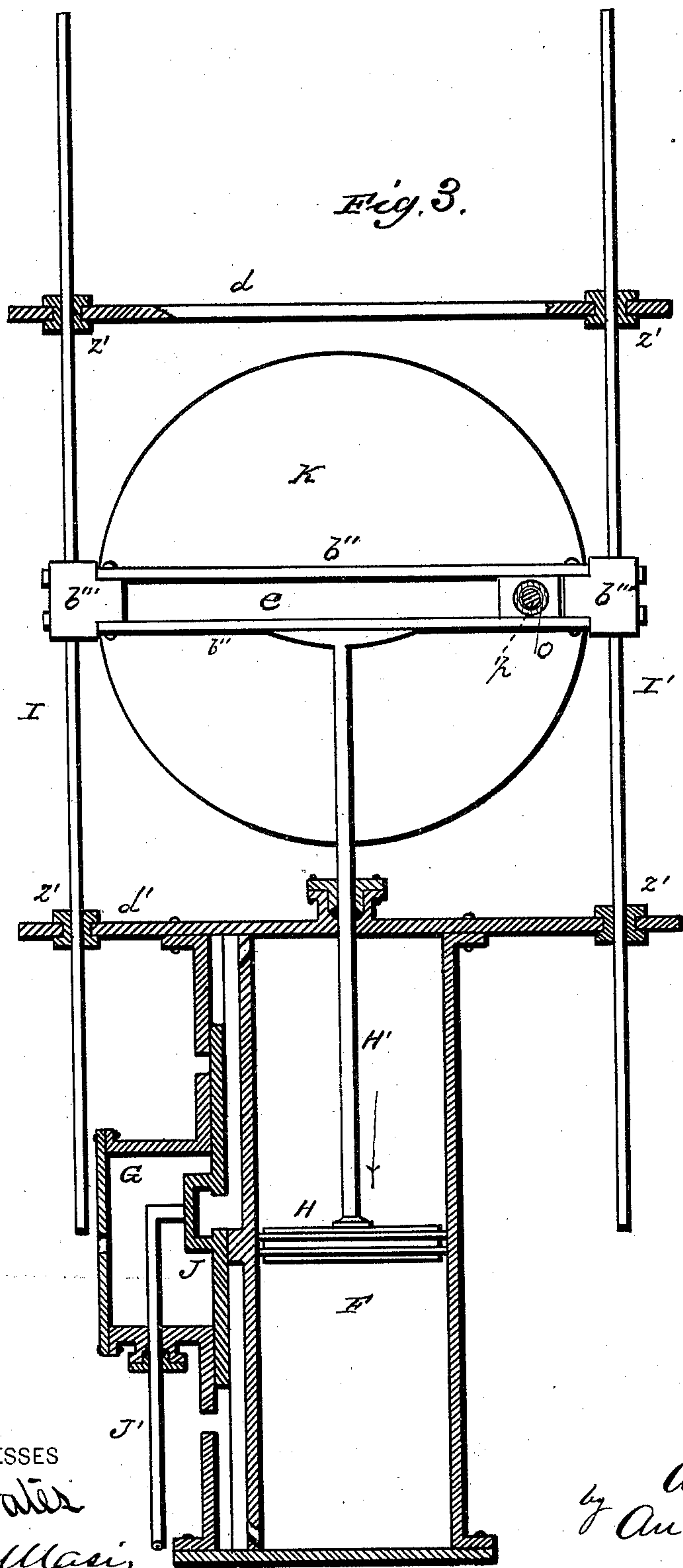
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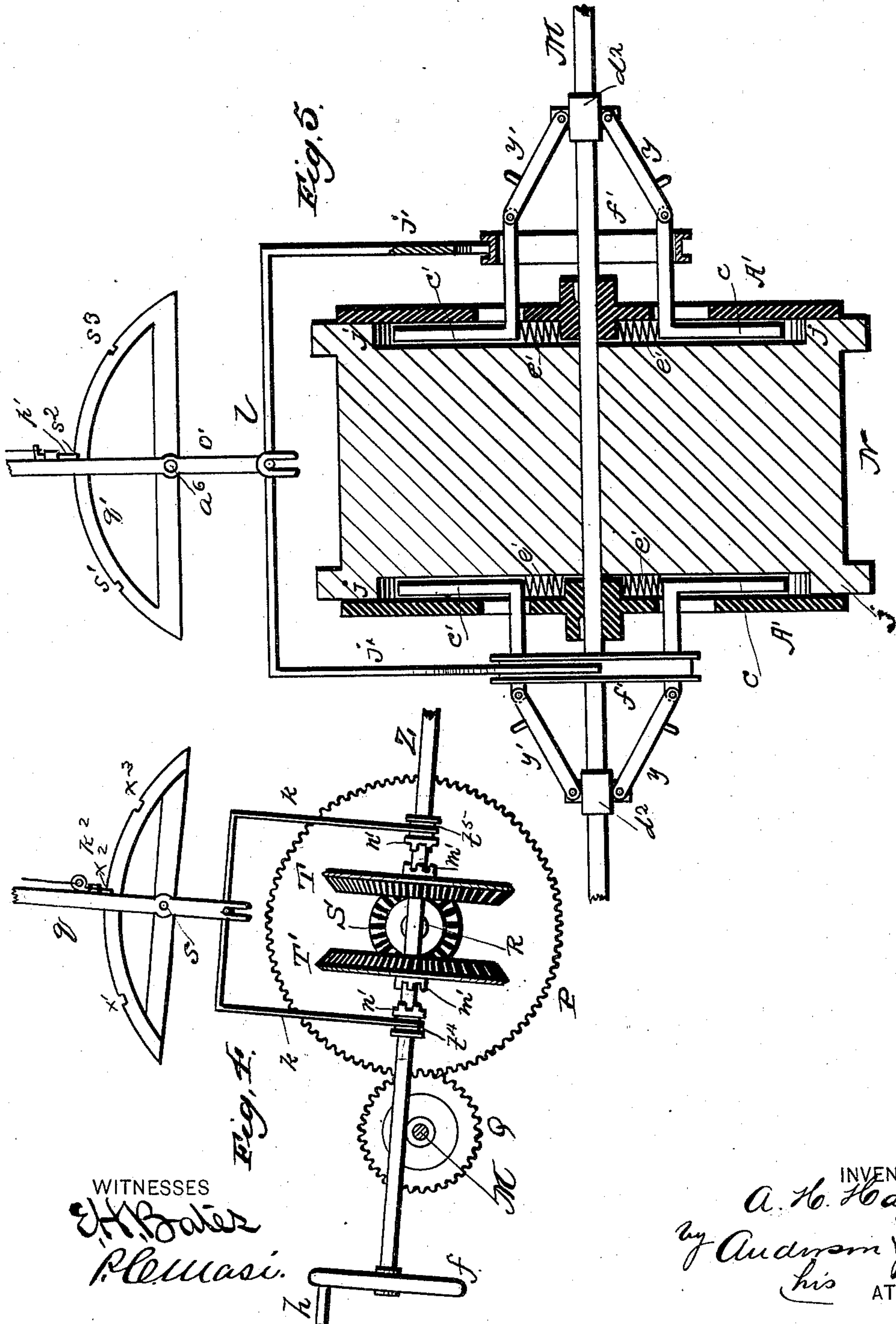
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UNITED STATES PATENT OFFICE.

ADAM H. HAFLEY, OF ASHLEY, ILLINOIS.

TRACTION-ENGINE.

SPECIFICATION forming part of Letters Patent No. 302,841, dated July 29, 1884.

Application filed April 28, 1884. (No model.)

To all whom it may concern:

Be it known that I, ADAM H. HAFLEY, a citizen of the United States, residing at Ashley, in the county of Washington and State of Illinois, have invented certain new and useful Improvements in Traction-Engines; and I do 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.

Figure 1 of the drawings is a perspective view of my traction-engine. Fig. 2 is a vertical sectional view of the same. Fig. 3 is a vertical sectional view of the cylinder, steam-chest, &c. Fig. 4 is a detail view of the steering mechanism, and Fig. 5 is a transverse section of one of the lantern-wheels.

This invention has relation to improvements in traction-engines; and it consists in the novel arrangement and construction of devices, as will be hereinafter fully described, and particularly pointed out in the claims appended.

In the accompanying drawings, the letter A represents an upright boiler.

F is the steam-cylinder, and G the steam-chest; H, the piston; H', the piston-rod; J', the valve-rod; and J is the sliding valve, which may be of any approved construction.

To the outer end of the piston-rod H' are secured narrow iron plates b''. These plates are secured at their ends to blocks b''', which are secured to the vertical guide-rods I I' in such a manner as to leave a slot, e, between the plates, and in said slot is placed a tubular or hollow shaft, o, capable of sliding in the slot. The guide-rods I I' move vertically in the boxes z', these boxes being secured and connected by the cross-pieces d d'. The plates b'' b'' are inclosed between the two wheels K, which consist of two circular solid disks centrally secured to a horizontal shaft, M. These wheels are connected at points near their circumference by a pin, p, which passes through an aperture in the center of the tubular or hollow shaft o. The pin p fits so closely in the shaft o as to cause no jarring, but not so

closely as to cause much friction. By this construction, as the piston-rod ascends and descends, it will, through the wrist-pin, which will slide back and forth in the slot e, impart rotary motion to the wheels K. The lantern-wheels N, whose cogs engage the teeth of the wheels L L', turn loosely on the shaft M at its extremities. The wheels N are made to rotate by mechanism hereinafter to be described. The wheels L L' are secured to the spokes of the rear wheels, O O', of the carriage by outwardly-curved pieces, the centers of the wheels L L' being in the axis B' of the wheels O O'. Each of the lantern-wheels N are provided on each of their faces with a flange, j, extending around their circumference, so as to leave a recess portion in each face. The inner sides of these flanges are provided with ratchet-teeth, which are inclined in opposite directions. The circular plates A' are keyed to the shaft M and rotate therewith.

In the recessed portion of the face of each wheel N are situated, above and below the shaft two pawls, c c', adapted to engage the teeth in the recess of the wheel N. These pawls pass through slots in the plates A', and are pivoted at their outer extremities to links y y', the links being hinged at their farther ends to a collar, d'', fitted to the shaft, and capable of being moved in the direction of the length of the shaft.

Between the pawls c c' and the hubs on the plates A' are springs e', which are designed to throw the said pawls in engagement with the teeth of the wheel N.

Arranged loosely upon the horizontal portion of the pawls c c' are grooved rings f', in which the shifting-rod is free to rotate. To these rings are loosely secured the vertical rods j' j', having forked ends, the pairs being situated on opposite sides of each wheel, and connected above the lantern-wheels N by a cross-bar, l. At the middle of this cross-bar is pivoted the lever o'. This lever is similar to the reversing-lever of a locomotive, and is pivoted, as at pivot a'', having its lower end forked to engage a pin on the bar l, and is capable of being set in any one of three positions by means of the circular arc q', provided with three notches, s' s'' s''', and the

dog p' , adapted to fit in these notches. When the lever is set at s' , the pawl on the right of the trundle-wheel will engage in the teeth of the flange, and if the shaft is rotating in the proper direction the motion given to the pawl will be transmitted to the trundle-wheel N, and through it to the wheels of the carriage. When the engine is reversed and the carriage-shaft M is turned in the opposite direction, the lever o' is set at s'' , and the pawl on the left of the trundle-wheel is thrown into engagement with the teeth on the opposite side of the wheel N. These teeth being inclined in the opposite direction to those on the right of the wheel, they will transmit the opposite rotary motion of the plates A' to the trundle-wheel N. When the lever o' is set at s'' , none of the pawls $c c'$ are in engagement, and the engine may be used for driving other machinery.

Between the crank-wheel K and the lantern-wheel N is centrally fixed on the axis M the small wheel Q, whose teeth engage the teeth of the wheel P, turning on the axis R. This wheel has a bevel-pinion, S, on its outer face, whose teeth engage the teeth of two bevel-wheels, T T', which turn loosely on a shaft, Z. This shaft projects forward to a point above the guide-wheel U, and terminates in an endless screw, Y, whose thread engages the teeth of the horizontal wheel V. The axis of the wheel V is secured to the cross-piece z , connecting the supports X X', which pass down on each side of the wheel U, so that when the toothed wheel V is turned the guide-wheel U will be turned with it. The shaft Z has fixed at its rear a vertical wheel, f , having a handle, h , by which means the wheel V may be turned by hand, and with it the guide-wheel U in either direction. By means of the bevel-wheels T T' and connected gearing and levers, the guiding may also be done by steam. Two clutches, $n' n'$, capable of sliding on the shaft Z, and provided with collars $t^4 t^5$, may be thrown in or out of engagement with the corresponding clutches, $m m'$, on the wheels T T' by mechanism hereinafter to be described. The portions of the shaft on which the clutches $n' n'$ slide are polygonal in cross-section, so that when one of them is in engagement with the corresponding wheel the rotation of the wheel will cause the shaft Z to turn, and through the

connected mechanism will turn the guide-wheel one way or the other, depending on which clutch is thrown into engagement with those on the wheels T T'. These clutches are thrown into engagement by means of the rods k , forked at their lower ends, the fork fitting over the collars $t^4 t^5$, and pivoted to the lever q , which is pivoted at s . The lever is similar to the reversing-lever of a locomotive, having a spring-dog which is capable of set in any one of the three notches $x' x'' x'''$, provided at the rear portion, the middle, and the forward portion of the circular arc k'' , so that the lever may be set in either the first or last of these positions, and either of the clutches be thrown into engagement with its adjacent wheel. When the lever is set at the middle notch, x'' , neither clutch is in engagement, and the bevel-wheels T T' turn loosely on the shaft Z without imparting any motion to it.

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

1. The combination, with the trundle-wheels N, turning loosely on the shaft M, and provided with flanges j , and recesses in the sides, said recesses being provided with ratchet-teeth in contrary directions on the opposite faces of the wheel, of the circular plates A' , keyed to the shaft M, the pawls $c c'$, links $y y'$, collars d^2 , fitting loosely on the shaft M, slide collars $f' f'$, bar L, having forked ends J, and lever o' , substantially as and for the purpose set forth.

2. The combination, with the wheel Q, fixed on the driving-shaft M, of the wheel P, having a bevel-pinion, S, and two bevel-wheels, T T', turning loosely on the shaft Z, and having clutches $m m'$ on their outer faces, of the clutches n' , which rotate with the shaft Z, endless screws y , wheel V, and the mechanism for throwing the clutches n' in and out of engagement with the clutches $m m'$, consisting of the rods pivoted to the lever q , substantially as and for the purpose set forth.

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

ADAM H. HAFLEY.

Witnesses:

PHILANDER A. CARTER,
JOHN D. SEIBERT.