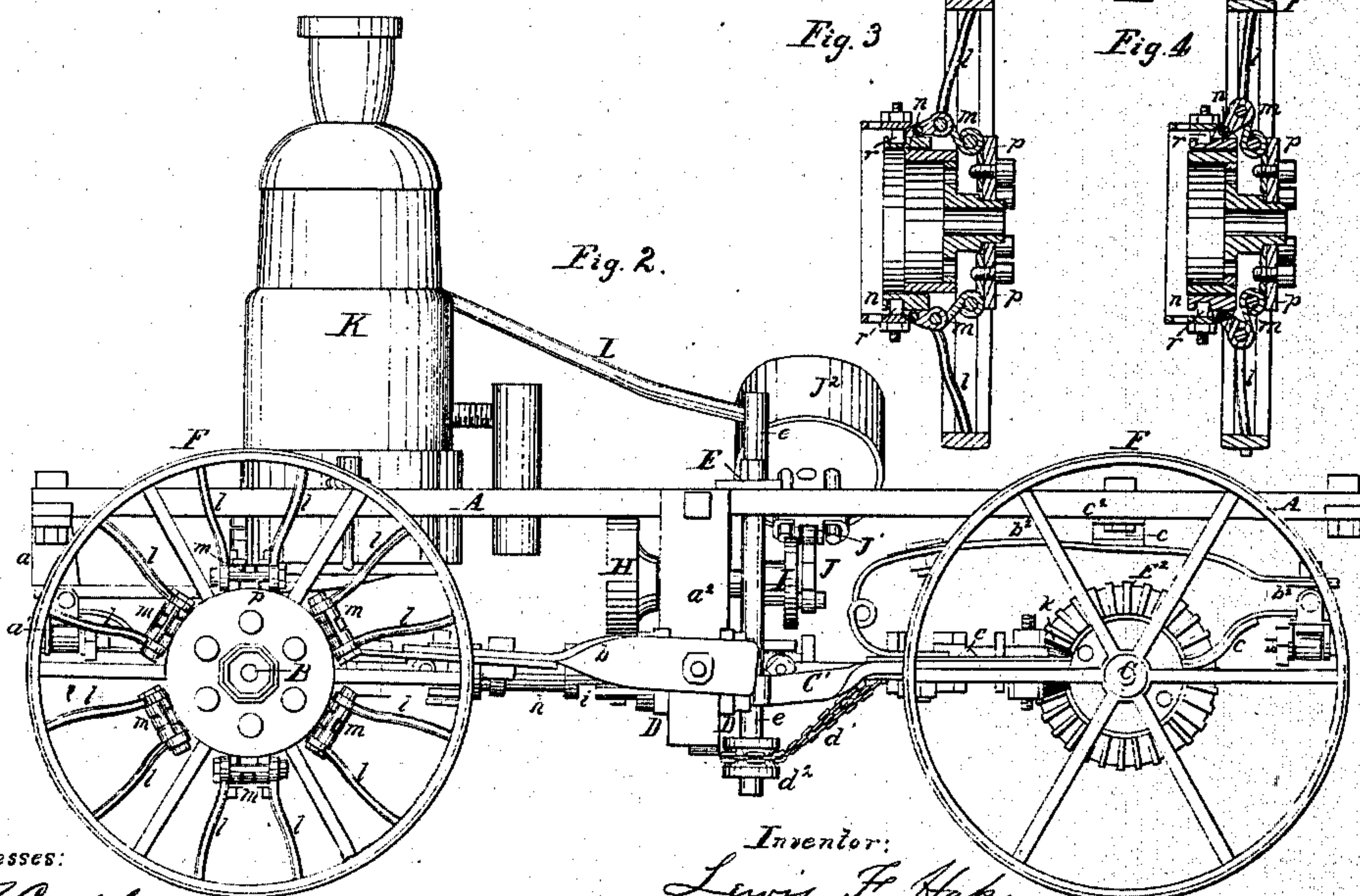
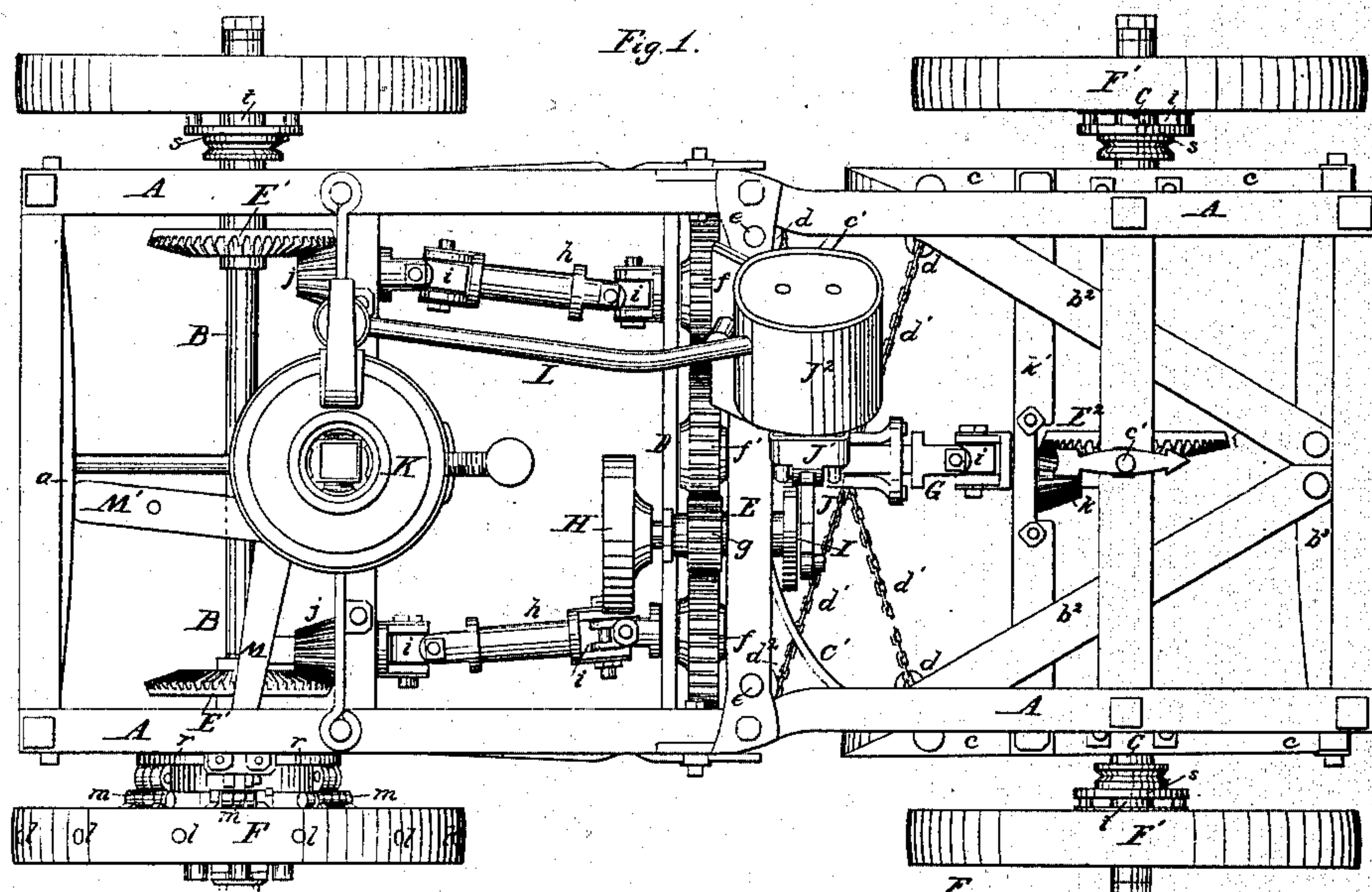


L. F. HAKE.  
LAND CONVEYANCE.

No. 62,264.

Patented Feb. 19, 1867.



Witnesses:  
R. T. Campbell  
Edw. Schaffer

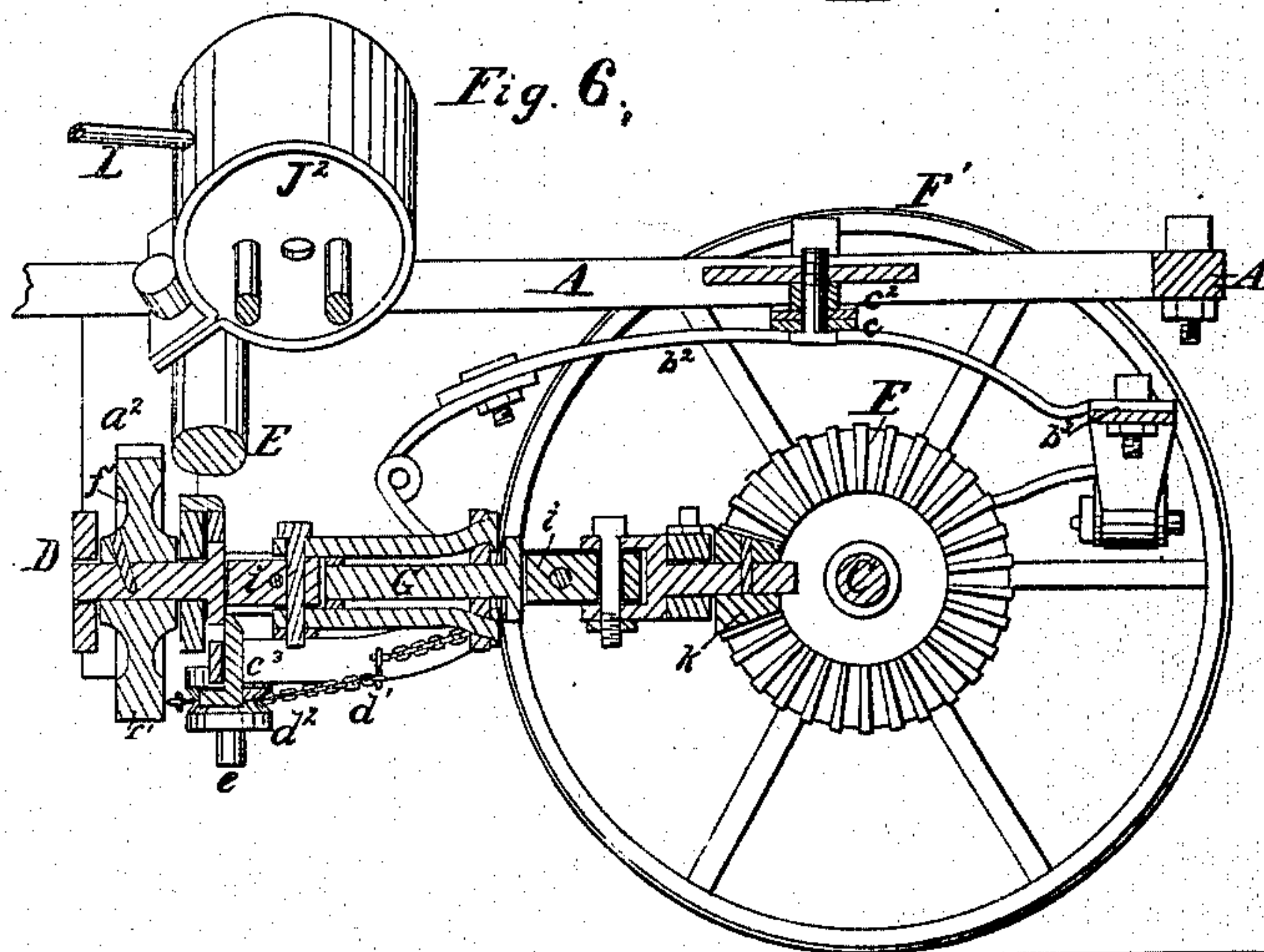
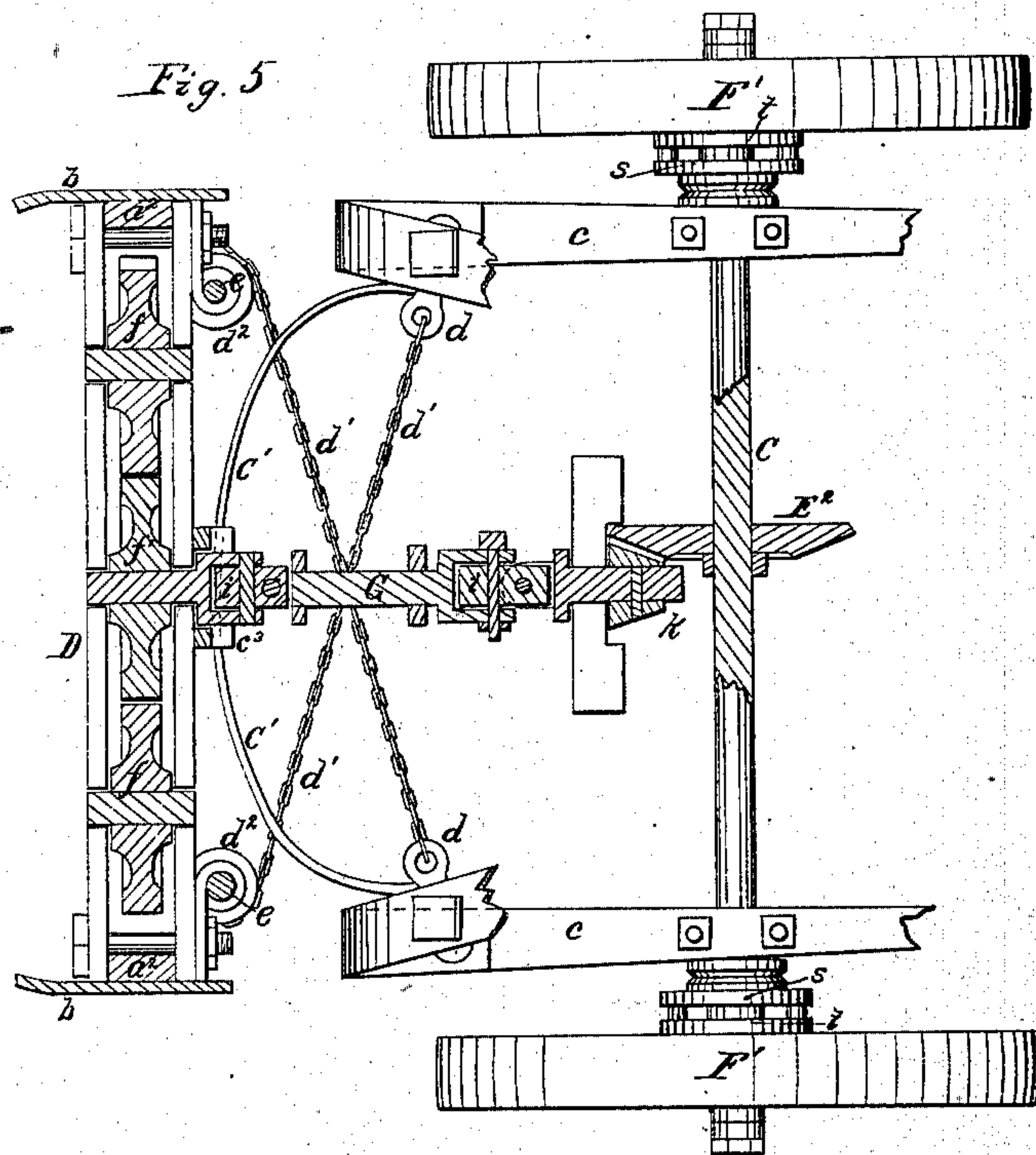
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Lewis F. Hake  
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*Edw. A. Hager*

Inventor:  
*Lewis F. Hake*  
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# United States Patent Office.

LEWIS F. HAKE, OF SALEM, OHIO.

*Letters Patent No. 62,264, dated February 19, 1867.*

## IMPROVEMENT IN LAND CONVEYANCE.

The Schedule referred to in these Letters Patent and making part of the same.

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, LEWIS F. HAKE, of Salem, Columbiana county, State of Ohio, have invented certain new and useful Improvements in Steam Land Conveyances; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a plan view of the steam land conveyance.

Figure 2 is an elevation of one side of the same.

Figures 3 and 4 are diametrical sections through one of the traction-wheels, showing the traction-spurs in two positions.

Figure 5, sheet 2, is a horizontal sectional view of the front part of the carriage, showing the mode of making the guide-wheels driving-wheels.

Figure 6, sheet 2, is a vertical central section of fig. 5.

Similar letters of reference indicate corresponding parts in the several figures.

The main object of my invention is to so construct a steam carriage for common roads that the entire framework and the driving machinery, together with the engine and boiler, can be mounted upon springs, and motion communicated to the transporting-wheels by means of flexible or compensating connections, thereby preventing injurious jars and shocks being communicated to said machinery, and affording an easy-running carriage, as will be hereinafter described.

Another object of my invention is to provide for making the forward guide-wheels as well as the rear wheels driving-wheels, at the same time to allow of a free movement being communicated to the shaft of said wheels in guiding the machine, as will be hereinafter described.

In the accompanying drawings, A represents a rectangular frame, which is supported at its rear end upon two semi-elliptic springs  $a a'$ , the lower one,  $a'$ , of which is connected by links to two goose-necks that are secured to bearings through which the axle B passes. The forward portions of said goose-necks are prolonged so as to connect with pendants,  $a''$ , which are secured to the sides of frame A, near the middle of its length. These forward extensions  $b$ , of the goose-necks, form longitudinal braces and also flexible connections of the axle with said pendants. The forward end of said frame A is supported by means of springs,  $b^2 b^2 b^3$  and  $c$ , upon the forward axle C, as shown in figs. 1 and 5; the two longitudinal springs  $c c$  extend across the axle C, and are bolted to bearings through which this axle passes. These two springs have attached to their ends the two diagonal springs  $b^2 b^2$ , and transverse spring  $b^3$ , and to the two diagonal springs the transverse spring  $c^2$  is secured. A king-bolt,  $c^1$ , passes vertically through the transverse spring,  $c$ , and through a transverse spring,  $c^2$ , which is secured to the frame A, and thus connects the front axle C to this frame by a pivot joint, which will allow this axle to be turned to the right or left for guiding the carriage. In order to keep the axle C, in its proper central position, and to steady the spring frame which is interposed between it and the frame A, I employ a segment,  $C'$ , which is secured at its ends to the rear ends of the longitudinal springs  $c c$ , so as to be concentric to the vertical axis of the king-bolt  $c^1$ ; this segment I connect to a transverse frame, D, by means of a staple,  $c^3$ , as shown in figs. 5 and 6, which staple will allow the segment to slide freely through it either to the right or left hand, as may be required in guiding the machine. Two eyes,  $d d$ , are bolted to the rear ends of the springs  $c c$ , and have attached to them the ends of a chain,  $d^1$ , which is crossed and passed around grooved pulleys,  $d^2$ , on the lower ends of vertical rods,  $e e$ , which rods have their bearings on the front side of the transverse frame D, and also in a cross-bar, E; these rods  $e e$  should have crank-arms or wheels upon their upper ends, so that a person upon the frame A can turn them and thus move the axle C when he desires to guide the machine or to turn it around. The transverse frame D consists of two transverse bars which are rigidly bolted to the pendants  $a''$ , and adapted to serve as bearings for three large spur-wheels,  $f f' f$ , and also for a pinion spur-wheel,  $g$ , which latter has its bearings sufficiently elevated for it to engage with the two wheels  $f f'$ , as shown in fig. 1. The shafts  $h h$ , of the two spur-wheels  $f f$ , have universal or gimbal joints,  $i i$ , applied to their extremities, and on the rear ends of these shafts  $h h$ , bevel pinion spur-wheels  $j j$  are keyed, which engage with the teeth of large bevel spur-wheels  $E' E'$ , on the axle B, as shown in fig. 1. By these means the wheels  $f f$  are caused to turn said axle and with it the rear driving-wheels F F, when these wheels are clutched to their axle, and while



this is the case the jointed shafts *h h* will, by their flexure, allow freedom of motion to the frame A, without causing any strain or binding of the shaft at its joints. The central or intermediate spur-wheel *f'* communicates motion to the bevel spur-wheel *k*, which has its bearings in the centre of a transverse bar, *k'*, by means of an extensible shaft, G, which is also provided with gimbal or universal joints, *i i*. This bevel-wheel *k* engages with the teeth of a large bevel-wheel, *E*<sup>2</sup>, which is keyed to the middle of the length of the front axle C, and transmits motion from the wheel *f'* to this axle in whatever position this axle may be adjusted. The shaft G is made extensible, so that it will accommodate itself to the obliquity given to the front axle C, in guiding the machine. The gimbal joints *i i* serve the same purpose on the shaft G as the gimbal joints on the rear driving-shafts *h h*. The short shaft of the pinion driving-wheel *g* carries on one end a balance-wheel, H, and on the other end a crank-wheel, I, to the face of which latter a pitman-rod, J, is connected which receives its motion from the cross-head J<sup>1</sup> of an engine, J<sup>2</sup>. This engine is suitably secured to the carriage frame and driven by means of steam which is generated in an upright boiler, K, located near the rear end of frame A, and suitably supported thereby. The steam pipe L, which forms a communication between the steam chest of the engine and the boiler, may be made flexible, so that the jars and concussions in travelling over rough roads shall not open the joints and allow steam to escape. The transporting-wheels F F', which are applied to the forward and rear axles B and C, are constructed with smooth-surfaced felloes, which are perforated to receive through them a number of radial rods, *l l*, which are applied to knuckle joints *m m* that are pivoted to the circumference of two sliding collars, *n p*, upon the hubs of the wheels. The inner collars *n* are constructed with annular grooves in their peripheries, in which rings or yokes, *r*, are fitted loosely, as shown in figs. 3 and 4. These rings *p* have yoked levers, M, pivoted to them, which levers are pivoted to vibrating arms M' in such manner that the two collars *n* can be moved up to or from the collars *p* at pleasure. When the collars *n* are moved toward the collars *p*, the knuckle joints *m m* will project the ends of all the rods *l l* beyond the circumference of their respective wheels, as shown in fig. 4, thus enabling these wheels to hold firmly to the surface of the ground in rolling over it. The inner ends of the hubs of the wheels F F' are chambered for receiving within them the clutch plates *s t*, by which said wheels can be affixed to or made loose upon their shafts at pleasure.

In the accompanying drawings I have only represented one of the transporting-wheels adapted for a traction-wheel, but in practice both front and rear wheels will have the extensible rods *l l* applied to them, as described above. The mode of communicating motion to the guide-wheels from the engine, which I have above described, enables me to make these guide-wheels driving-wheels, and to rotate their axle at all times without having the driving-gear work hard. The entire machinery which is used to move the carriage can be properly housed in so as not to be exposed to injury, and the guiding apparatus as well as the levers for operating the traction-spurs can be arranged so that it can be worked from the top of the carriage by the person who rides thereon. The frame A may be constructed of wood or metal, and while I prefer to mount it upon its forward and rear axles, as I have herein shown and described, still, the supporting springs may be differently arranged without changing the principle of my invention.

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

1. In combination with the frame of a land conveyance, which is mounted upon springs and adapted for sustaining the motive power and driving-gear, I claim the use of gimbal-jointed shafts for transmitting motion to the axles of the transporting-wheels, substantially as described.
2. The use of the gimbal-jointed and extensible shaft G for communicating motion to the forward axle of the guiding wheels, substantially as described.
3. Supporting the forward part of the frame A upon the guiding axle by means of springs, when said axle is sustained in part by a sliding segment, and operated by means substantially as described.
4. The arrangement of the jointed driving-shafts G, *h h*, beneath the spring frame A, substantially as described.
5. The application of extensible rods *l l* to the transporting-wheels of a land conveyance, said rods being so applied that they can be made to protrude beyond the circumference of the wheels or drawn within the same at pleasure, substantially as described.
6. Constructing the inner ends of the hubs of the transporting-wheels with recesses which are adapted for receiving the clutch-plates *s t*, substantially as described.

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Witnesses:

R. H. GARRIGUES,  
NORMAN B. GARRIGUES.