

M. A. HALSTEAD:

## Improvement in Traction Engines.

No. 119,138.

Fig. 1.

Patented Sep. 19, 1871.

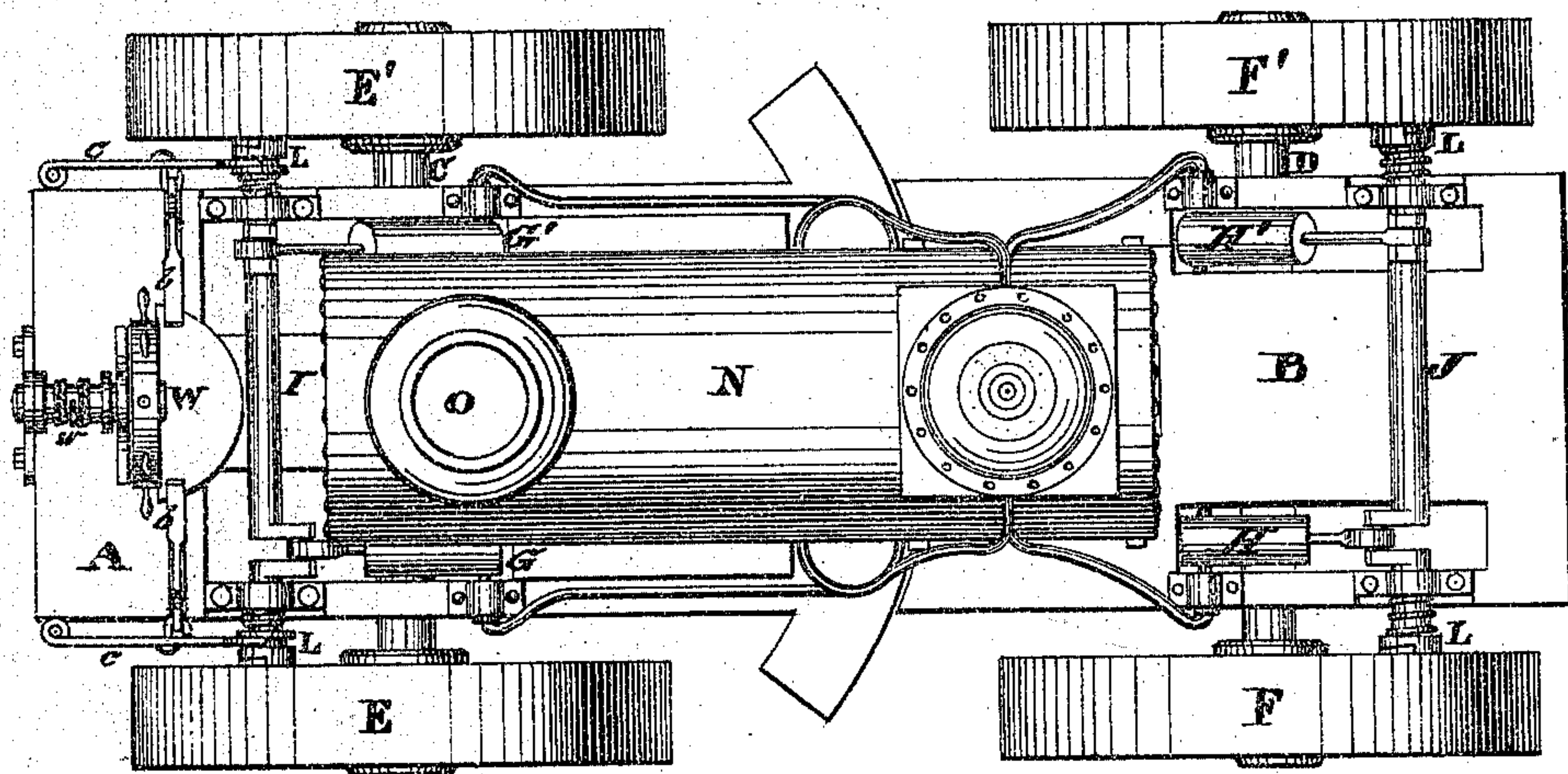


Fig. 2.

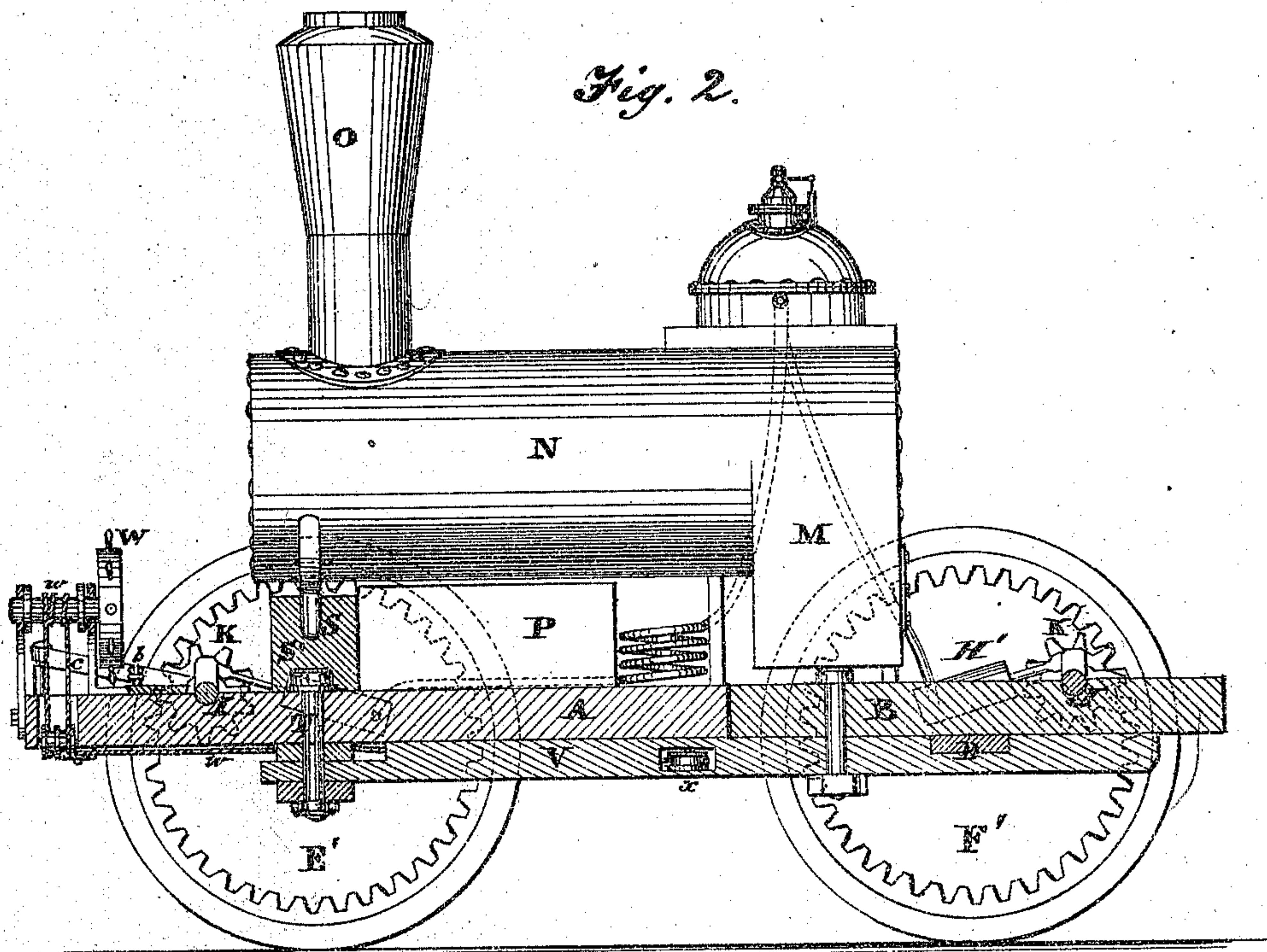
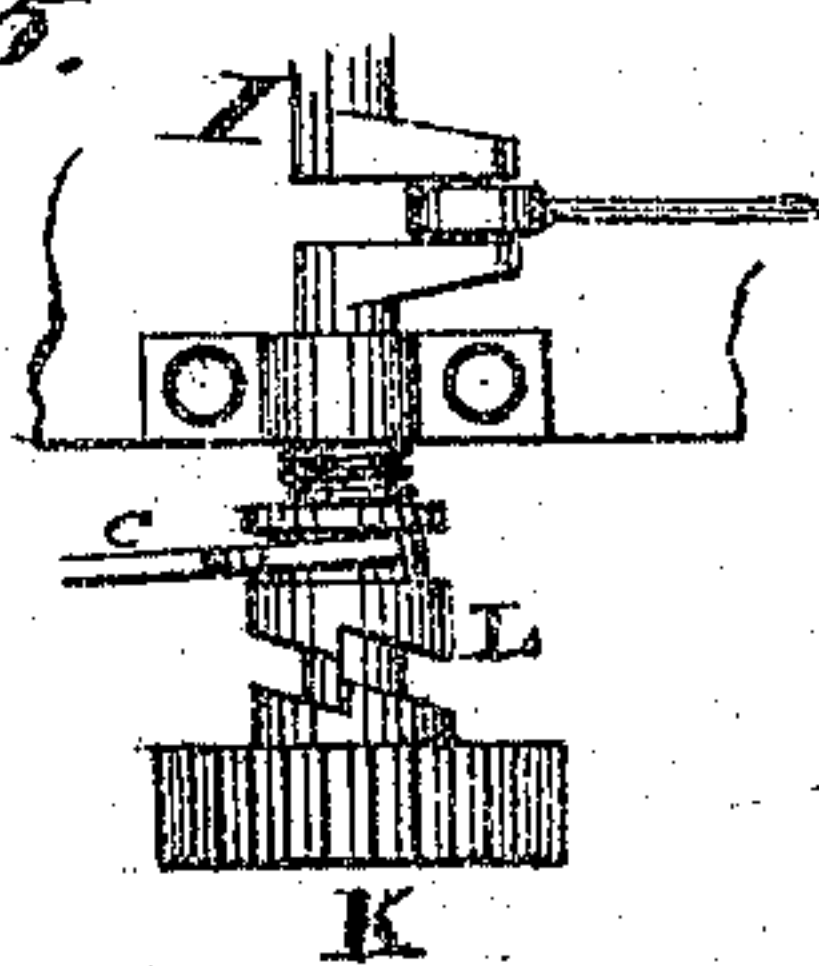
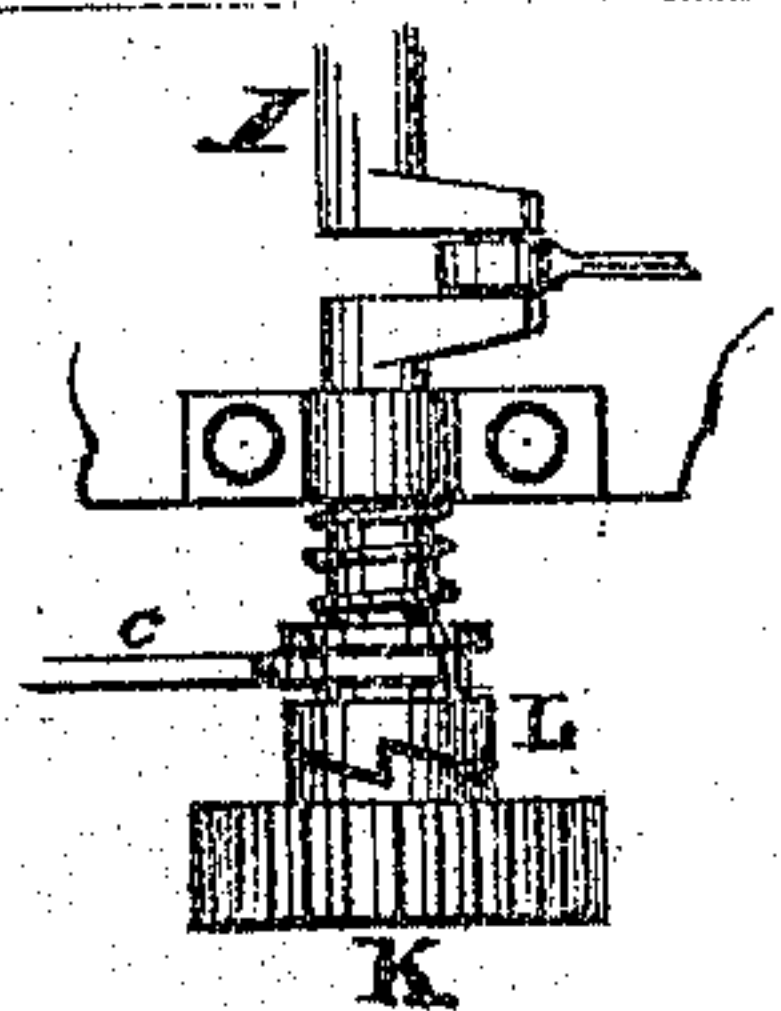


Fig. 3.



WITNESSES

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Fig. 3.

Patented Sep. 19, 1871.

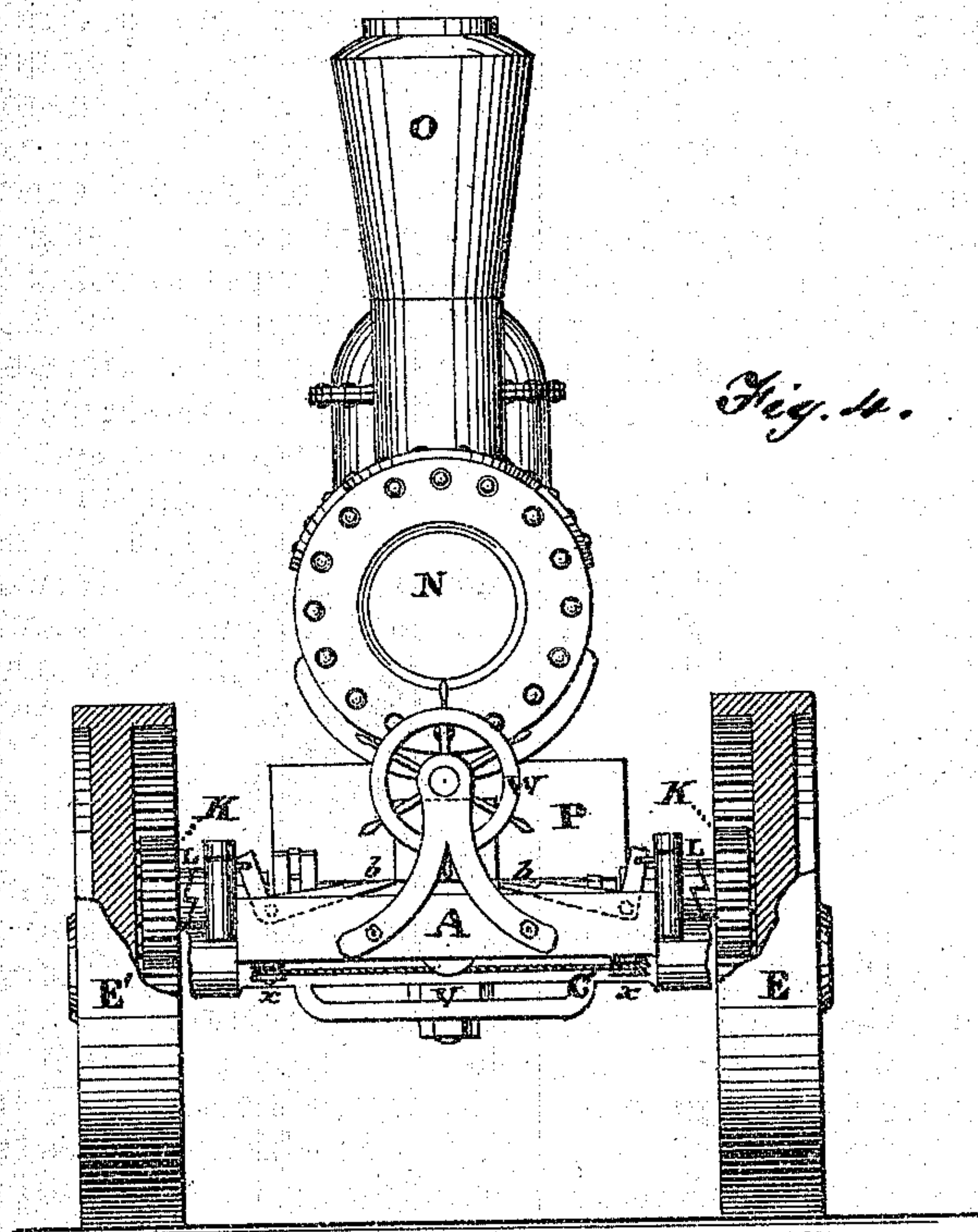
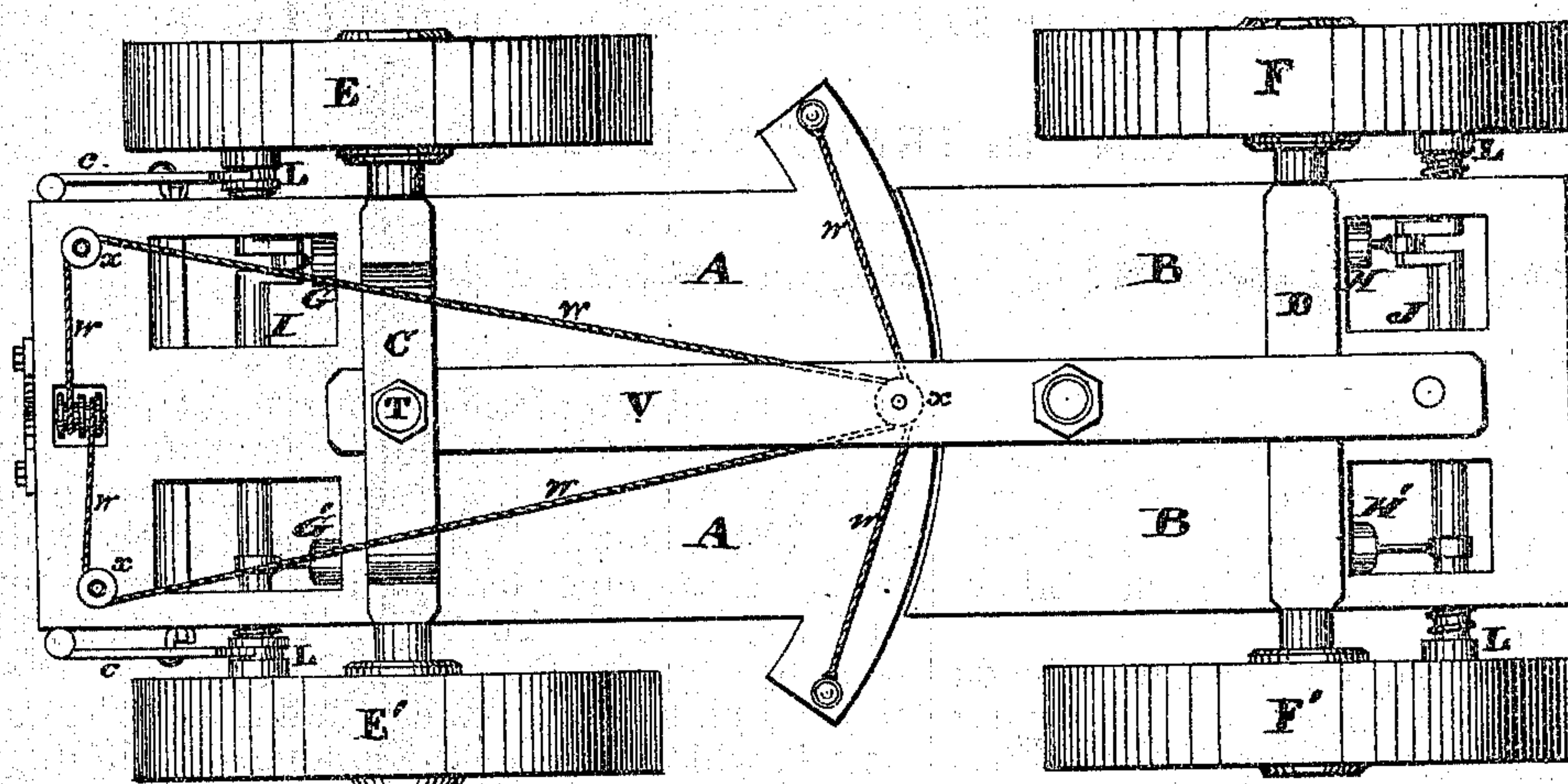


Fig. 4.

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# UNITED STATES PATENT OFFICE.

MELVIN A. HALSTED, OF SAN FRANCISCO, CALIFORNIA.

## IMPROVEMENT IN TRACTION-ENGINES.

Specification forming part of Letters Patent No. 119,138, dated September 19, 1871.

*To all whom it may concern:*

Be it known that I, MELVIN A. HALSTED, of San Francisco, county of San Francisco and State of California, have invented a new and Improved Traction-Engine, of which the following is a specification:

This is a locomotive adapted for drawing loads upon ordinary roads, for rolling and solidifying road material, and for other purposes. The improvements refer to several points: First, the mode of jointing the fore to the hind portion of the carriage-bed, so as to give the forward part an aptitude for turning to swerve the course of the vehicle. Second, the steering devices. Third, the adaptation of oscillating-engines to the purpose. Fourth, the clutches for giving independent connection of the fore-engines with one or both of the fore carriage-wheels. Fifth, the automatic clutch arrangement to give facility in turning. Sixth, the pinions on the driving-shafts actuating internal gears on the driving-wheels, which rotate upon their axes.

In the accompanying drawing, Figure 1 is a top view of the traction-engine looking downward. Fig. 2 is a partly side view or elevation and partly longitudinal central vertical section. Fig. 3 is a view of the under side of the engine looking upward. Fig. 4 is a front end elevation. Fig. 5 shows a detached view of one of the clutches in its respective position.

The same letters refer to like parts in the different figures.

A is the fore carriage-bed, and B that of the hind carriage. The axle-trees C D of these bed sections are fast to their respective beds and do not rotate. The fore driving-wheels E E' and hind driving-wheels F F' rotate freely and independently of each other on the respective axle-trees. The fore carriage and the hind carriage, A and B, have each a pair of oscillating-engines, those of the fore carriage being represented at G G', operating the forward driving-axle I, and those of the hind carriage at H H', operating the driving-axle J. There are as many steam-cylinders as wheels, but the said cylinders are grouped in pairs, two to a driving-shaft. The four driving-wheels are independent, the internal gear of each being engaged by its own pinion K, which is thrown into or out of gear with its appropriate shaft by means of a clutch, L, shown particularly at Fig. 5. The clutches on the fore driving-shaft

are operated automatically or by foot triggers and levers; those on the hind driving-shaft are automatic, as will appear presently. M is the fire-box; N, the boiler; O, the chimney; P, the water-tank. R are pipes leading from the steam-dome to the cylinders. The forward end of the boiler rests by a pintle, S, upon a block, S', the axis of the said pintle being exactly in line with the king-bolt T, which secures the hounds or coupling V of the hind carriage to the fore carriage. The king-bolt T is the vertical axis of revolution of the fore carriage A in turning. The whole of the boiler preserves a constant relative position with the hind carriage B, the fore end swiveling upon the block S' on the fore carriage. The rear end of the floor of the fore carriage A is of a segmental form, the curve being struck from a center coincident with the axis of rotation of the fore carriage in turning, so that the break is but slight, the floors of the two sections of carriage being about continuous. The segments are extended laterally, as shown at *a a*, so as to maintain the length of bearing on each side when the fore carriage is on a haw or a gee lock. The fore carriage is moved by a steering-wheel, W, which operates by means of a cord or chain, *w*, passing over suitable guide-pulleys X on the fore carriage and on the coupling-bar V to eye-bolts on the under side of the segment at *a a*.

The steersman or conductor stands in front of the boiler and behind the wheel, in which position he has within easy reach the treadles *b b*, by which the clutches L on the forward driving-shaft are operated. For instance, if the conductor wishes to turn the traction-engine haw, he places his foot upon the near treadle *b*, which vibrates the lever *c* and withdraws the clutch L from its partner on the pinion K which engages the internal gear of the near driving-wheel of the fore carriage. The near driving-wheel now ceases to operate as a driver, and the power of both engines G G' is concentrated upon the off driving-wheel, which thus assists in the work of turning. The inverse operation turns the traction-engine gee. The foot is placed on the off treadle, disconnecting the driving-shaft from the off driver and throwing the power of the engines upon the near driver. The movable section of each clutch is kept home against the pinion section of the same by means of a spring, except when forcibly withdrawn by the treadle movement, or, under certain circumstances, in



turning. When the vehicle is turning the wheels describing the outer circle traverse the greater distance, and, consequently, rotate more rapidly than the wheel describing the inner curve. In this case the wheel on the outer circle is dragged around at a greater rate than the inner one, the inclines of the clutch slipping upon each other. The movable section of each clutch slides on a feather on the driving-shaft. The other section of the clutch and the pinion to which it is attached run free on the shaft when not in engagement with the said movable section.

I claim—

1. In a traction-engine the division of the floor on a segment line, substantially as and for the purpose described.

2. In combination with a fore carriage, constructed as stated in the first claim, the steering-gear.

3. The combination of the oscillating-engines, two-crank shaft, pinions, and independent wheels, substantially as described.

4. The combination of the clutches L L, pinions K K, and independent driving-wheels, substantially as described and represented.

5. The combination of the divided floor, driving-shafts, oscillating-engines, steering-gear, disconnected driving-wheels, and clutch mechanisms.

To the above specification of my improvements in traction-engines I have set my hand this 5th day of July, 1871.

M. A. HALSTED.

Witnesses:

OCTAVIUS KNIGHT,  
JAS. L. EWING.