F. E. CULVER.

Road-Engine.

No. 212,839. Patented Mar. 4, 1879.

Fig. 1.

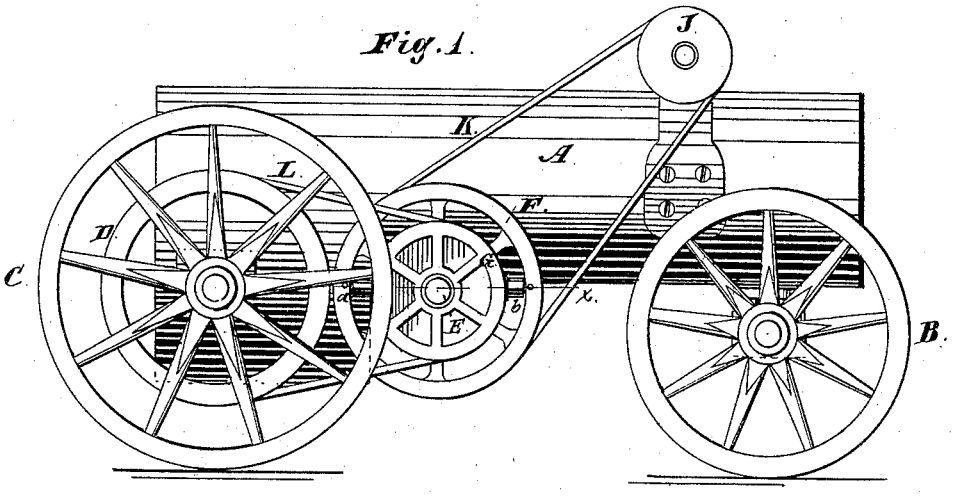


Fig. 2.

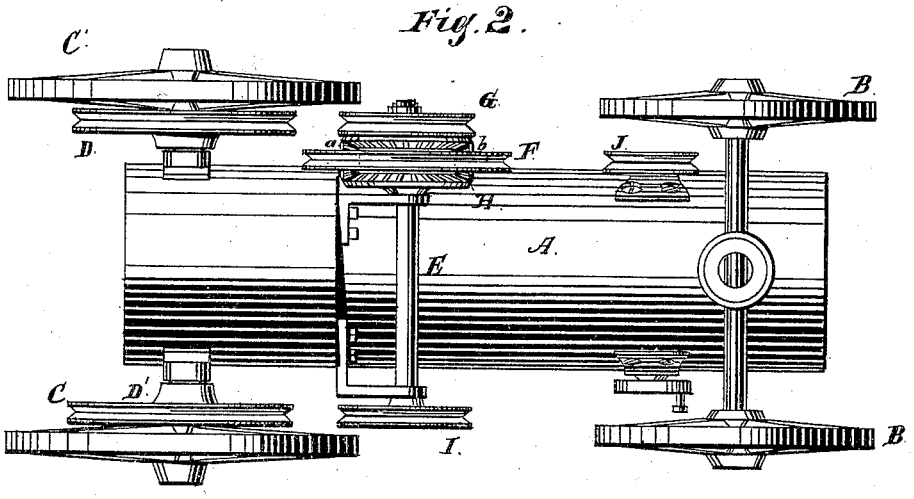


Fig. 3.

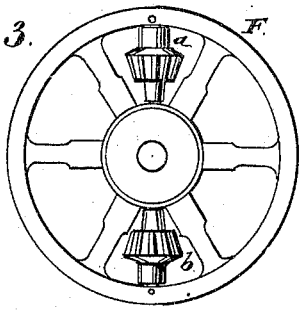
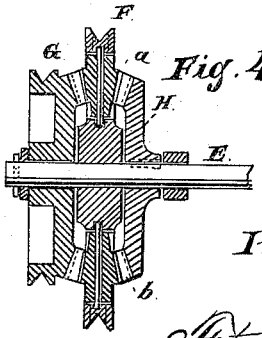


Fig. 4.



Witnesses.

H. L. Bruno.

C. W. Bond.

Inventor:

Fitz E. Culver.

UNITED STATES PATENT OFFICE.

FITZ E. CULVER, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN ROAD-ENGINES.

Specification forming part of Letters Patent No. **212,839**, dated March 4, 1879; application filed September 14, 1878.

To all whom it may concern:

Be it known that I, FITZ E. CULVER, of Chicago, Cook county, State of Illinois, have invented a new and useful Improvement in Self-Propelling Portable or Farm Engines, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation; Fig, 2, an under-side view; Fig. 3, a detail; Fig. 4, a sectional view of the parts shown, taken at *x* of Fig. 1.

My improvement relates to self-propelling portable engines, such as are adapted to farm use. As such engines are usually constructed, the two rear wheels, which support the boiler and engine, and which are the driving-wheels, rotate each on a spindle attached to the side of the boiler; and when the machine is moved from place to place the power is applied upon one side to a secondary shaft, from which it is transmitted to the driving-wheels.

In turning, and at other times from other causes, the resistance of the two driving-wheels is not equal, and it is desirable to prevent undue strain upon some parts, that the power be distributed and equalized as varying circumstances may require.

The object of this invention is to secure a proper distribution and equalization of the power in engines constructed as above described, which I accomplish by means of devices located upon the secondary shaft, and combined with the driving-wheels, as more fully hereinafter described.

In the drawings, A represents the boiler. The engine proper is not shown; but it may be located upon the boiler, as usual. The boiler is mounted on four wheels. The two front wheels, B, are upon an axle centrally pivoted to the front end of the boiler. The two rear wheels, C C′, are the driving-wheels, each of which rotates on a spindle secured to the boiler.

D D′ are wheels or pulleys permanently secured to the wheels C C′, respectively, and adapted to receive V-shaped belts. E is a shaft located beneath the boiler, and rotating in suitable bearings secured thereto. F is a loose wheel on the shaft E. *a b* are small beveled pinion-wheels, each of which rotates on a shaft secured to the wheel F. One end of each such shaft is secured to the hub of the wheel, the other end to the rim. G is another wheel loose on the shaft E. It is provided with bevel-gear on the inside, which engages with the pinions *a b*. H is another wheel, permanently secured to the shaft E. It also has bevel-gearing on the inside, which engages with the pinions *a b*. I is a pulley-wheel permanently secured to the shaft E. J is a pulley upon the engine-shaft.

As shown, F, G, I, and J, as well as D and D′, have grooved edges, adapted to receive V-belts. K is a belt which passes over J and F. L is another belt over G and D, while a third belt passes over I and D′. The wheels F G H and pinions *a b* serve the purpose, among other things, of distributing and equalizing the power as required by varying conditions.

In use, power is applied from the engine to the wheel F through the belt K. This wheel F is connected with the fixed wheel H and with the loose wheel G by means of the two pinions *a b*. When F rotates, H and G must rotate together if the resistance of the two wheels C C′ is the same, and the rotation of H will rotate the shaft E, and with it the wheel I, through which motion will be given to the wheel C′. At the same time the rotation of G will give motion to C. When the resistance of the two wheels C C′ is equal, the pinions *a b* serve the purpose of connecting G and H with F, and these three wheels F G H move together and operate the same as though they were all rigidly secured to the shaft E. If, however, from any cause the same amount of power is not required upon each of the wheels C C′, the pinions *a b* can rotate, and the power will be properly distributed and equalized, and the strain upon the several parts will be substantially the same. The two wheels C C′ can move at different velocities, and without slipping or unduly straining any of the parts.

I have shown and described belts for driving the several parts, but do not limit myself to them.

I am aware that equalizing devices have been applied to the axle of a road-engine; but in my invention the entire equalizing-gear is placed on a secondary shaft, which is pro-

vided with wheels to connect by belts with pulleys on the rear wheels, these wheels being mounted on spindles secured to the boiler.

What I claim as new, and desire to secure by Letters Patent, is as follows:

In a road-engine, the secondary shaft E, arranged in bearings under the boiler, and carrying the loose wheel F, with pinions *a b*, the loose wheel G, and fixed wheels H I, in combination with the driving-wheels C C′, mounted upon spindles secured to the boiler, and provided, respectively, with the pulleys D D′, substantially as and for the purposes herein set forth.

FITZ E. CULVER.

Witnesses:
O. W. BOND,
H. F. BRUNS.