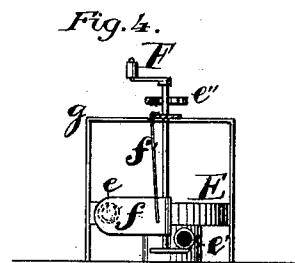
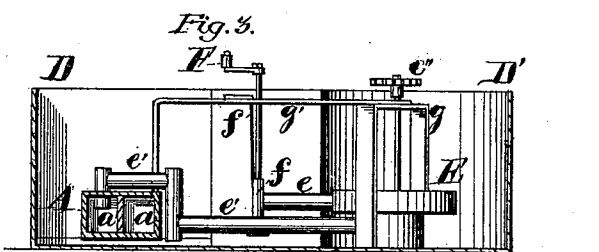
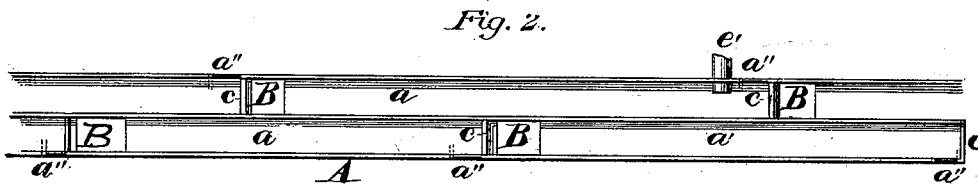
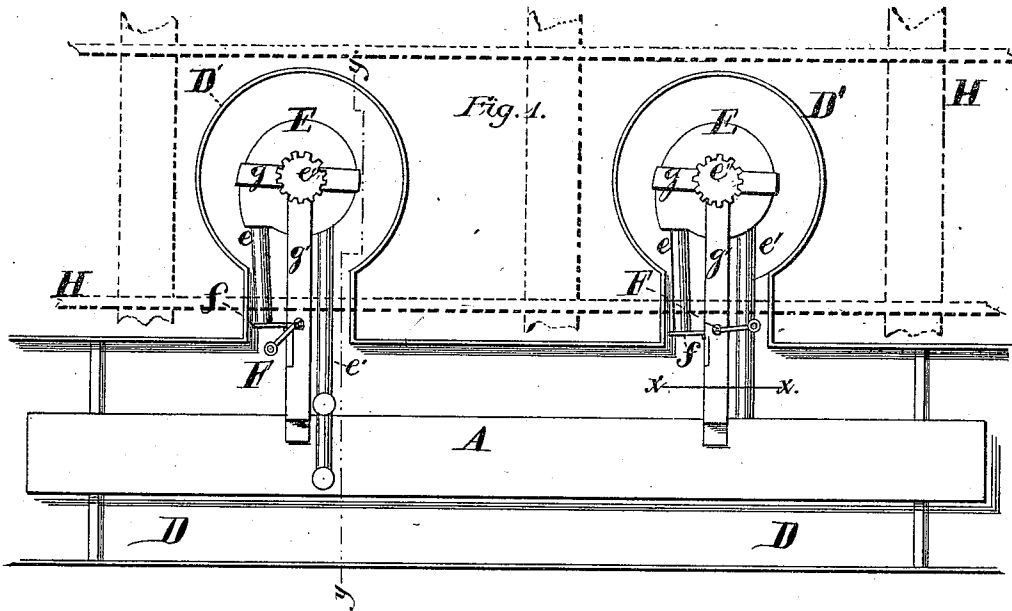


J. W. D. ECKLES.
PROPELLING CARS.

No. 177,229.

Patented May 9, 1876.



Witnesses:
Wm. H. Burton
Robt. M. Barr.

Inventor:
John W. D. Eckles.
By *Leahy & Leary* atty.

UNITED STATES PATENT OFFICE.

JOHN W. D. ECKLES, OF HARMONY GROVE, ASSIGNOR OF ONE-THIRD HIS RIGHT TO JAMES W. CARTER, OF WALNUT GROVE, AND ONE-SIXTH TO BERRY B. DOBY, OF LITHONIA, GEORGIA.

IMPROVEMENT IN PROPELLING CARS.

Specification forming part of Letters Patent No. 177,229, dated May 9, 1876; application filed April 10, 1875.

To all whom it may concern:

Be it known that I, JOHN W. D. ECKLES, of Harmony Grove, in the county of Jackson and State of Georgia, have invented certain new and useful Improvements in a Mode of Motion and Device for Propelling Vehicles, &c.; 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improved mode of motion and device for the propulsion of vehicles, such as cars, &c., by means of the various principles and appliances constituting my invention, as hereinafter specified and claimed.

In the drawings, Figure 1 represents a plan view of my invention; Fig. 2, a plan view, with the top removed, of a section of my invention, showing one form and arrangement of a system of tubes or chambers wherein a vacuum is formed automatically, as will hereinafter more fully appear. Fig. 3 is a sectional view of my invention, taken on the line *y y*: Fig. 4, the same taken, on the line *x x*.

A is an air-tight casing, either containing or divided into tubes *a a'*, substantially as shown in Fig. 2. Each tube *a* or *a'* is of sufficient length to extend over a territory rising or falling a distance of sixty-six feet, for reasons which will hereinafter more fully and at large appear. B B are openings at the deflected end of the tubes *a* or *a'*, and at the elevated extremity of each tube is provided a valve or gate, *a''*. Consecutive tubes are divided from each other by suitable diaphragms or partitions *c*, in order that each tube may be separate and act independently.

D is a trough or race, of suitable construction and material, which is intended to contain and carry the water necessary for the operation of my invention. This race D may be made open or closed, excepting when it is desired to conduct the water up over an elevation, when it is made air-tight, and closed until, beyond said elevation, a point is reached

that is below the original level. In this case the race D, acting as a siphon, will carry its water over and beyond said elevation.

E E are turbine water-wheels, one of which must be provided at or near the elevated extremity of every tube or chamber *a* or *a'*. Each water-wheel E is provided with its feed-pipe *e*, vent-pipe *e'*, and gear-wheel or pinion *e''*. Each feed-pipe *e* is closed by the valve or gate *f*, which is operated to open or shut the feed-pipe *e* by the crank-lever F and spring *f'*. The water-wheels, with their different appliances, as mentioned, are fixed and retained in proper position and relation to each other by suitable frame-work *g g'*, or its equivalent. H is a track or tramway on which the vehicle to be propelled must travel. This track is so situated that each pinion or gear-wheel *e''* shall come midway between the rails, as shown in Fig. 1.

Proceeding, now, with a description of the operation of the race D, tubes or chambers *a a'*, and the turbine water-wheels, it will first be necessary to demonstrate as touching the tubes *a a'*. As hereinbefore specified, these tubes are constructed of a length sufficient to extend over a territory having a rise or fall of sixty-six feet. It is a well-known philosophical fact that the barometric column of water is, in round numbers, thirty-three feet in height. One of my tubes or chambers *a a'* would (though it might extend a mile or much more) represent an altitude of sixty-six feet, as heretofore specified.

It must be understood and remembered that the casing A, with its contained parts, as well as the casings of the turbine water-wheels E, are submerged in the contained water of the race D, which is supplied by suitable means. Now, if the gate or valve *a''* of a tube, *a* or *a'*, be opened, the water will rush in and fill said tube. If, now, the valve *a''* be closed air-tight, as it must be, the water will not all escape through the vent B, but, on the contrary, inasmuch as said vent B is entirely submerged in the water of the race D, there will remain exactly the barometric column of water within the tube, viz, sufficient for an altitude of thirty-three feet, more or less, and

a vacuum will be formed in the tube in its remaining elevated position.

It will be observed that the only channel through which the contained water of the race D can rush to fill the vacuum in the upper portion of the tubes *a a'* is by way of the pipe *e*, feeding the turbine water-wheels, which are thus obviously operated before the water can pass them and supply the vacuum through the vent-tubes *e'*, which empty from the wheels E directly into a tube, *a* or *a'*; but as fast as water enters the vacuum portion of a tube *a* like amount escapes through the vent B. Thus it will appear that so long as the valves *a''* are kept air-tight and the vents B continued to be submerged in water, the vacuum in the tube *a* or *a'* will never be destroyed or overcome, and as this vacuum will exist along the upper or elevated portion of the tubes or sections *a a'*, any desired number of turbine water-wheels E may be here distributed, each acting independently of the other, yet all operated by the same vacuum-space.

By my arrangement of the tubes or chambers *a a'* in quincunx order, as shown in Fig. 2, it will be seen that I have provided an unbroken vacuum-chamber along the entire line, for at the point where the water in a tube, *a*, would stand, (and where, consequently, the vacuum could not be utilized,) will begin the elevated or vacuum chamber of a tube, *a'*, which in its turn will afford a vacuum-space until the barometric column of water is again reached, at which point the next consecutive tube *a* will have been attained, where a fresh vacuum-space is found, and so on along the entire route.

What I claim as my invention is—

1. As a means of automatically obtaining a continuous vacuum, a tube or chamber, great-

er or less in its length, according to the angle of its inclination, having an altitude of sixty-six feet, more or less, from one extremity to the other, and open at its bottom or lower end, said tube or chamber inclosed in, and completely submerged by, the contained water or fluid of an external race, trough, or tube, whereby a barometric column of fluid and consequent vacuum may be maintained, notwithstanding an introduction of fluid within the vacuum-space above said barometric column, substantially as shown and described.

2. In combination with a tube, *a* or *a'*, and race or tube D with its contained water, constructed and operating substantially as specified, the turbine water-wheel E, having its feed-pipe tightly closed by a spring-valve, and its exit or vent connected with, and opening into, the vacuum-space of said tube *a* or *a'*, substantially as and for the purpose shown.

3. In combination with the feed-pipe *e* of the turbine water-wheel E, the gate or valve *f*, spring *f'*, and crank-lever F, substantially as shown, for the purpose of the automatic opening and closing of the feed-pipe *e*.

4. In combination with the race or external tube D, the tubes *a* and *a'* placed relatively to each other in quincunx order, substantially as and for the purpose shown.

5. In combination with the turbine wheel E and the arm or lever F of its gate or valve *f*, a cam of the car or vehicle, substantially as and for the purpose shown.

In testimony that I claim the foregoing I have hereunto set my hand this 8th day of April, 1875.

JOHN W. D. ECKLES.

Witnesses:

LEVERETT L. LEGGETT,
WM. L. BRAMHALL.