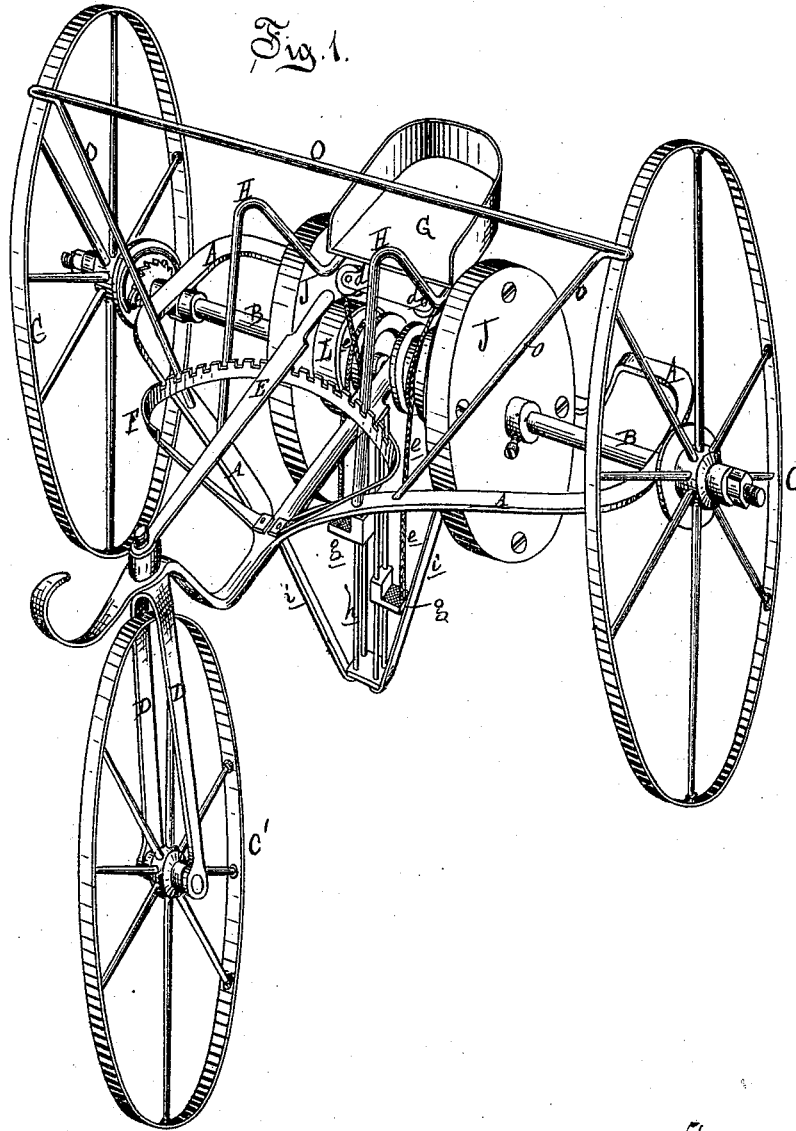


F. S. SEAGRAVE.
Velocipede.

No. 169,302.

Patented Oct. 26, 1875.



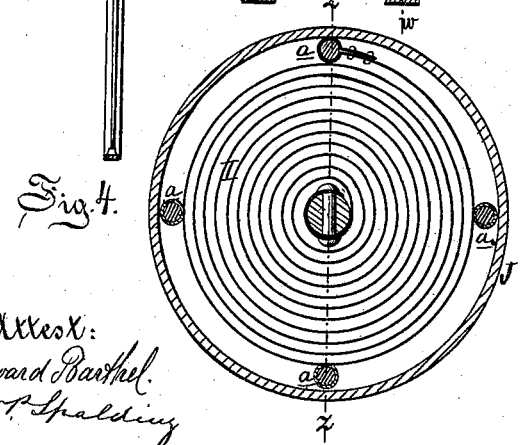
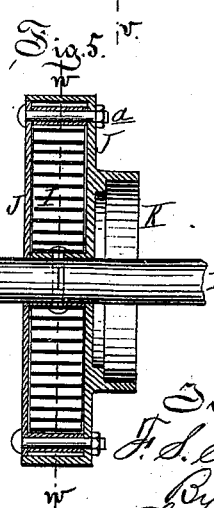
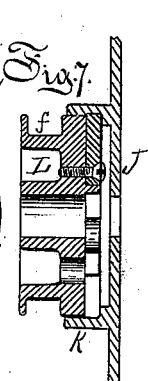
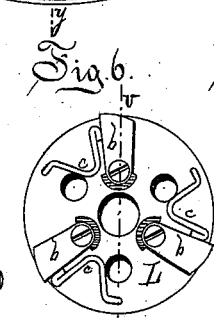
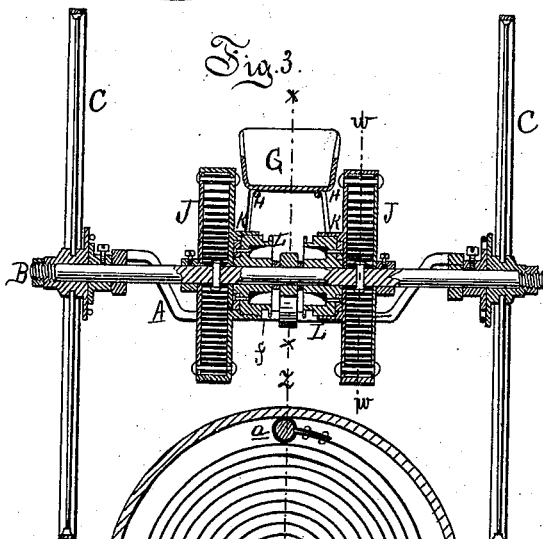
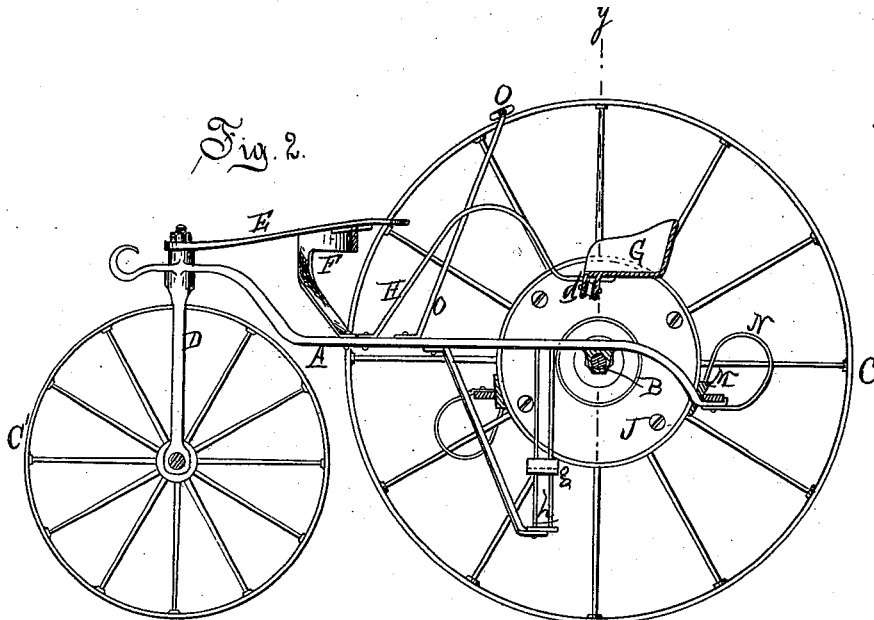
Attest:
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UNITED STATES PATENT OFFICE.

FREDERIC S. SEAGRAVE, OF DETROIT, MICHIGAN.

IMPROVEMENT IN VELOCIPEDES.

Specification forming part of Letters Patent No. **169,302**, dated October 26, 1875; application filed April 27, 1875.

To all whom it may concern:

Be it known that I, FREDERIC S. SEAGRAVE, of Detroit, in the county of Wayne and State of Michigan, have invented an Improvement in Velocipedes, of which the following is a specification:

My invention has for its object to so combine a pair of pedals, two or more friction-pawls, and two or more friction-wedges, with several incased coiled springs, as to not only make available the weight of the human body, but also the recoil of the springs, to the propulsion of velocipedes and other wheeled vehicles on land, and light vessels floating in a fluid.

Figure 1, Sheet 1, is perspective view of a velocipede having my improvement applied thereto. Fig. 2, Sheet 2, is a longitudinal vertical section at $x x$ in Fig. 3, which is a transverse section at $y y$ in Fig. 2. Fig. 4 is an enlarged vertical section through a spring and case, taken on the line $w w$. Fig. 5 is a cross-section of the same at $z z$. Fig. 6 is an elevation of the inner face of a friction-pawl plate. Fig. 7 is a cross-section of the same at $v v$, showing also a part of the spring-case, in which it is sleeved, and with which it engages.

In the drawing, A represents an iron frame, triangular in its general outline, across and under which an axle, B, is journaled through boxes, carrying a driving-wheel, C, sleeved upon each arm. There is a spring-pawl on the inner end of each hub, which engages with a ratchet on the axle, causing the wheels to rotate in a forward direction, but which leaves them free to turn backward independently, or to remain stationary, as when turning a short curve. C' is the front or guiding wheel, journaled in a forked pedestal, D, whose shank passes up through a forward prolongation of the frame. Its top end is squared to receive a tiller, E, which extends back over and is locked in a notched segment, F, erected on the fore part of the frame. G is a seat, mounted on two arched braces, H H, extending from the front to the rear end of the frame. The seat-braces are arched up above the plane of the seat in front thereof. At each side of the seat the inner end of a strong coiled spring,

I, is secured to the axle. The spring is inclosed in a cylindrical case, J, to whose rim its outer end is secured, or rather to one of the transverse bolts a near the rim, which holds the heads or sides together. The inner head is provided with a circular flange, K, which receives the end of a friction-drum, L, sleeved on the axle. The inner face or end of this drum has several cam-dogs, b , pivoted to it near the center, each thrown forward by a spring, c , behind it, so as to protrude its obliquely-curved end beyond the periphery. When the drum is inserted in the flange K the drum may turn freely backward on the axle, but if turned forward these dogs catch against the flange, and carry the spring-case with it, coiling or winding up the spring from the outer end. Under the front edge of the seat there are two pulleys, $d d$, in line, over which runs a cord, e , one end of which is taken down under, around, and over a groove, f , in the drum, thence down to a pedal, g , sliding in guides h pendant from the center bar in the main frame, and supported at their lower ends by diagonal braces $i i$. The cords at the back part of each drum are secured by staples or otherwise, to prevent slipping thereon. The back girt of the frame A is depressed below the plane of the axle, and passes in close proximity to the rims of the spring-cases, each of which has a friction-wedge, M, inserted between it and the frame-girt, which wedge is so suspended by a C-spring, N, as to allow the spring-case to rotate forward, as in propelling the vehicle, but will wedge it fast against any tendency to turn back from the recoil of the spring. O is a spring-bar, whose ends are secured to the sides of the main frame, but whose main part extends across the rims of the driving-wheels, but not in contact therewith, unless pulled back by the operator, who grasps the bar in his hands and leans back in the seat when he wishes to stop the vehicle.

The springs are wound up by alternately depressing the pedals, and, as soon as they are under tension, they will, through the mechanism described, move the axle and wheels forward. The motion of the vehicle can be kept up by a moderate movement of the pedals;

but where great speed is to be made the springs are wound up to their greatest tension by full and rapid strokes or reciprocation of the pedals; or power may be stored up in the springs, to enable the vehicle to run up an incline.

When exerting his full power the rider stands upright to work the pedals, steadying himself by grasping the arches of the seat-braces, and may assist his weight by pulling down with each hand alternately to depress the treadle.

The mechanism described may also be applied to the propulsion of various kinds of machinery where high speed may be required for limited periods of time, and to the propulsion

of vessels of small size and light weight in water or other fluids.

What I claim as my invention is—

The combination of the pedals, the cord, the frictional clutches, drums, and the friction-wedges, with the spring-cases and their coiled springs, for rotating the axle or wheel shaft, all substantially as and for the purposes set forth.

FREDERIC S. SEAGRAVE.

Witnesses:

H. F. EEBERTS,

H. S. SPRAGUE.