(No Model.)

S. W. MORGAN.

VELOCIPEDE.

No. 337,975. Patented Mar. 16, 1886.

Fig. 1

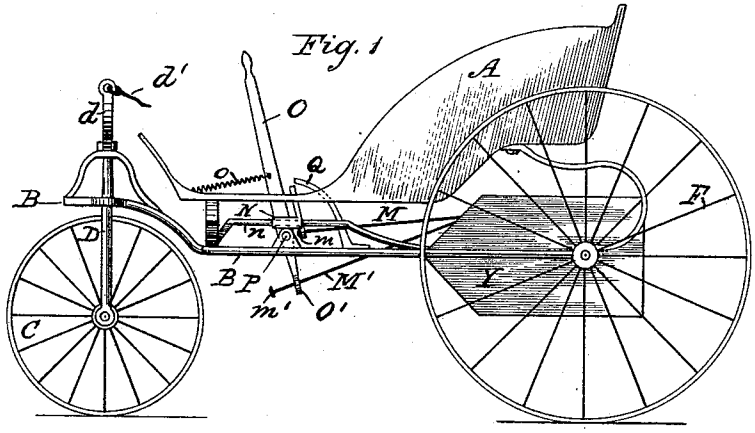


Fig. 3.

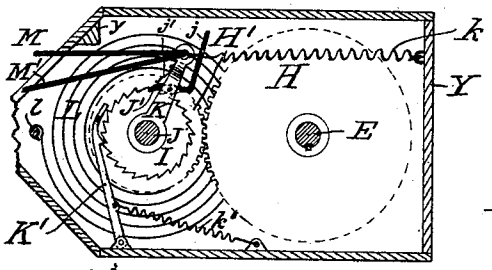


Fig. 4.

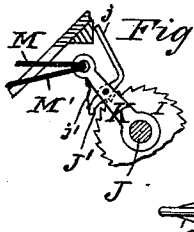


Fig. 2.

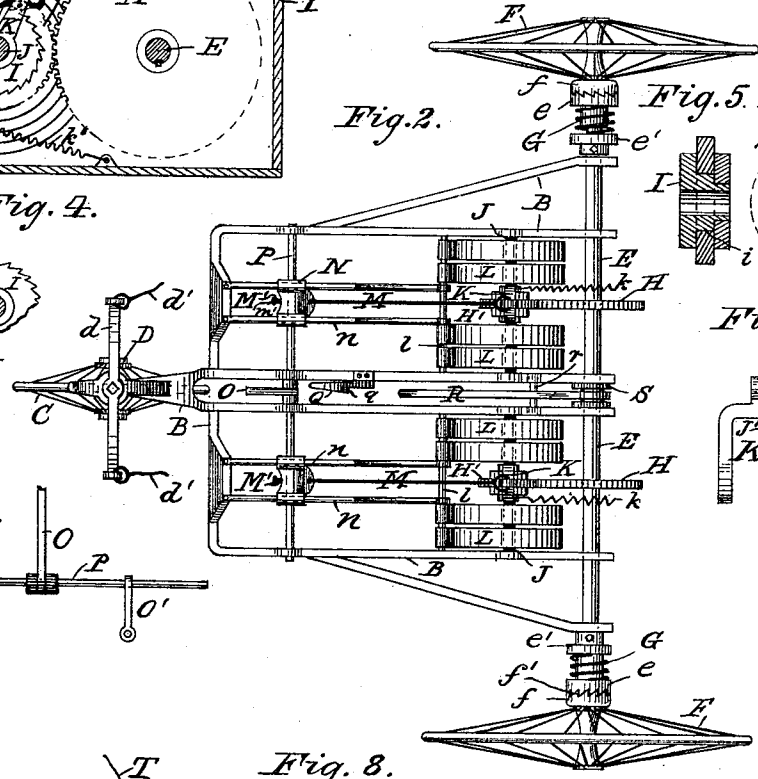


Fig. 5. Fig. 6.

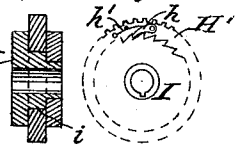


Fig 7.

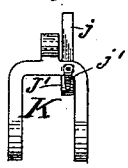
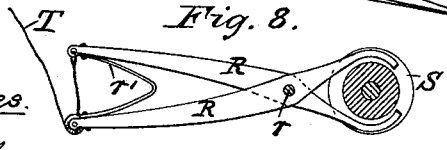


Fig. 9.

Fig. 8.



Witnesses.
W. B. Hill.
A. M. Johnson.

Inventor.
S. W. Morgan
per. J. R. Thurston
Attorney

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

SCHUYLER W. MORGAN, OF EAST CONCORD, NEW HAMPSHIRE.

VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 337,975, dated March 16, 1886.

Application filed August 4, 1885. Serial No. 173,488. (No model.)

To all whom it may concern:

Be it known that I, SCHUYLER W. MORGAN, a citizen of the United States, residing at East Concord, in the county of Merrimack and State of New Hampshire, have invented certain new and useful Improvements in Power Road-Carriages, of which the following is a specification.

My invention relates to road-carriages which are propelled by the feet or hands of the occupant or rider.

The object of my invention is to provide in a road-carriage suitable mechanism whereby power may be generated or stored up before starting by the usual motion of the feet or hands; and, further, to maintain said power by continuing the foot or hand motion when the said carriage is in motion, and, finally, to provide means whereby said carriage when going around curves or turning corners may be propelled with less expenditure of power.

My invention consists of a series of coil-springs, mounted on counter-shafts located a little forward of the driving-axle of a road-carriage, adapted to be wound up by the feet or hands of the occupant and to furnish the motive power by means of gearing connecting with the driving-axle.

My invention further consists of the combination, with said driving-axle, of a suitable clutch, which may be splined thereon in such manner as that the driving-wheels, which are mounted loosely on said axle, when turning corners or curves may either of them revolve independent of the said axle—*i. e.*, the wheel describing the largest circle, being the one propelled by the driving-axle, while that wheel describing the smallest circle will necessarily revolve much slower than the other, and consequently must slip on the said axle.

In the accompanying drawings, forming part of this specification, Figure 1 represents a side elevation of my improved road-carriage, Fig. 2 being a plan view having the carriage-body removed; also, the case which incloses the power mechanism. Fig. 3 is an enlarged elevation of one pair of gears which connect the counter-shafts and driving-axle, one ratchet-wheel with its winding-lever, spring-pawl, and a section of the connecting rods in position, and showing the case by which the mechanism is inclosed and a counter-shaft and the driving-axle in section. Fig. 4 shows a section of a counter-shaft, a ratchet-wheel with its winding-lever, connecting-rods, and spring-pawl, as when the latter is in contact with a stop on the casing and disengaged from the teeth of the ratchet-wheel. Figs. 5 and 6 are respectively a vertical section and side elevation of one pair of ratchet-wheels and their spur-gear. Fig. 7 is a detailed front view of one of the winding-levers. Fig. 8 is a side elevation of my improved brake as when in position ready for application to a pulley on the driving-axle, and Fig. 9 is a front view of the rod carrying the levers by which the spring-pawls are thrown out of the ratchet-wheels and the full force of the springs allowed to act upon the gearing.

The carriage-body A is mounted upon the C-springs behind, and an ordinary elliptic spring in front, which are all secured to certain portions of a frame, B. A guide-wheel, C, is mounted in a fork, D, journaled in a central projection of the frame in front, and controlled by a transverse arm, *d*, from either end of which a cord, *d'*, passes to the hand or in convenient reach of the hands of the rider. The driving-axle E is provided with a journal at either end, upon which the driving-wheels may revolve. These driving-wheels F may be of any approved construction, their hubs being provided upon their inner end with a flange, *f*, in the flat surface of which are formed ratchet-teeth *f'*. A collar, *e*, is splined to the axle at the inner end of either journal, so that it may be free to move longitudinally, but still revolve with said axle. Collars *e'* are also secured to said axle by set-screws or otherwise just outside of the frame B, and between these and the clutches or collars *e* are mounted spiral springs G, which cause the latter to rotate the driving-wheels when power is applied to the axle; or when the carriage is turning corners and the outside wheel is inclined to revolve faster than the axle it is permitted such action by reason of the collar *e* slipping the teeth on the hub and compressing the spring G. Two spur-gears, H, are mounted, as shown in Fig. 2, on the driving-axle E, meshing with

smaller spur-gears H′, which are mounted loose on the hubs *i* of ratchet-wheels I, which are each keyed to a counter-shaft, J. There are two of these counter-shafts J, mounted a little forward of the driving axle in the frame B, and on a line with each other end to end, so that the action of one is independent of the other.

The ratchet-wheels I are constructed as shown in Figs. 5 and 6, in order that the gears H′ may be mounted between them and revolve either with or independent of them, the gears H′ having upon one side a pawl, *h*, which engages the teeth of the ratchet-wheel upon the same side of said gears, said pawl being held in contact with said teeth by means of a suitable spring, *h*′. A forked lever, K, straddles the gears H′ and ratchet-wheels I, and is mounted loosely upon either of the counter-shafts J, each of said levers being provided with a pawl, J′, having an arm, *j*, (the purpose of which will be hereinafter described,) and acted upon by a suitable spring, *j*′. These pawls J′ engage the teeth of the ratchet-wheel opposite to that in which the pawl *h* of the gears H′ operate.

Somewhere on either of the counter shafts J or at either side of the levers K are mounted suitable coil-springs, L, the outer or free end of said springs being secured to a transverse bar, *l*, forming part of or attached to the frame B. In order to wind these springs L, rods M, connecting the levers K with suitable foot-plates, N, are provided, said foot-plates having a reciprocal motion upon the slideways *n*, secured to the frame B. The foot-plates N may be moved alternately or both at the same time; or one may be operated without the other, if desired, and they are returned after being moved forward by means of the spiral spring *k*, connecting the levers K with the rear wall of the casing Y, inclosing the driving mechanism.

Pawls K′ engage the teeth of the ratchets I, in which the pawls J′ operate, as seen in Fig. 3, and are held to their work by aid of the spiral springs *k*′. Thus when the ratchet-wheels I are rotated by the pawls J′ the pawls K′ slip the teeth of said ratchets; but when said pawls J′ are returning to the position shown in Fig. 3 the pawls K′ hold whatever has been wound.

When the springs have been wound sufficiently, and it is desired to apply power to the driving-wheels, so as to start the carriage, the occupant has simply to pull the lever O, which is secured centrally in the frame B to a transverse rod, P. Projecting downward from said rod, directly under the slideways *n*, are levers O′, through the free ends of which the rods M′, connecting said levers O′ with the levers K, are passed. The forward ends of the rods M M′ are provided with a head, *m m*′, respectively, by which they are drawn forward, and when the mechanism is being wound these rods M′ slide back and forth in the levers O′; but when the lever O is pulled back the levers O′ are moved forward, and with them the rods M′ and levers K, the rods M at the same time being permitted to slide forward in the foot-plates N one inch (more or less) further than they would travel if limited to the stroke of said foot-plates, thus bringing the winding-levers K to the position shown in Fig. 4, which throws both pawls J′ and K′ out of the ratchet-wheels I, and applies the full power of the springs on both counter-shafts simultaneously to the driving-wheels. The pawl J′ is thrown out of gear by contact of its arm *j* with a suitable stop, *y*, secured for this purpose to the forward part of the casing Y, as seen in Fig. 4, and the pawl K′ by contact with the lever K. The lever O is slipped back of the notch *q*, formed upon one side of the stop Q, which is secured for this purpose to the frame B, and is so retained as long as power is required to be applied to the driving-wheels, but when it is let off said stop, a spring, *o*, instantly returns it to position shown in Fig. 1.

A brake is applied to the driving axle, consisting of a pair of tongs, R, closing over a grooved pulley, S, which is mounted on said axle, said tongs R being adapted to open and close in a vertical direction, and secured to the carriage-frame B by means of their fulcrum-pin *r*, which projects far enough on either side of said tongs to enter bearings in said frame, as seen in Fig. 2. A V-shaped spring, *r*′, is secured to the long arms of said tongs, which presses them apart, and consequently holds the jaws away from contact with the pulley S; but when it is desired to apply the brake said jaws may be closed upon said pulley by means of a cord, T, which is secured to the end of the top arm of the tongs, and passes down around a sheave upon the end of the lower arm, and upward to a point in convenient reach of the hand of the rider.

I am aware that brakes consisting of two levers operated by a cord to seize the object to be stopped have heretofore been used, and I do not claim such a device broadly.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a velocipede, the combination, with the frame B and its attachments, and the driving-axle E, of the spur-gears H, the counter-shafts J, the double ratchet-wheels I, and spur-gears H′, mounted loosely between the same, and spring-pawls *h*, attached thereon, the forked levers K, mounted on said counter-shafts J, and spring-pawls K′ and spiral springs *k*, attached thereto, the pawls J′, having arms *j* and suitable springs, *j*′, the coil-springs L, mounted as shown, the rods M M′, having at one end, respectively, the heads *m m*′, the foot-plates N, mounted on ways *n*, the levers O O′, springs *o*, and casing Y, all constructed, arranged, and operating substantially in the manner and for the purpose set forth.

2. In a road-carriage, the combination, with the main axle and springs for actuating the same, of the mechanism for winding up said springs by hand and foot power, consisting

of the ratchet and pawl devices, the hand-lever O, the pedals N, and rods extending from said pedals and lever to said ratchet and pawl devices to actuate the same, the rods having an engagement with the lever and pedals in one direction and free to move relatively thereto in the other direction, substantially as set forth.

3. In a road-carriage having axle-actuating springs, the combination, with the springs, of a shaft and ratchet-wheel for winding them up, a pawl for turning said wheel, a hand-lever and connections for oscillating the pawl, and a stop, *y*, the pawl having a projecting arm for engaging the stop to throw out the pawl when sufficiently moved by the hand-lever, substantially as set forth.

4. In a road-carriage, the combination, with the axle, of the grooved wheel S, keyed thereon, the brake-levers R R, arranged transversely to the axle and pivoted together so as to form arms of different lengths, the shorter of said arms being provided with concave grasping-jaws partially surrounding said wheel, the spring *r'*, and the operating-cord T, attached to one of the said longer arms and passing around a pulley on the other arm, and thence to within reach of the driver, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

SCHUYLER W. MORGAN.

Witnesses:
J. B. THURSTON,
L. D. STEVENS.