E. WHITEHEAD.

VELOCIPEDES.

No. 194,980. Patented Sept. 11, 1877.

FIG. 1.

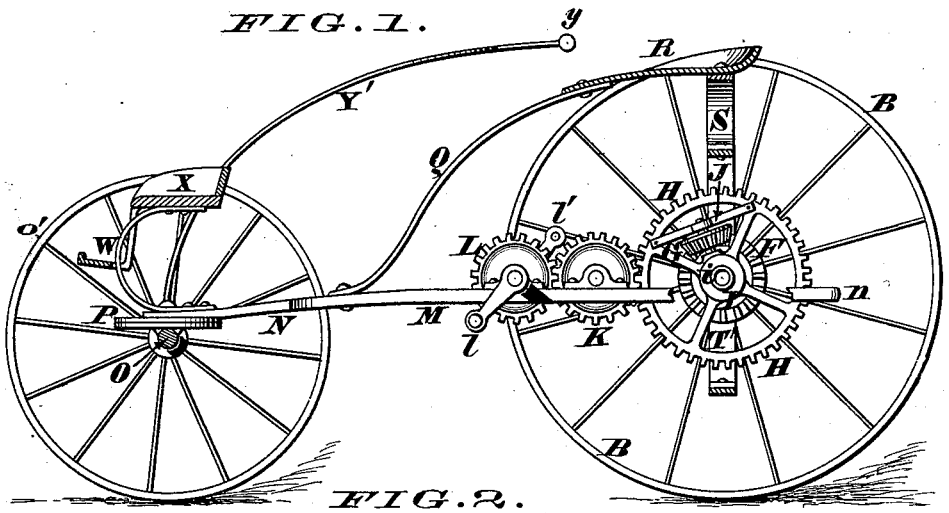


FIG. 2.

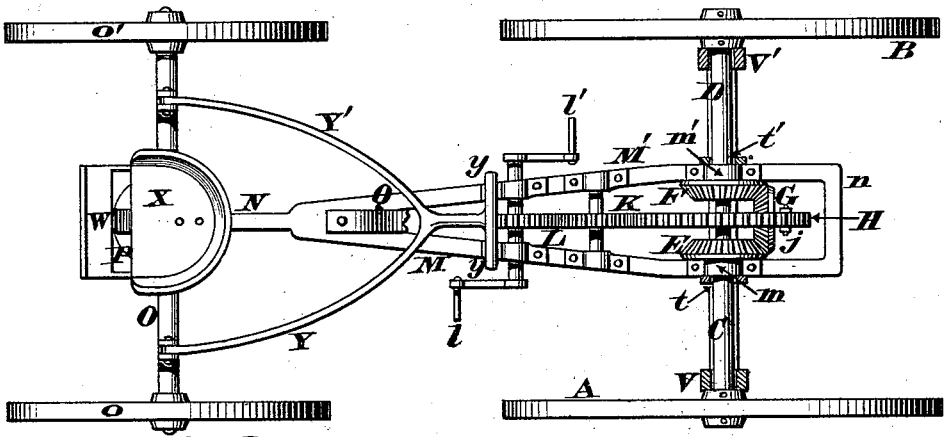


FIG. 3.

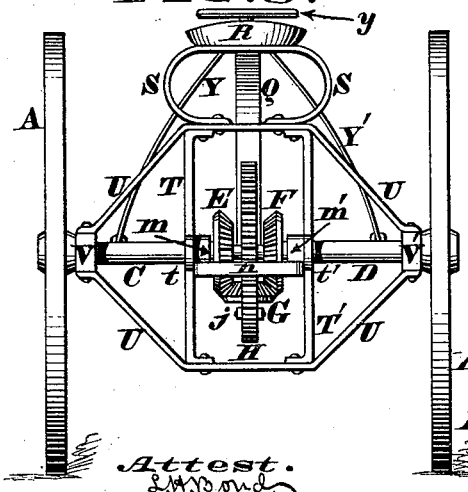
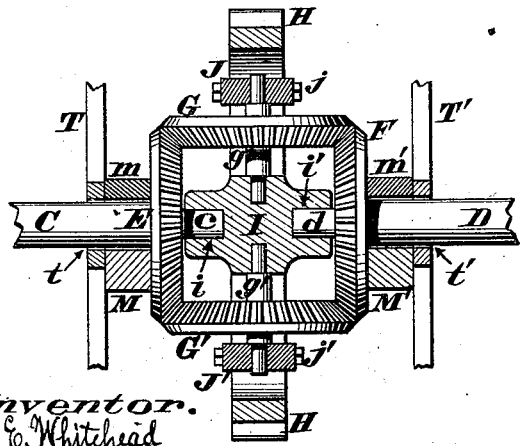


FIG. 4.



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UNITED STATES PATENT OFFICE.

EDWARD WHITEHEAD, OF CINCINNATI, OHIO.

IMPROVEMENT IN VELOCIPEDES.

Specification forming part of Letters Patent No. **194,980**, dated September 11, 1877; application filed August 9, 1877.

To all whom it may concern:

Be it known that I, EDWARD WHITEHEAD, of Cincinnati, Hamilton county, Ohio, have invented certain new and useful Improvements in Velocipedes, of which the following is a specification:

This invention relates to that class of velocipedes having two independent driving-wheels in the rear, operated by the rider's feet through the instrumentality of suitable cranks and a series of gear-wheels; and the object of my invention is to render such vehicles capable of being diverted or turned either to the right or left with the greatest facility, and without interfering with the proper action of the foot-cranks.

To accomplish these results, I secure to the inner end of one of the driving-axles a bevel-wheel, which gears with another bevel-wheel, the latter being applied to a shaft that occupies a radial position with reference to the master-wheel of the vehicle. Said master-wheel is operated from the foot-cranks by means of one or more gear-wheels, or with pulleys and belts, if preferred. The inner end of the other driving-axle is also furnished with a bevel-wheel that gears with the bevel-wheel applied to the above-described radial shaft of the master-wheel of the velocipede. This master-wheel is located between and revolves freely on the inner ends of the two driving-axles. Now, when the vehicle describes a curve, the aforesaid construction allows the outer driving-wheel to rotate at a higher speed than the inner one, and without in the least affecting the movements of the foot-pedals or other actuating devices.

In the annexed drawings, Figure 1 is a longitudinal section of my improved velocipede. Fig. 2 is a plan of the same, the driver's seat and a portion of its supporting-frame being removed. Fig. 3 is a rear elevation of the vehicle; and Fig. 4 is a vertical section of a modified form of the master-wheel, taken in the plane of the driving-axles of the vehicle.

A B represent the two independent rear or driving wheels of the velocipede, said wheels being rigidly secured to their respective axles C D, whose inner ends terminate with stud-shafts *c d*, as more clearly seen in Fig. 4. Keyed to driving-axle C, and near the inner end thereof, is a bevel-wheel, E, of any suitable size. F is a precisely similar bevel-wheel, secured near the inner end of the other driving-axle D. These two wheels E F mesh with a bevel-wheel, G, whose shaft *g* occupies, preferably, a radial position with reference to the master-wheel H. The inner end of this radial shaft *g* is stepped in the hub I of wheel H, while the outer end of said shaft is journaled in a bar, J, which latter may be secured to said master-wheel with bolts *j* or otherwise. This bar may, however, be omitted, and the outer end of the radial shaft can be journaled in a box bolted to a web or lug cast with wheel H. Furthermore, the hub I is furnished with two axial sockets, *i i'*, to receive the stud-shafts *c d*, by which means said shafts are caused to serve as the journal-bearings for master-wheel H. Wheel H gears with another one, K, which intermediate wheel K engages with the one L, to which latter the driving-cranks or foot-pedals *l l'* are applied.

The shafts of wheels K and L are journaled in the forwardly-converging bars M M' that connect with perch N. *m* is a cross-bar, that unites the rear ends of members M M'. This perch M M' N couples the driving-axles C D with the front axle O, upon which latter revolve the guiding-wheels *o o'*, said axle O being united to the perch with any ordinary king-bolt.

P is the fifth-wheel of the velocipede. Q is a spring-bar, attached to perch N, for the support of driver's seat R, the rear end of said seat being mounted upon an upright frame, T T'. S is a spring, interposed between said seat and frame. *t t'* are perforations in the frame, to admit the inner ends of axles C D. (See Fig. 4.) U are inclined braces, connecting said frame with the outer journal-boxes V V' of the driving-axles. W is a spring-bar, that supports the front seat X of the vehicle. Attached to axle O are curved bars Y Y', united at their rear ends to a guiding-handle, *y*, which handle is conveniently located with reference to the occupant of seat R. *m m'* are the inner journal-boxes of driving-axles C D. (See Figs. 2 and 3.)

The occupant of seat R operates the cranks or pedals *l l'* with his feet in the usual manner, and guides the velocipede with handle

y, the front wheels *o o'* being kept directly in line with the drivers A B when it is desired to have the vehicle proceed in a straight course. During this directly forward progress, master-wheel H imparts uniform rotation to both driving-axles C D through the medium of the bevel-gear G of said wheel H. This bevel-gear G now drives both of the bevel-wheels E F and their attachments, but does not revolve upon its own shaft *g*, being simply carried around with master-wheel H.

In describing a curve, said bevel-gear G operates in an entirely different manner, and in order to illustrate this opposite action of said bevel-gear, I will suppose the handle *y* has been shifted so as to turn the velocipede to the left. It is evident that as the vehicle turns in this direction the driving-wheel B must rotate at a higher speed than the wheel A, because said wheel B is describing the curve of the larger radius. Now, the only effect of this increased rotation of driver B is to cause bevel-gear G to revolve on its radial shaft *g*, or with said shaft, and without interfering with the free action of pedals *l l'*, which continue to operate the other driver, A, through the instrumentality of actuating devices E, G, H, K, and L. If the velocipede should be diverted to the right, the opposite result takes place—that is to say, driver A now rotates rapidly, and revolves the bevel-gear G in its bearings, while the other driver, B, is being operated by the foot-cranks *l l'*, in the usual manner. As soon as the velocipede is again confined to a straight course, bevel-gear G ceases to rotate in its bearings, and consequently both drivers A B are now driven at an uniform speed from the pedals *l l'*.

If preferred, master-wheel H may be furnished with an additional bevel-gear, G', mounted upon a shaft, *g'*, as seen in Fig. 4; and in some cases three or more of such gears may be applied to a single master-wheel.

I claim as my invention—

1. A master-wheel, H, whose hub I is provided with sockets *i i'*, within which sockets are journaled the driving-axles C *c* D *d*, whose bevel-wheels E F are operated by a bevel-gear, G, applied to said master-wheel, substantially as herein described.

2. An improved velocipede, consisting of driving-wheels A B, axles C *c* D *d*, bevel-wheels E F, and one or more bevel-gears, G, which bevel-gears are applied to the master-wheel H I *i i'*, substantially as herein described.

3. In combination with master-wheel H I *i i'*, having the bevel-gear G applied thereto, the wheels K L and foot-pedals *l l'*, substantially as herein described.

In testimony of which invention I hereunto set my hand.

EDWARD WHITEHEAD.

Witnesses:
JAMES H. LAYMAN,
L. H. BOND.