No. 634,340. Patented Oct. 3, 1899.

E. HARNETT.

SPRING CYCLE.

(Application filed June 19, 1899.)

(No Model.) 2 Sheets—Sheet 1.

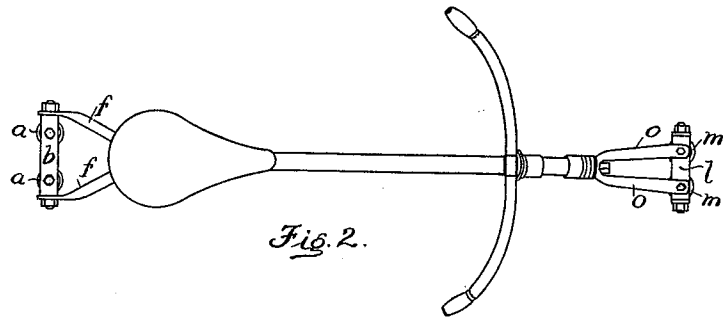


Fig. 2.

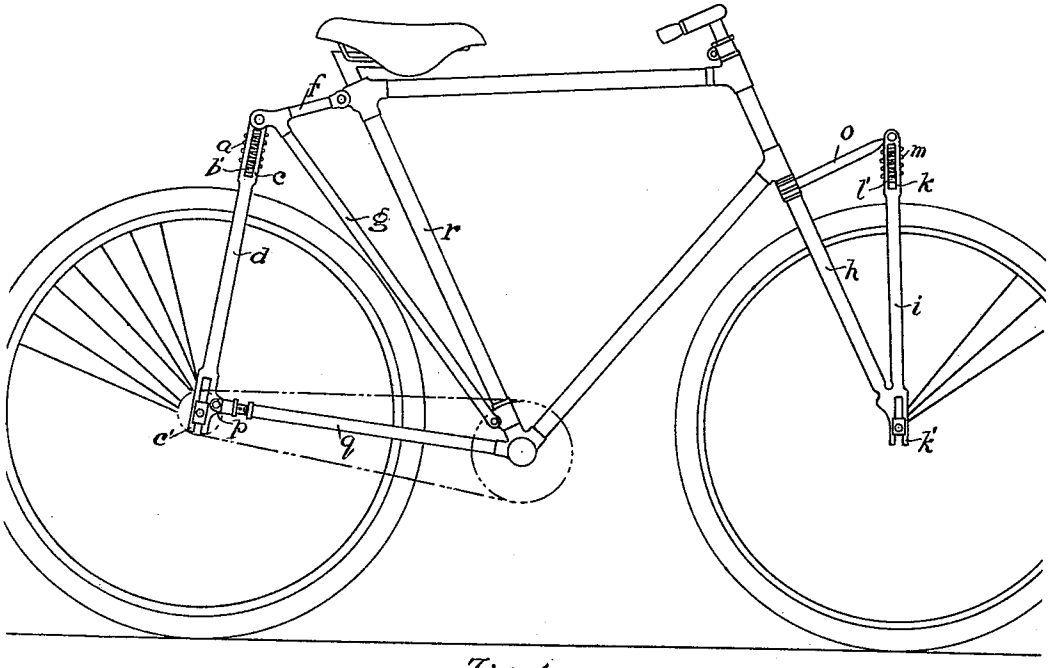


Fig. 1.

Witnesses:—
Clarence A. Bateman
Percy C. Bowen.

Inventor:—
Edward Harnett
by Wells Brien & Foster
Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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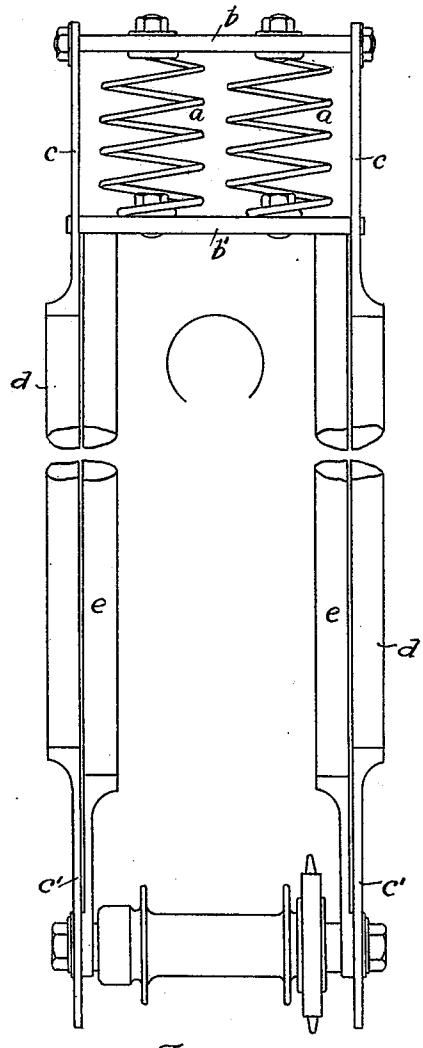


Fig. 3.

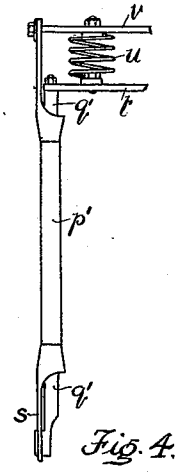


Fig. 4.

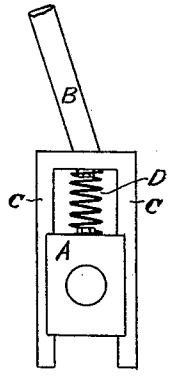


Fig. 5.

Witnesses:—
Clarence A. Bateman
Percy C. Bowen

Inventor:—
Edward Harnett,
by Wilkinson & Fisher,
Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EDWARD HARNETT, OF LONDON, ENGLAND.

SPRING-CYCLE.

SPECIFICATION forming part of Letters Patent No. 634,340, dated October 3, 1899.

Application filed June 19, 1899. Serial No. 721,104. (No model.)

To all whom it may concern:

Be it known that I, EDWARD HARNETT, a subject of the Queen of Great Britain and Ireland, residing at St. Peter's Cottage, Usk road, Battersea, London, England, have invented Improvements in the Application of Springs to Cycles, (for which I have made application for Letters Patent in Great Britain, No. 11,663, bearing date June 5, 1899,) of which the following is a specification.

My invention relates to and consists of improvements in the application of springs to cycles, its object being to eliminate or greatly reduce the vibration and jolting ordinarily experienced.

In order that the nature of my invention may be understood, I will describe the same in the first place as applied to the rear-driving safety-bicycle.

I suspend the driving-wheel in an independent substantially vertical fork, which fork is connected at the top by springs to a cross-piece forming the top of an outer fork, which latter constitutes part of the framework of the machine. The axle of the wheel passes through guides in the outer fork. Guides are also provided near the top of the outer fork for the upper portion of the inner fork to slide in. In the case of the front wheel in order to keep the independent fork in a substantially vertical position I attach the outer fork to the bottom of the ordinary front fork, the remainder of the construction being the same as for the driving-wheel.

In order that my said invention may be more clearly understood, I will now proceed to describe the same with reference to the drawings accompanying this specification, in which—

Figure 1 shows an elevation of a safety-bicycle constructed according to this invention. Fig. 2 shows a plan of top portion of same; Fig. 3, a part elevation of back of machine, showing the arrangements of the springs and guides. Fig. 4 shows a modified form of construction hereinafter referred to. Fig. 5 shows my invention as applied to a tricycle.

The same letters of reference are employed to denote the same parts in all the views.

a shows spiral springs fixed to the cross-pieces *b b'*. The cross-piece *b'* slides in guides *c*, fixed to the upper portion of rods *d*. At the lower ends of these rods are other guides *c'*, which slide over the axle of the driving-wheel.

e shows the fork carrying the driving-wheel, the top of such fork being formed by the cross-piece *b'*.

f shows short stays for connecting the cross-piece *b* with the top of the frame near the seat-pillar, and *g* are other stays for connecting the said cross-piece with the seat-pillar tube *r*, near the bottom bracket. The guides *c'* are connected at *p* to the chain-stays *q*.

To the lower end of the front fork *h* are connected two vertical rods *i*, having guides *k k'*. The upper ends of the guides *k* are connected together by a cross-piece *l*.

m are spiral springs connecting the cross-piece *l* with the cross-piece *l'*, which latter slides in the guide *k*. The cross-piece *l'* forms the top of a fork similar to the fork *e*, carrying the front wheel. The axle of this wheel slides in the guides *k'*.

o are two stays connecting the cross-piece *l* to the top of the front fork *h*.

With reference to Fig. 4, which shows a modified form of construction by which the top guides may be dispensed with, the outer fork consists of a tube *p'* and the inner fork *q'* slides within it.

s is the lower guide, in which the axle slides.

t is the cross-piece at the top of the independent fork, and *u* is one of the springs.

V is the upper cross-piece.

In applying my invention to the driving-axle of a rear-driving tricycle I prefer to provide a fork at the bottom of each of the back-stays which extend to the top of the frame near the seat-pillar. I further provide two blocks, through which the driving-axle passes. The two forks are made to slide over the two blocks, preferably in grooves, springs being interposed between the horizontal portions of the forks and the tops of the blocks. I may find it desirable to pivot the chain-stays.

Fig. 5 shows a method of applying my invention to a tricycle. In this figure, A shows a block through which the axle passes. B is the backstay, extending to the top of the frame near the seat-pillar. This stay is provided with a fork C, which slides, preferably in grooves, in block A. A spring D is interposed between the horizontal portion of the

fork C and the top of the block A. A similar sliding arrangement is connected to the other backstay, so that the axle is carried by the two blocks A.

The application of my invention to the front wheel of a rear-driving tricycle is similar to its application to the front wheel of the rear-driving safety-bicycle.

Although I have described and shown spiral springs as employed in carrying out my invention, I may employ any suitable spring varying in form, construction, or material. This may be a pneumatic chamber.

Although I have described and shown my invention as applied to rear-driving cycles, it may with advantage be applied to cycles of other descriptions.

What I claim, and desire to secure by Letters Patent, is—

1. A bicycle having a rear fork composed of two forked members one of which is rigidly secured to the axle of the rear wheel and the other member located just outside of said first member and capable of longitudinal movement relative to the said first member, cross-pieces connecting the upper ends of the respective members, springs inserted between said cross-pieces, slotted guides at the upper and lower ends of said movable member with the cross-piece of said fixed member and the axle of the rear wheel working in said guides, and stays connecting the upper end of said movable member with the center stay of the bicycle-frame, substantially as described.

2. A bicycle having a rear fork composed of two forked members one of which is rigidly secured to the axle of the rear wheel and the other member located just outside of said first member and capable of longitudinal movement relative to the said first member, cross-pieces connecting the upper ends of the respective members, springs inserted between said cross-pieces, slotted guides at the upper and lower ends of said movable member with the cross-piece of said fixed member and the axle of the rear wheel working in said guides, stays connecting the upper ends of said movable member with the bicycle-frame, and a stay extending from the aforesaid stays to the lower end of the center frame-stay, substantially as described.

3. A bicycle having a vertical fork secured at its lower end to the lower end of the front steering-fork of the bicycle and provided at that end with slotted guides which engage the axle of the front wheel and also provided with slotted guides at its upper end, a fork fixed at its lower end to the axle of the front wheel and extending upward alongside said vertical fork, cross-pieces extending across the upper ends of said vertical forks, the cross-piece of the fixed fork engaging the slotted guides at the upper end of the moving fork, springs inserted between said cross-pieces, and stays connecting the upper end of the movable vertical fork to the front steering-fork of the bicycle-frame, substantially as described.

EDWARD HARNETT.

Witnesses:
A. E. VIDAL,
J. M. LANDON.