(No Model.)

2 Sheets—Sheet 1.

P. EVERITT, Dec'd.

H. M. WOOLF, Ancillary Executor.

VELOCIPEDE.

No. 530,169. Patented Dec. 4, 1894.

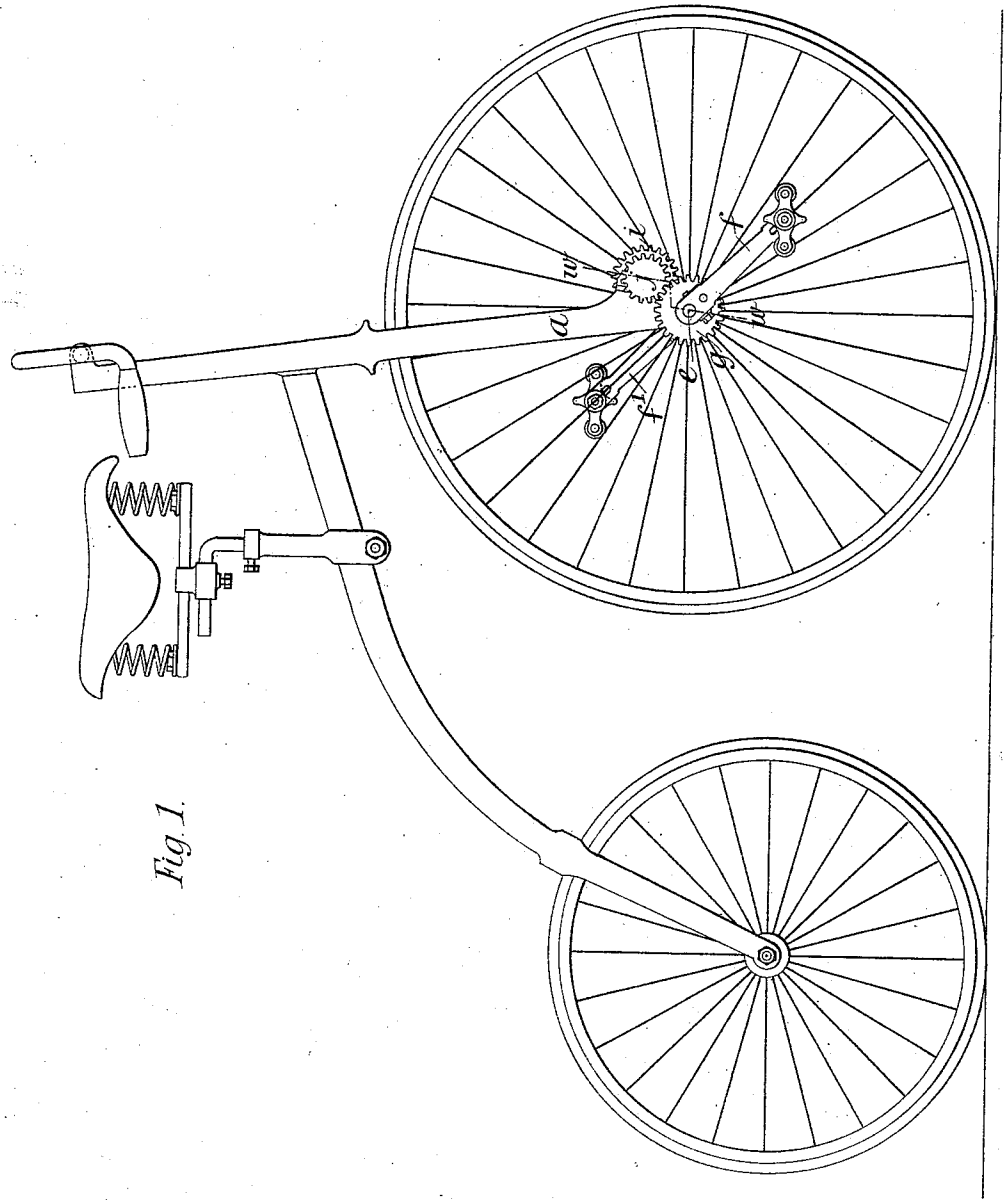

Fig. 1.

Witnesses.
Claude Kesler
John Cullen

Inventor.
Percival Everitt
By John J. Halsted & Son.
his Attys.

(No Model.) 2 Sheets—Sheet 2.

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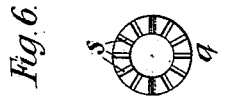

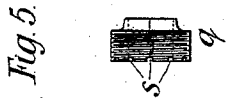

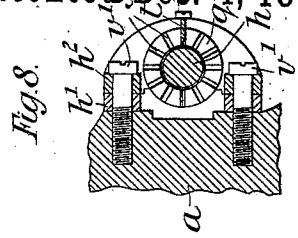

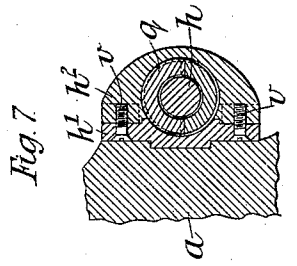

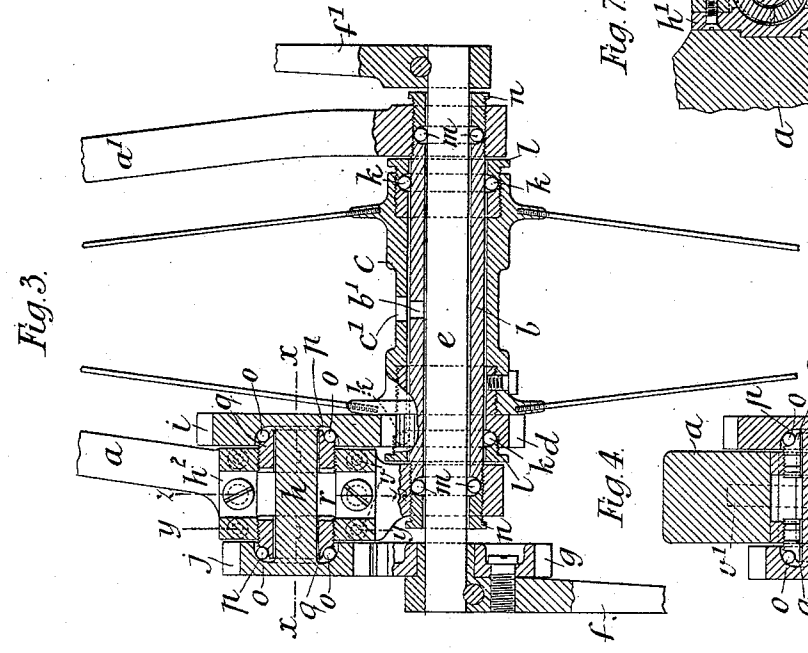

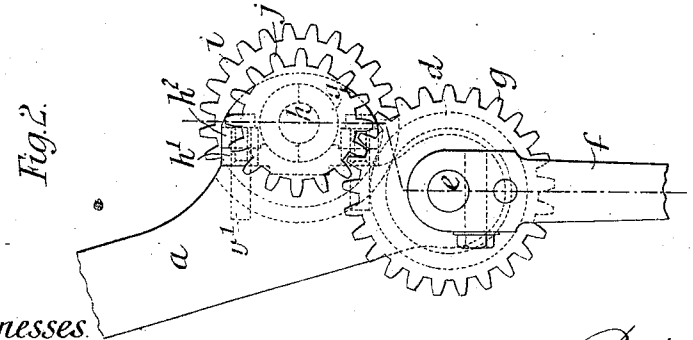

Witnesses.
Claude Kesler.
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By
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his Att'ys

UNITED STATES PATENT OFFICE.

PERCIVAL EVERITT, OF LONDON, ENGLAND; HENRY M. WOOLF ANCILLARY EXECUTOR OF SAID EVERITT, DECEASED.

VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 530,169, dated December 4, 1894.

Application filed June 8, 1892. Renewed November 2, 1894. Serial No. 527,753. (No model.)

To all whom it may concern:

Be it known that I, PERCIVAL EVERITT, a subject of the Queen of Great Britain, residing at London, England, have invented new and useful Improvements in Velocipedes, of which the following is a specification.

My invention relates to improvements in bicycles and other velocipedes of the kind in which the steering-wheel serves also as the driving-wheel and in which the pedal-shaft rotates within the hub of the driving-wheel to which motion is transmitted from the said pedal-shaft by means of gearing.

According to my invention instead of using the pedal-shaft as the axle of the said driving-wheel as heretofore I provide an independent axle in the form of a hollow sleeve which is firmly carried by the wheel-fork, upon which sleeve the driving-wheel rotates and within which sleeve the pedal-shaft rotates. I also provide an arrangement of gearing for transmitting motion from the pedal-shaft to the driving-wheel.

To enable my invention to be fully understood I will describe the same as applied to a bicycle.

In the accompanying drawings—Figure 1 is a side elevation of a bicycle provided with my improvements. Fig. 2 is a view drawn to an enlarged scale of the lower end of one arm of the driving-wheel-fork and of the gearing. Fig. 3 is a sectional view drawn to the same scale as Fig. 2, the section being taken on the line *w w* Fig. 1. Fig. 4 is a section on the line *x x* Fig. 3; and Figs. 5 and 6 are elevations at right angles to each other of a detail. Figs. 7 and 8 are sections on the lines *y y* and *z z* respectively of Fig. 3.

a, *a'* are the two arms of the driving-wheel-fork, and *b* is the sleeve upon which the hub *c* of the driving-wheel rotates, the said sleeve being firmly secured in the said arms by any suitable means. As shown in the drawings the ends of the said sleeve are screw-threaded (the screw upon one end being a right hand thread and upon the other end a left hand thread) and adapted to enter correspondingly screw-threaded holes in the end of the fork. The arms of the fork are sprung apart to allow the sleeve to be introduced between them, and are gradually drawn together as the sleeve is screwed up. Of course the sleeve is fixed in position with the wheel thereon, and to allow of screwing up the sleeve I form a hole *b'* therein to receive the pin of a suitable wrench and a corresponding hole *c'* in the hub *c*.

d is a gear-wheel attached to or formed integral with the hub *c*, and *e* is the pedal-shaft having the pedal-cranks *f*, *f'* secured thereto.

g is a gear-wheel secured to the crank *f*, and *h* is a countershaft carried in a bearing in the fork *a* and having fixed to it the gear-wheels *i*, *j* in gear with the gear-wheels *d*, *g* respectively.

With the arrangement hereinbefore described it will be obvious that when motion is imparted to the pedal-shaft *e* the motion thereof will be communicated from the wheel *g* through the wheel *j*, the countershaft *h* and the wheel *i* to the wheel *d* and consequently also to the driving wheel of the bicycle. It will also be obvious that if plain bearings are used, any workman skilled in the art to which my invention relates could readily carry out the same. As, however, it is advisable that ball-bearings should be used as far as possible I will describe how such ball-bearings may be applied.

To apply the balls *k*, *k* between the hub *c* of the driving-wheel and the sleeve *b* I form a recess in each end of the said hub and I confine the balls therein by means of nuts *l*, *l* which are screwed into the ends of the said hub. The balls *m*, *m* between the sleeve *b* and the pedal-shaft *e* are applied in the following manner, that is to say, the sleeve *b* has recesses formed in its ends and is made of such a length that it extends only about half way through the holes in the end of the fork in which the said sleeve is carried. The balls are confined in their respective recesses by means of nuts *n*, *n*.

The balls *o*, *o* for the intermediate shaft *h* are arranged in recesses *p*, *p* on the inside faces of the wheels *i*, *j* and they are confined therein by nuts *q*, *q* surrounding the shaft *h* and screwed into corresponding apertures in the bearing. In order to permit of introducing these nuts *q*, *q*, each of them is preferably formed in two parts rabbeted together, as shown in Figs. 5 and 6, to prevent them from

moving longitudinally relatively to each other. These two parts are placed around the shaft *h* in a recess *r* provided for the purpose and are then screwed into position by means of a wrench which engages with grooves or notches *s*, *s*, Fig. 6, formed therein. To prevent the nuts from moving after they have been screwed into position I provide a plate *t*, Figs. 4 and 8, which is adapted to engage with notches in the bearing and with one notch *s* of each of the nuts, the said plate being held in position by means of a screw *u*.

For convenience of construction I find it advantageous to make the bearing for the shaft *h* in two parts *h'*, *h*² separate from the fork and to connect them by screws *v*, *v*, as indicated most clearly in Fig. 7, and then to attach the said bearing to the fork by means of screws *v'*, as shown most clearly in Fig. 8.

The chief advantage of my invention is that by using the fixed sleeve *b* I provide great rigidity and avoid the excessive wear and friction which would take place if the driving-wheel were mounted directly upon the pedal-shaft as has hitherto been the custom in machines in which gearing has been used for transmitting the motion of the pedal-shaft to the driving-wheel mounted upon such axle.

Although I have described my invention as applied to a bicycle it is to be understood that it is also applicable to other velocipedes in which the front wheel serves as the driving-wheel.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. A driving wheel having a tubular axis running on a fixed cross-tube *b*, which directly connects the forks and is in immediate contact with the axle and by means of right and left hand threads serves to draw the arms of the fork toward each other,—combined with the crank-shaft extended through said tube and in direct contact therewith and supported on ball bearings of which this tube forms a part, the balls being lodged in recesses in the outer ends of this tube and in similar recesses in the inner ends of nuts *n* on the shaft, the forks having screw-threaded holes to receive these tightening nuts, all as shown and described.

2. In combination with the shaft and with the fixed sleeve *b*, placed in immediate contact therewith and on which sleeve the driving wheel rotates, the nuts *n*, on the shaft and the balls *m*, between such nuts and the ends of said sleeve,—the nuts *l*, on the hub of the driving wheel, and the balls *k*, held by said nuts within the ends of the hub, all substantially as and for the purposes set forth.

PERCIVAL EVERITT.

Witnesses:
G. F. REDFERN,
JOHN E. BOUSFIELD,
Of the firm of G. F. Redfern & Co., 4 South Street, Finsbury, London, Patent Agents.