

(No Model.)

2 Sheets—Sheet 1.

C. BYRNE.  
VELOCIPÈDE.

No. 527,404.

Patented Oct. 16, 1894.

FIG. 2.

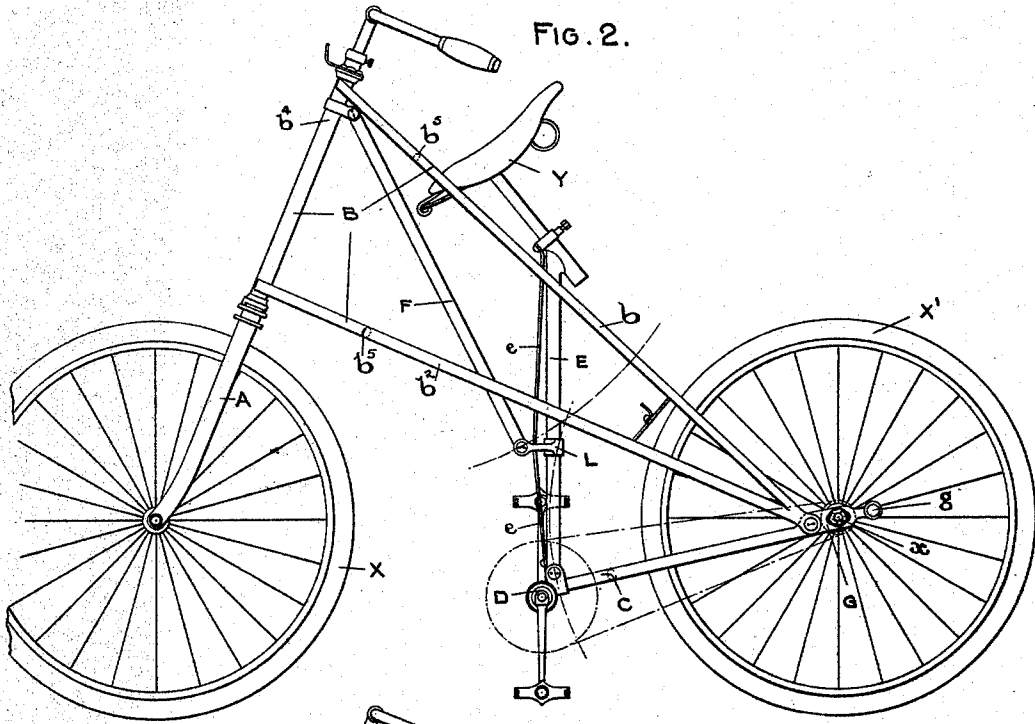
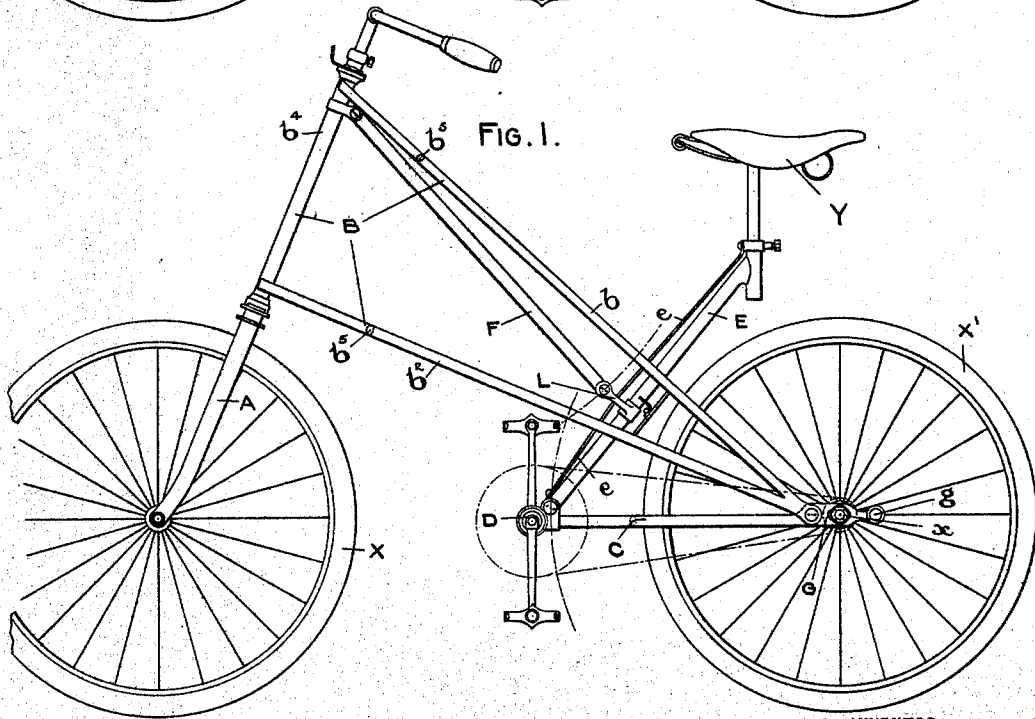


FIG. 1.



WITNESSES

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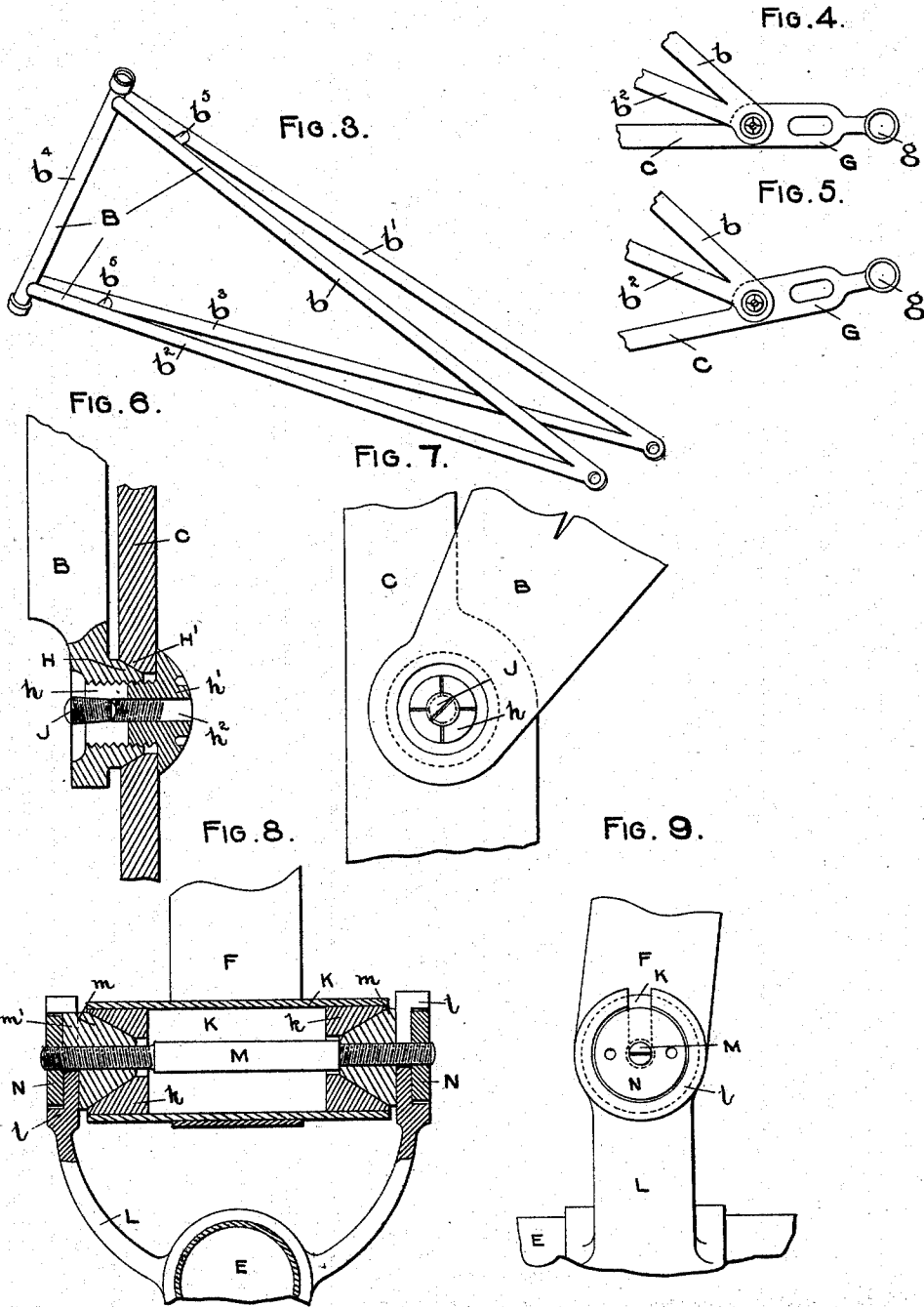
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# UNITED STATES PATENT OFFICE.

CHARLES BYRNE, OF LONDON, ENGLAND.

## VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 527,404, dated October 16, 1894.

Application filed June 30, 1894. Serial No. 516,192. (No model.) Patented in England May 7, 1894, No. 9,035.

*To all whom it may concern:*

Be it known that I, CHARLES BYRNE, a subject of the Queen of Great Britain, residing at London, in the county of Middlesex, England, have invented a new and useful Improvement in Velocipedes, (for which I have obtained a patent in Great Britain, No. 9,035, bearing date the 7th day of May, 1894,) of which the following is a full and complete specification.

My invention relates to an improved construction of velocipedes, and it consists in mounting the driving wheel, pedal-crank axle and saddle on a frame which is pivoted to and suspended from the main frame without the use of springs, and also in certain improvements in the details of construction, the object being to improve this type of velocipede by removing or overcoming its many known defects. I attain this end in the manner shown by the accompanying drawings which illustrate—by way of example—a rear-driving front steering safety bicycle constructed according to my invention.

Referring to the drawings, Figures 1 and 2, Sheet No. 1, are views in side elevation showing the frame carrying the saddle and pedal-crank axle in its extreme backward and forward position respectively. Fig. 3, Sheet No. 2, is a view in perspective of the main frame. Figs. 4 and 5, Sheet No. 2, are broken views in side elevation showing the extension of one of the members of the lower back fork to carry the step. Figs. 6 and 7, Sheet No. 2, are views in sectional plan and side elevation respectively—on an enlarged scale—showing the construction of the joint by which the lower back fork is connected to the main frame, and Figs. 8 and 9, Sheet No. 2, are views in sectional plan and side elevation respectively—on an enlarged scale—showing the construction of the other joints used in the frame of the machine.

Throughout the views similar parts are marked with like letters of reference.

The fork A carrying the front steering wheel X is of the usual description and presents no novel features. The main frame B consists of four straight tubes  $b$ ,  $b'$ ,  $b^2$ , and  $b^3$ , two of which  $b$  and  $b'$  depart from the top of the steering socket or head  $b^4$  and the other two  $b^2$  and  $b^3$  from the lower end thereof, each of the said pairs of tubes running straight to

and meeting at a point adapted to be pivoted to the fork C carrying the driving wheel X' and pedal-crank axle D, each pair  $b$ ,  $b^2$ , and  $b'$ ,  $b^3$ , of tubes forming a fork in which the driving wheel rotates. The tubes may if desired be coupled or braced together by one or more cross stays or bars  $b^5$ . The ends of the members of the fork C are slotted in the usual manner to receive the axle  $x$  of the driving wheel X' and the fork carries at its forward end a bearing bracket D for the pedal-crank axle. The fork C is pivoted to the frame B as near to the slots therein to receive the axle  $x$  of the driving wheel X' as is convenient. The tube E adapted to carry the saddle Y is pivoted to the forward end of the fork C as near to the bracket D carrying the pedal-crank axle as is convenient. The tube E is also pivoted at or about the center of its length to an arm or link F which is pivoted at its other end to the steering socket or head  $b^4$  or to any other convenient part of the forward end of the main frame B. It will thus be seen that the saddle is free to move backward and forward with respect to the pedal-crank axle thus enabling the rider to vary his position with respect thereto so as to utilize his strength in propelling the machine to the best possible advantage.

To brace the tube E and prevent it from bending under the weight of the rider when it assumes a position out of the vertical, it is trussed by means of one or more stays  $e$  passing over a bridge or its equivalent at or about the center of its length. The bracket L carrying or forming part of the hinge by which the tube E is pivoted to the arm or link F may conveniently form the bridge as shown by Figs. 1 and 2, Sheet No. 1.

On to the rear end of one of the members of the fork C beyond the slot to carry the axle  $x$  of the driving wheel is formed or fixed an extension or arm G, on the free end of which is mounted the step  $g$ . It will be seen that when the rider places his weight on the step—in the act of mounting—the saddle is brought from its forward position as shown by Fig. 2 to its most rearward position as shown by Fig. 1.

In order that the width of the tread be not increased I construct the various hinges in the following manner which gives great sta-

bility, large bearing surfaces and perfect adjustment.

I make the hinge by which the fork C is connected to the main frame B in the following manner:—On each of the ends of the double fork forming the main frame B I form or fix a male cone H the apex of which points inward, and at the rear ends of the members of the fork C at a point slightly in advance of the slots therein to receive the axle of the driving wheel are formed cone-shaped holes or female cones H', H', adapted to fit over or receive the cones H, H, on the main frame. The two cones forming each hinge are kept engaged with each other by means of a screw *h* passing through the cone H' and screwing into the cone H, the head *h'* of the screw bearing against the inner side of the fork C. The screw *h* is drilled out to form a hole *h*<sup>2</sup> which is threaded internally and the end of it is then split in one or more places as shown by Figs. 6 and 7, Sheet No. 2. To lock the screw *h* in position after the necessary adjustment of the coned hinge has been made, a tapered screw J is screwed into the hole *h*<sup>2</sup> to expand the screw *h* and thereby jam it into the threads of the cone H. As an alternative construction the male cones may be formed on or fixed to the ends of the members of the fork C and the female cones be made in the ends of the main frame B.

The other hinges of the frame are preferably constructed in the following manner:—One part of each hinge consists of a tube or socket K carrying female cones *k, k*, and the other part of the hinge consists of a crutch-shaped bracket L carrying a spindle M having male cones *m, m*, of the usual type—the one fixed thereon and the other adjustable thereon—which engage with the female cones *k, k*, and form an ordinary cone bearing. The ends *l, l*, of the brackets L, L, are slotted to receive the spindle M, and the adjustable cone *m* thereon is provided with a dowel pin or projecting piece *m'* adapted to engage with one of the said slotted ends *l, l*, to prevent it from turning or rotating on the spindle during adjustment. The outer faces of the slotted parts *l, l*, of the bracket are recessed to receive round nuts N, N, on the ends of the spindle M, so as to retain the spindle in position even after the said nuts have been slackened to allow of the adjustment of the bearing, which is effected by turning the spindle M by means of a screw driver slot in one or both of its ends. Balls or spheres may be interposed between the cones *k, k*, and *m, m*, to form ball bearings. It is immaterial which part of each hinge is carried by the main frame.

Those parts to which no special reference has been made present no novel features and may be of the ordinary construction.

I am aware that velocipedes have already been made with the parts of the frame carrying the pedal-crank axle and the saddle pivoted to the other part of the frame and controlled by springs and I do not therefore claim such as my invention, but

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

1. In a velocipede having a main frame B and a suspension frame formed of the members C, E and F, mounting the step *g* on an arm forming a rearward extension of one of the members of the fork C, as and for the purpose set forth.

2. In a velocipede having a frame consisting of a fork such as C carrying the driving wheel and pedal-crank axle bracket, a tube such as E carrying the saddle, and an arm or link such as F hinged together and suspended from the main frame B; forming or mounting an arm G on one of the members of the fork C to form a rearward extension thereof to carry the step *g*, as and for the purpose set forth.

3. In a velocipede, the combination of the frame B, of the fork C carrying the pedal-crank axle bracket D, of the tube E carrying the saddle Y and trussed by one or more stays *e*, of the arm or link F, of the extension G of one of the members of the fork C and of the step *g*, all combined arranged and adapted to operate, as and for the purpose set forth.

4. In a velocipede frame, the combination of the main frame B, of the fork C carrying the pedal-crank axle bracket D and pivoted to the main frame by cone bearings consisting of the following essential parts:—male cone H, female cone H', hollow split screw *h* and tapered screw J, of the extension or arm G on one of the members of the fork C of the step *g* mounted on the extension or arm G, of the tube E carrying the saddle Y trussed by one or more stays *e*, and of the link F connecting the tube E to the frame B, both pivoted to their respective parts by coned bearings consisting essentially of the following parts:—socket K, female cones *k, k*, crutch shaped bracket L having slotted ends, spindle M, male cones *m, m*, and flat round nuts N, all combined, arranged and adapted to operate as set forth.

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Witnesses:

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