No. 628,843. Patented July 11, 1899.

M. PEDERSEN.

BICYCLE.

(Application filed June 27, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 5

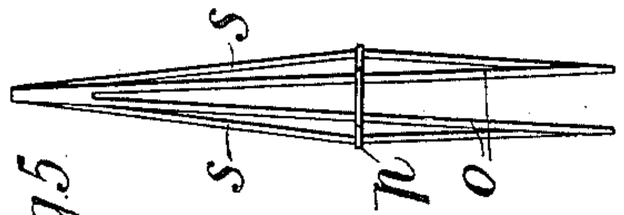


Fig. 6

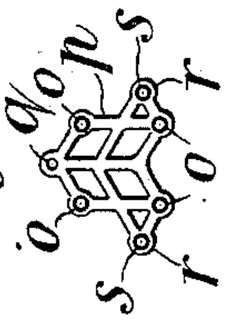


Fig. 1

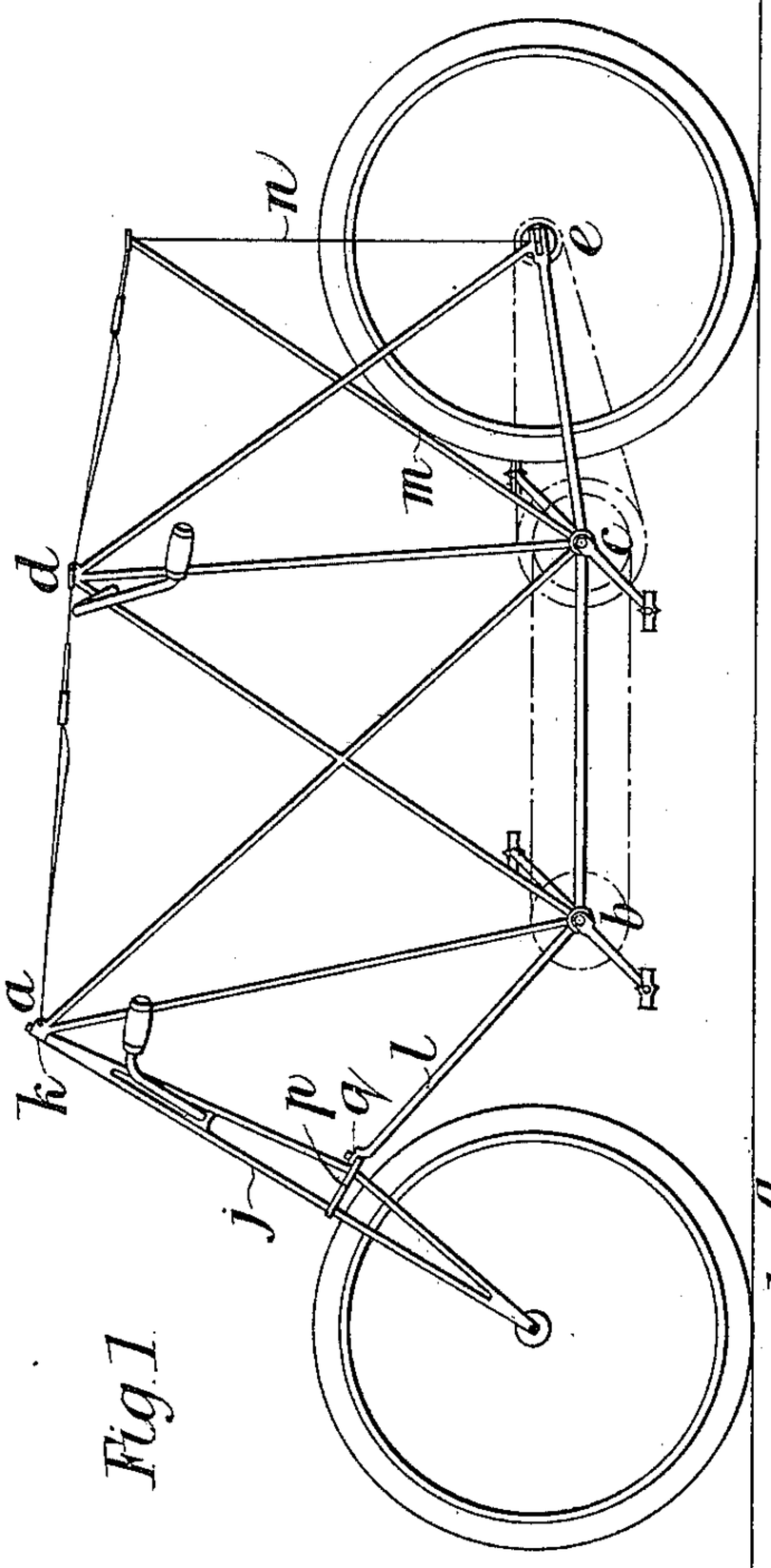
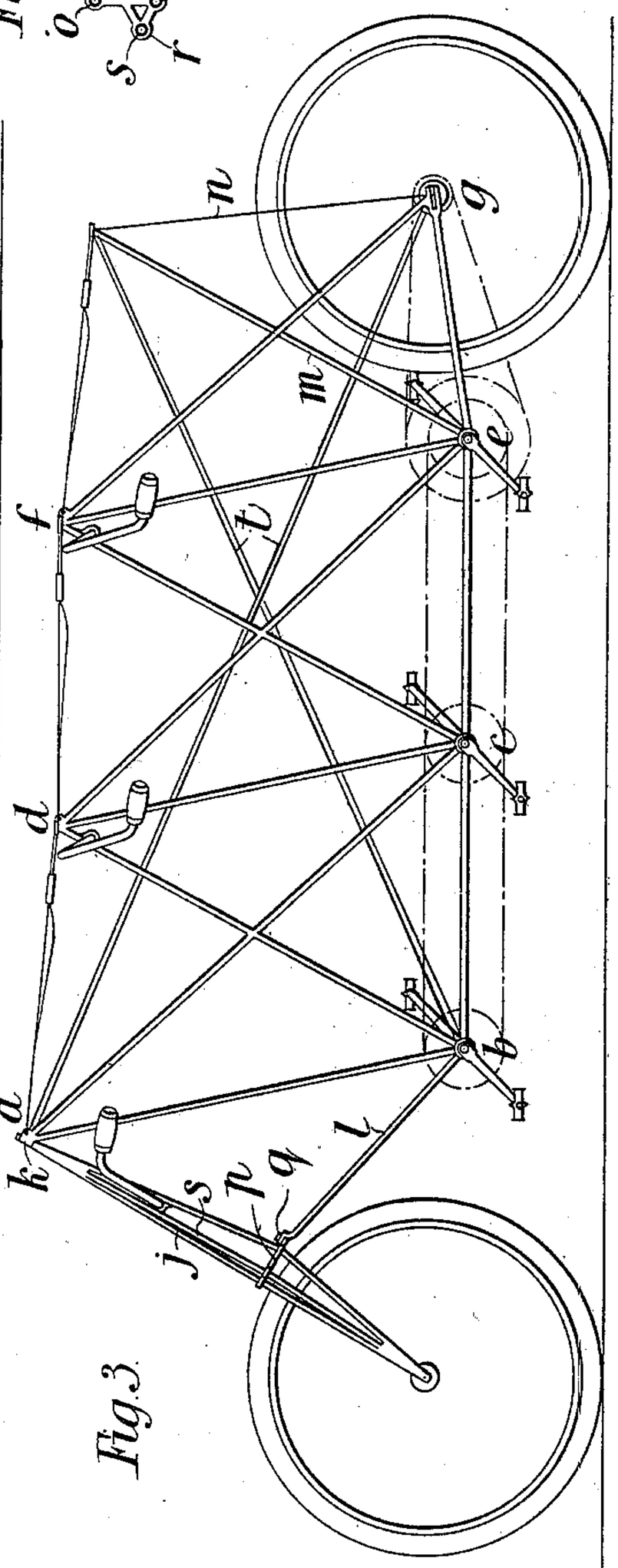


Fig. 3.



Witnesses.
E. J. Redfern
John E. Bousfield.

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M. PEDERSEN.

BICYCLE.

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(No Model.) 2 Sheets—Sheet 2.

Fig. 2.

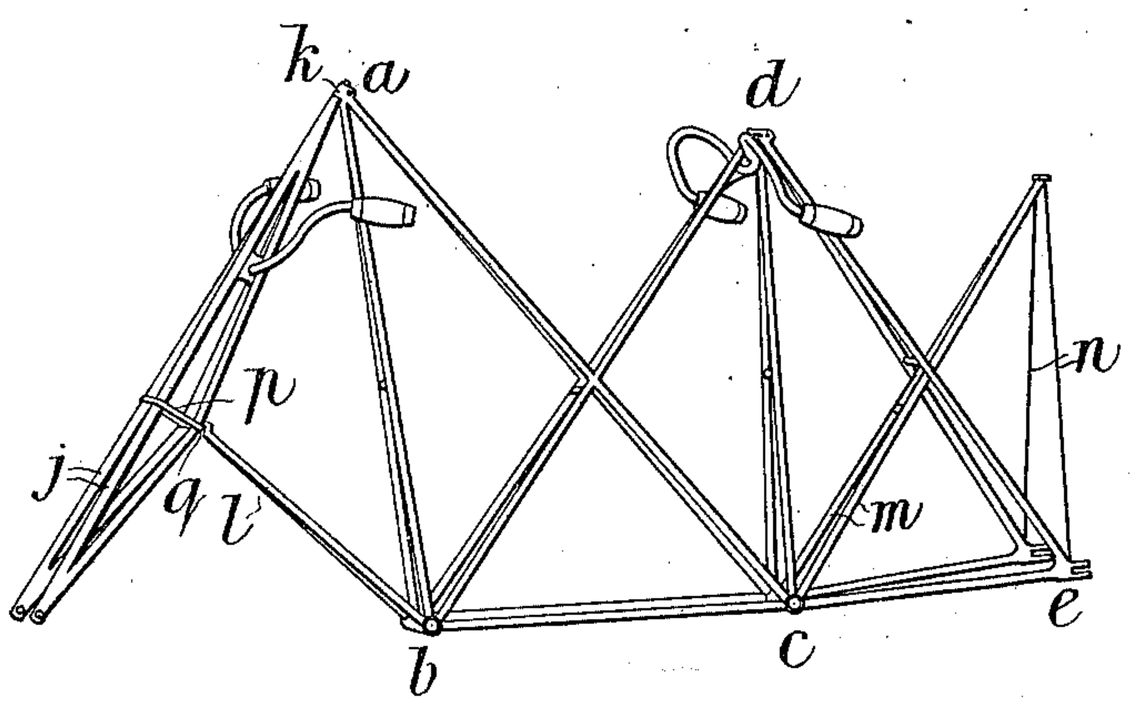
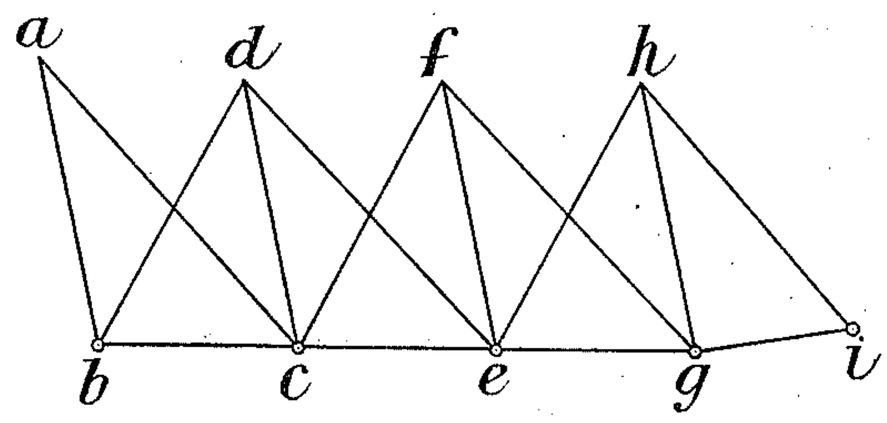


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

MIKAEL PEDERSEN, OF DURSLEY, ENGLAND.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 628,843, dated July 11, 1899.

Application filed June 27, 1898. Serial No. 684,601. (No model.)

To all whom it may concern:

Be it known that I, MIKAEL PEDERSEN, a subject of the King of Denmark, residing at Dursley, England, have invented new and useful Improvements in Bicycles, (for which I have applied for a patent in Great Britain, No. 28,485, dated December 2, 1897,) of which the following is a specification.

My invention relates to tandem, triplet, quadruplet, and other bicycles intended for two or more riders, the object of my invention being to construct a frame which is light and strong.

A frame constructed according to my invention may be regarded as being composed of a series of triangles which are arranged in the novel manner hereinafter described, so as to mutually support and strengthen one another.

In the accompanying drawings, Figure 1 is a side elevation of a tandem bicycle provided with my improved frame, and Fig. 2 is a perspective view of the frame. Fig. 3 is a side elevation of a triplet bicycle, and Fig. 4 is a diagram illustrating the principle of construction of my frame. Figs. 5 and 6 are respectively an elevation and a sectional plan, drawn to a larger scale, illustrating a detail of the construction.

Referring first to Fig. 4, *a b c*, *d b c*, *d c e*, *f c e*, *f e g*, *h e g*, and *h g i* indicate a series of triangles such as are used in the construction of a bicycle-frame. The bars forming the bases of the several triangles are united to suitable sockets for carrying the crank-axle bearings, the said base-bars and sockets when united practically forming a continuous bar. The sections of this bar between the pairs of bearings each form the common base of two triangles with the exception of the rear section *g i*—that is to say, the section *b c* has upon it the triangles *a b c*, *d b c;* the section *c e*, the triangles *d c e*, *f c e;* the section *e g*, the triangles *f e g*, *h e g*, and the section *g i* the triangle *h g i*.

It will be noticed that all the triangles, with the exception of the front triangle *a b c*, are arranged so that two triangles on adjacent sections have a common bar—that is to say, the triangles *d b c*, *d c e* on the sections *b c*, *c e* have the common bar *d c*, the triangles *f c e*, *f e g* on the sections *c e*, *e g* have the common bar *f e*, and the triangles *h e g*, *h g i* on the sections *e g*, *g i* have the common bar *h g*. All the bars are composed of double tubes united to suitable sockets and also united at any points where the tubes cross or intersect one another.

The bicycle shown in Figs. 1 and 2 being only a tandem is composed of only three triangles. The front-wheel fork *j* is at its upper end pivoted or jointed in a socket *k* at the apex *a* of the front triangle and at a point between its two ends to a pair of bars *l*, projecting from the front socket at the angle *b* of the front triangle. The axle for the rear wheel is carried at the angle *e* of the rear triangle *d c e*. The seat for the front rider is suspended between the apices *a* and *d* and for the rear rider between the apex *d* and the extremity of an additional pair of bars or backstay *m*, which project or projects from sockets of the angle *c*, the said bars being connected by a tension-brace *n* to the extremity *e* of the rear triangle.

In the case of the triplet bicycle shown in Fig. 3 the frame is composed of five triangles, the front-wheel fork and the rear-seat backstay being attached in the manner hereinbefore described.

It will be understood that in the case of a quadruplet the frame will be composed of seven triangles, in the case of a quintet bicycle of nine triangles, and so on.

It may be advantageous in some cases to strengthen the front fork against the lateral displacement which might be produced when several riders are running at a high speed. In this case I advantageously truss the front fork in a manner which will be clearly understood by reference to Figs. 5 and 6. In these figures, *o o o o* are the four tubes of which the front fork is usually composed, and *p* is the plate which braces the said tubes together and to which the pair of bars *l* is pivoted at *q*. In order to strengthen the fork, I provide the plate *p* with the projecting pieces *r r*, through which the truss wires or rods *s s*, secured to the upper or lower ends of the fork, are passed in a manner which will be readily understood by reference to the drawings.

When additional strength is required, I sometimes arrange tie-bars *t t*, as shown in Fig. 3, between the apex of the front trian-

gle and the back-wheel axle and between the rear end of the back-seat stay and the front-crank-axle socket.

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 bicycle-frame built up of a series of bars arranged in the form of triangles, the bases of which triangles form a continuous horizontal bar, the sections of said bar forward of the rear section each forming the common base of two triangles, each triangle in rear of the front triangle on the front section, having one of its sides common to two triangles of adjacent sections, crank-axle bearings located on said continuous bar, a front stay extending from the forward-crank-axle bearing, a back stay extending from the rear-axle bearing, the rear-triangle base being formed in a fork to receive the rear wheel, and a tension-brace for the rear stay, substantially as described.

2. A bicycle-frame built up of a series of bars arranged in the form of triangles, the bases of which triangles form a continuous horizontal bar, the rear-triangle base being formed in a fork to receive the rear wheel, the sections of said bar, forward of the rear section, each forming the common base of two triangles, each triangle in rear of the front triangle on the forward section, having one of its sides common to two triangles on adjacent sections, crank-axle bearings on said continuous bar, a device on the apex of the front triangle to pivotally engage the front fork, a front stay extending forward from the said continuous bar, provided with means for pivotally engaging the front fork, a back stay, a brace for the back stay, the apices of said triangles and said rear stay being provided with devices for supporting saddles, and a diagonal tie-bar extending from each end of the continuous horizontal bar to the upper portion of the frame at the opposite end of the same, substantially as described.

3. A bicycle-frame built up of a series of bars forming triangles, the bases of said triangles forming a continuous bar, the rear-triangle base of which forms a fork for the rear wheel, the crank-axle bearings at the ends of said triangle-bases, each section of the said bar forward of the rear section forming the common base of two triangles, each triangle in rear of the front triangle of the forward section having one of its sides common to two triangles on adjacent sections, the bars forming the sides of the triangles being composed of double tubes united by suitable sockets, the apex of the front triangle being provided with means for pivotally engaging the front fork, a front stay extending forward from the front-triangle base and provided with means for pivotally engaging the front fork, a back stay extending from the rear-axle bearing, a tension-brace for the back stay, the apices of the triangles and said back stay being provided with devices for supporting saddles, a diagonal tie-bar extending from the forward crank-hanger to the upper end of the back stay, and a similar tie-bar extending from the rear end of the horizontal bar to the apex of the forward triangle, substantially as described.

MIKAEL PEDERSEN.

Witnesses:
G. F. REDFERN,
JOHN E. BOUSFIELD.