(No Model.) 4 Sheets—Sheet 1.

E. BAUM, M. SAPO & I. STERNSEHR.

BICYCLE FRAME.

No. 584,316. Patented June 15, 1897.

Fig. 1.

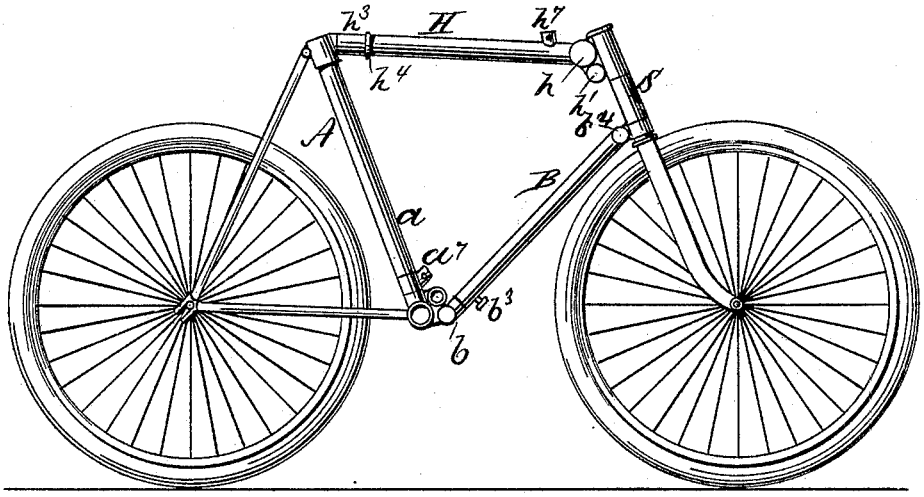
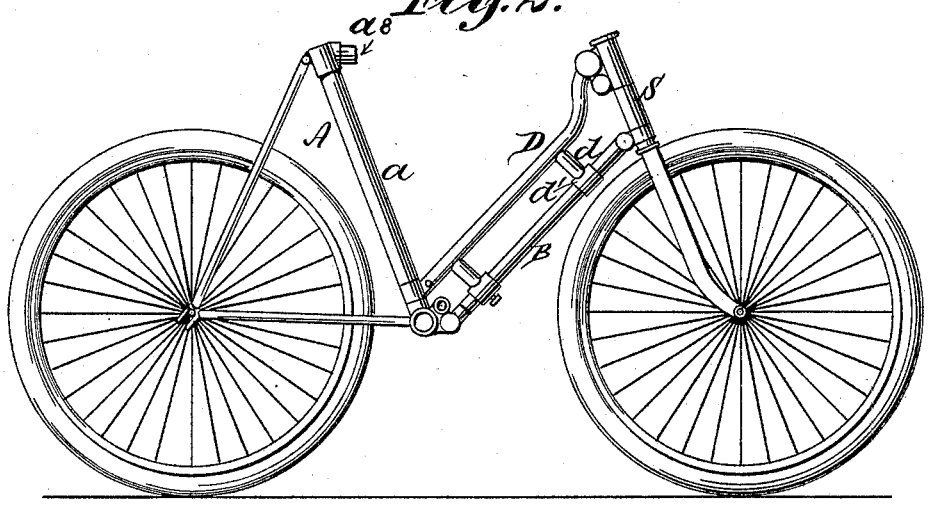


Fig. 2.



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4 Sheets—Sheet 2.

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BICYCLE FRAME.

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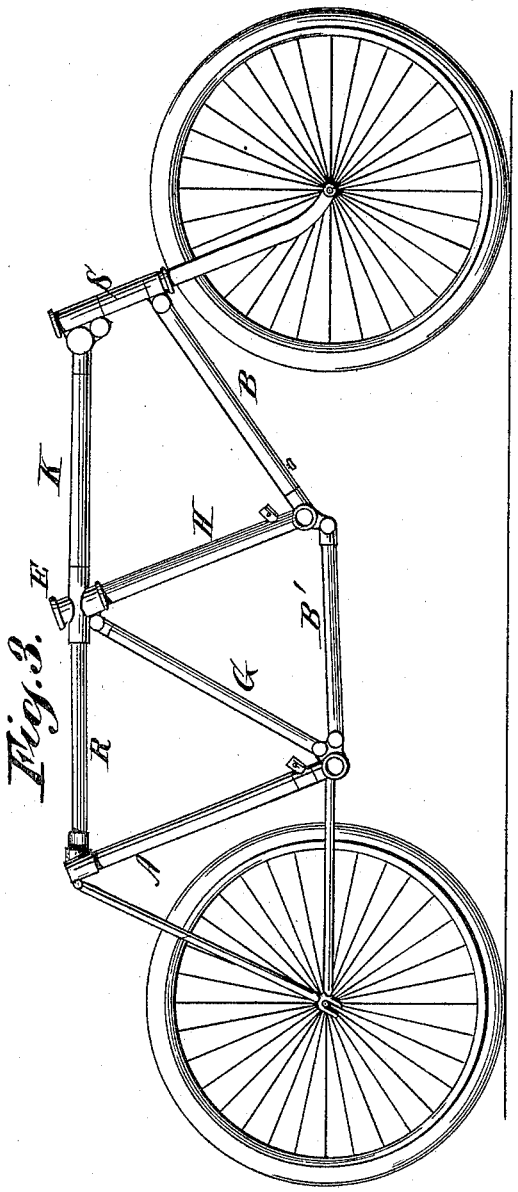

Fig. 3.

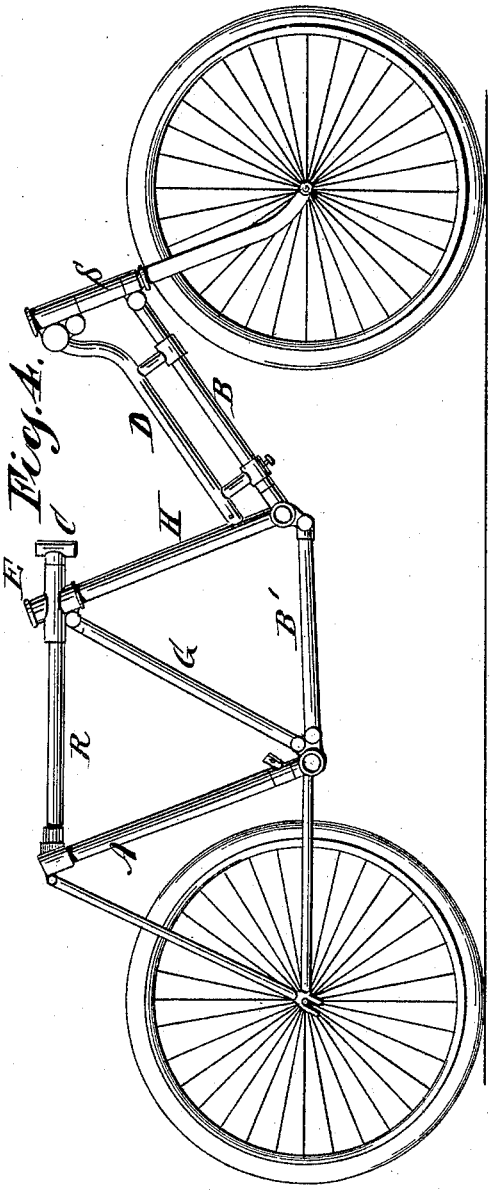

Fig. 4.

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(No Model.) 4 Sheets—Sheet 3.

E. BAUM, M. SAPO & I. STERNSEHR.

BICYCLE FRAME.

No. 584,316. Patented June 15, 1897.

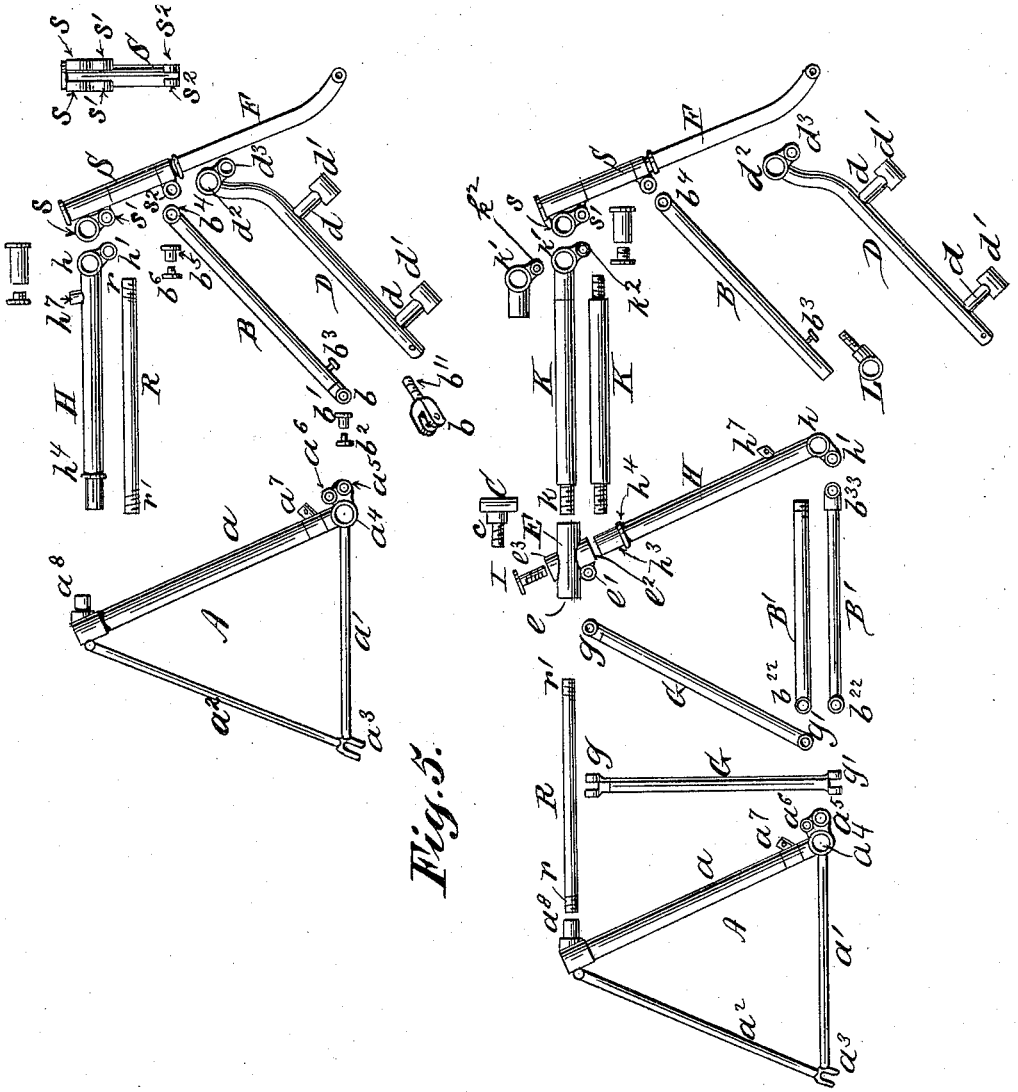

Fig. 5.

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(No Model.) 4 Sheets—Sheet 4.

E. BAUM, M. SAPO & I. STERNSEHR.

BICYCLE FRAME.

No. 584,316. Patented June 15, 1897.

Fig. 6.

Fig. 7.

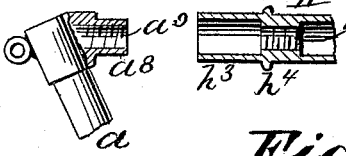

Fig. 8.

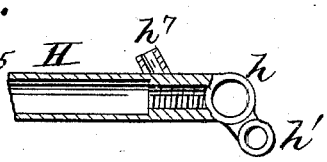

Fig. 9.

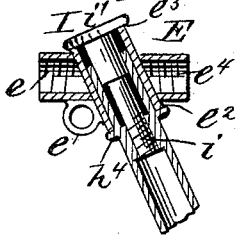

Fig. 10.

Fig. 11

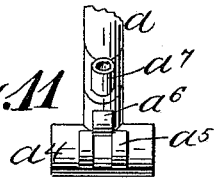

Fig. 13.

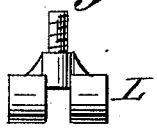

Fig. 14.

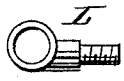

Fig. 12.

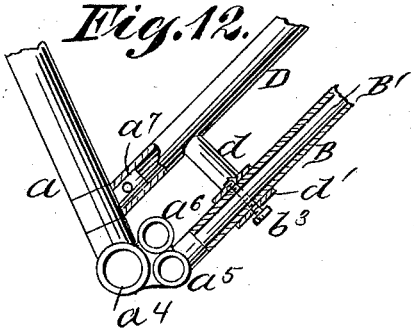

Fig. 15.

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UNITED STATES PATENT OFFICE.

ELIAS BAUM, OF BLOOMFIELD, NEW JERSEY, AND MORIS SAPO AND ISRAEL STERNSEHR, OF NEW YORK, N. Y.

BICYCLE-FRAME.

SPECIFICATION forming part of Letters Patent No. 584,316, dated June 15, 1897.

Application filed August 8, 1896. Serial No. 602,127. (No model.)

To all whom it may concern:

Be it known that we, ELIAS BAUM, of Bloomfield, in the county of Essex and State of New Jersey, and MORIS SAPO and ISRAEL STERNSEHR, residing in the city, county, and State of New York, all citizens of the United States, have invented certain new and useful Improvements in Bicycle-Frames, of which the following is a specification sufficient to enable others skilled in the art to which the invention appertains to make and use the same.

Our invention relates to bicycle-frames, the object being to provide for the transformation and use of the frame, either as a single-diamond frame for a male rider, a single drop-frame for a female rider, a tandem double-diamond frame for two male riders, or a tandem diamond and drop frame for male and female riders; and the invention consists in the special construction, combination, and arrangement of parts, substantially as hereinafter described and claimed.

The accompanying drawings show the embodiment of the essential features of our invention in practical form, although we do not confine ourselves to the identical construction and configuration of parts shown, since it is obvious that variations may be made therein without departing from the spirit and intent of our invention.

Figure 1 is an elevation showing the parts arranged to form a single-diamond frame; Fig. 2, a similar view showing the parts arranged to form a single drop-frame. Fig. 3 is a similar view showing the parts arranged to form a double-diamond tandem-frame; Fig. 4, a similar view showing the parts arranged to form a diamond and drop tandem frame. Fig. 5 shows the parts detached and in detail. Figs. 6 to 15 are detail views upon a larger scale.

The parts forming the rear triangular frame A are assembled permanently for all forms of the frame and consist of the seat-post a and the two forks a' a^2. This rear triangle A is formed with the bifurcations a^3 for straddling the axle of the rear or drive wheel, with the bearing a^4 for the treadle-shaft, with the knuckles a^5 a^6 for connection with other parts of the frame, with the stud a^7 for engaging with the lower end of the braces D and G, and with the stud a^8 formed with the interior thread a^9.

The steering-head S is formed with the double knuckles s, s', and s^2 and is itself hollow to receive the spindle of the fork F in the usual manner.

In assembling the parts for the single-diamond frame shown in Fig. 1 the double knuckles b on the end of the tubular brace-rod B are connected to the single knuckles a^5 on the rear triangle frame A by means of the pintlet b' and screw-cap b^2. The double knuckles b are formed with a shank b^{11}, which screws into the lower end of the rod B and is locked by a thumb-screw b^3. The upper end of the brace B is formed with the single knuckle b^4, which is coupled to the double knuckles s^2 s^2 on the steering-head S by the pintlet b^5 and cap b^6. The single knuckles h h' on the forward end of the brace H are secured to the double knuckles s s' on the steering-head S by pintlets and caps.

The threaded end r of the tube R is screwed into engagement with the female screw-thread in the forward end of the brace H, and the screw-thread r' of the tube R is made to engage with the female screw-thread a^9 in the stud a^8, the rear end of the brace H passing over said stud, as will be understood by reference to Figs. 7, 8, and 10, inclusive. Thus the parts are positively locked together by the rod R, which also strengthens and reinforces the frame as a whole.

In changing the frame to the single-drop form shown in Fig. 2 the brace H is removed and the drop-brace D is substituted, the sleeves d' d' on the lateral arms d d engaging the brace B, the single knuckles d^2 d^3 on the upper end being coupled to double knuckles s s' upon the steering-head S, and the lower end of the brace D passing over and being secured to the stud a^7 by a pin or other mechanical expedient. In this simple drop-frame the knuckle b is removed and a reinforcing and strengthening tube B' is inserted in the brace B, said strengthening-tube B' being formed with the knuckle b^{22} for engagement with the knuckles a^5 on the triangular frame A and being secured in place by a screw

b^3, passing through the lower sleeve d' and both the tubes B B', as will be understood by reference to Fig. 12.

The socket-piece C for the reception of the seat-post is secured to the stud a^8 by means of its screw c, which engages with a female screw a^9 in the stud a^8.

In forming the parts into a double-diamond tandem-frame, as shown in Fig. 3, the screw-thread r' of the tube R is made to engage with the female screw-thread a^9 in the stud a^8 of the triangular frame A, while the other end of the tube R, formed with the screw-thread r, is made to engage with a female screw-thread e, formed in the rear end of the cross-coupling E. The double knuckles g of the brace G are coupled to the single knuckle e' of the cross-coupling E by a pintlet and cap, while the double knuckles g' of the brace G are connected with the single knuckle a^6 on the triangular frame A also by means of a pintlet and cap. The end h^3 of the brace H is passed into the transverse socket e^2 of the cross-coupling E until its flange h^4 rests against the edge of the socket e^2, in which position it is secured by the screw-coupling I, the inner end of which is formed with a male screw-thread i, which engages with the female screw-thread h^5 in the brace H, while its outer end is formed with the head or bearing i', which rests against the upper edge e^3 of the transverse socket of the cross-coupling E. The single knuckle b^{22} of the brace-tube B' is coupled to the double knuckles a^5 of the triangular frame A, while the double knuckles b^{33}, screwed onto the other end of the said tube B', are coupled to the single knuckles h' on the brace H. The threaded end k of the tubular brace K is screwed into engagement with the female screw-thread e^4 in the cross-coupling E, while its knuckles k' k^2 are coupled to the knuckles s s' of the steering-head S, and the double knuckle L (substituted for the knuckle b) at the lower end of the tubular brace B is coupled to the single knuckle h of the tubular brace H, the single knuckle b^4 of the brace B being coupled to the double knuckles s^2 of the steering-head S. In this double-diamond tandem-frame the knuckles h and L constitute the forward treadle-shaft support, the bearing-box coupling the said knuckles h L together.

In adapting the frame to the diamond and drop tandem shown in Fig. 4 the triangular frame A, braces R G H B B', and the steering-head S are arranged and connected as in Fig. 3, the brace K being omitted and the drop-brace D being substituted therefor. In doing this the said drop-frame is connected with the steering-head S and the brace B, as in the description of Fig. 2, the lower end of the drop-brace D being pinned to the stud h^7.

It will be seen that by our construction and arrangement of parts the framework for either of the four forms of bicycle mentioned may be readily assembled and secured together, thus providing for all the requirements of general use with practically a single machine.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. A bicycle provided with a drop-bar having depending posts provided with sleeves through which passes the tubular bottom frame-bar, in combination with a removable brace-rod secured within the said bottom bar; substantially as described.

2. In a convertible bicycle, the tubular bar H having front and rear internal threads, and provided at the front end with knuckles h h' and the brace-rod R threaded at the ends and adapted to secure the bar H to the seat-post when used as the top bar of a single-diamond frame and to take the place of said bar H when the latter is used as the front seat-bar of a tandem frame; the knuckle h then serving as the front treadle-shaft bearing, substantially as set forth.

3. In a convertible bicycle, the tubular bar B, the brace-bar B' therein and the several knuckles b b^4, b^{22}, b^{33}, and L, adapted for coupling the bars B, and B', to the frame when used one within the other as a bottom bar of a single frame or when used separately as bottom bars of a tandem frame.

4. In a convertible bicycle, the cruciform coupling E, having threaded front and rear members e e^4, for the threaded ends of the top bars, the non-threaded upper and lower members e^3, e^2, in combination with the interchangeable bar H, fitting at the upper end in the member e^2, and having internal threads h^5, and a screw I, passed down through said member e^3, into engagement with the threads h^5, substantially as set forth.

5. A convertible bicycle comprising the rear triangular frame A having bearing a^4, knuckles a^5 a^6 and threaded stud a^8, cruciform coupling E, coupling-screw I, brace G, interchangeable rods R, H, the latter having knuckles h, h', at its lower end and internally threaded for screw I, and rod R, the steering-head S, having knuckles s, s', s^2, the knuckled rods B B', adapted to be used separately or one within the other as set forth, and the interchangeable top bar K and drop-bar D knuckled at their forward ends to engage knuckles s s', and means for coupling the several interlocking knuckles, substantially as set forth.

6. The combination, with the bicycle-frame having a coupling knuckle or projection on the rear side of the steering-head and coupling projections or studs on the upper and lower portions of the seat-post, and the straight top bar removably coupled at its ends to the said steering-head knuckle and upper seat-post projection, of a separate and independent drop-bar D adapted for coupling with the knuckle or projection on the steering-post and the said lower projection on the seat-post upon the removal of the straight top bar; said drop-bar having braces for connecting it with the bottom frame-bar, substantially as set forth.

7. The combination of the triangular frame

A, formed with the knuckles a^5, and stud a^8, formed with the internal screw-thread a^9; the brace H, formed with the knuckles h, h'; the tube R, formed with the screw-threads r, r'; the steering-head S, formed with the knuckles s, s', and s^2; the brace B, formed with the knuckles b, and b^4; and the pintlets and screw-caps for coupling the knuckles, substantially in the manner and for the purpose described.

8. The combination of a triangular frame A, formed with the knuckles a^5, and stud a^7; drop-frame D, formed with the knuckles d^2, d^3, and lateral arms and sleeves d, d'; the brace B, formed with the knuckle b^4; the brace B', formed with the knuckle b^{22}; the coupling-screw b^3; the steering-head S, formed with the knuckles s, s', s^2; and the pintlets and screw-caps for coupling the knuckles, substantially in the manner and for the purpose described.

9. The combination of a triangular frame A, formed with the knuckles a^5, stud a^7, and stud a^8, formed with the internal screw-thread a^9; the seat-post socket C, formed with the threaded shank c; drop-frame D, formed with the knuckles d^2, d^3, and lateral arms and sleeves d, d'; the brace B, formed with the knuckles b^4; the brace B', formed with the knuckle b^{22}; the coupling-screw b^3; the steering-head S, formed with the knuckles s, s', s^2; and the pintlets and screw-caps for coupling the knuckles, substantially in the manner and for the purpose described.

10. The combination of the triangular frame A, formed with the knuckles a^5, a^6, and stud a^8, formed with the internal screw-thread a^9; the tube R, formed with the screw-threads r, r'; the cross-coupling E, formed with the screw-threads e, e^4, and knuckle e'; the brace H, formed with the knuckles h, h', and flange h^4; the screw-coupling I, formed with the screw-thread i, for engaging with the female screw-thread h^5 in the brace H, and with the flange i', for bearing against the upper end of said coupling E; the brace G, formed with the knuckles g, g'; the brace B', provided with the knuckles b^{22}, b^{33}; the brace K, provided with the screw-thread k, and knuckles k', k^2; the steering-head S, formed with the knuckles s, s', s^2; the brace B, provided with the knuckles b^4, and L; and the pintlets and screw-caps for coupling the knuckles, substantially in the manner and for the purpose described.

11. The combination of the triangular frame A, formed with the knuckles a^5, a^6, and stud a^8, formed with the internal screw-thread a^9; the tube R, formed with the screw-threads r, r'; the cross-coupling E, formed with the knuckle e', and the screw-thread e; the brace H, formed with the knuckles h, h', stud h^7, and shoulder h^4; the screw-coupling I, formed with the screw-thread i, for engaging with the screw-thread h^5 in the brace H, and with the flange i', for bearing against the upper end of said coupling E; the brace G, formed with the knuckles g, g'; the brace B', provided with the knuckles b^{22}, b^{33}; the drop-frame D, provided with the knuckles d^2, d^3, and lateral arms and sleeves d, d'; the brace B, provided with the knuckles b^4, and L; the coupling-screw b^3; the steering-head S, provided with the knuckles s, s', s^2, and the pintlets and screw-caps for coupling the knuckles, substantially in the manner and for the purpose described.

12. The combination of the triangular frame A, formed with the knuckles a^5, a^6, and stud a^8, formed with the internal screw-thread a^9; the tube R, formed with the screw-threads r, r'; the cross-coupling E, formed with the knuckle e', and the screw-threads e and e^4; the seat-post socket C, formed with the threaded shank c; the brace H formed with the knuckles h, h', stud h^7, and shoulder h^4; the screw-coupling I, formed with the screw-thread i, for engaging with the screw-thread h^5 in the brace H, and with the flange i', for bearing against the upper end of said coupling E; the brace G, formed with the knuckles g, g'; the brace B', provided with the knuckles b^{22}, b^{33}; the drop-frame D, provided with the knuckles d^2, d^3, and lateral arms and sleeves d, d'; the brace B, provided with the knuckles b^4, and L; the coupling-screw b^3; the steering-head S, provided with the knuckles s, s', s^2, and the pintlets and screw-caps for coupling the knuckles, substantially in the manner and for the purpose described.

13. The combination of the triangular frame A, formed with the knuckles a^5, a^6, stud a^7, and stud a^8, formed with the internal screw-thread a^9; the tube R, formed with the screw-threads r, r'; the brace H, formed with the knuckles h, h', stud h^7, and flange h^4; the cross-coupling E, formed with the screw-threads e, e^4, and knuckle e'; the screw-coupling I, formed with the thread i, and the flange i'; the brace G, formed with the knuckles g, g'; the brace B', and knuckles b^{22}, b^{33}; the brace K, formed with the screw-thread k, and knuckles k', k^{11}; the steering-head S, formed with the knuckles s, s', s^2; the brace B, provided with the knuckles b^4, b, and L; the coupling-screw b^3; the drop-frame D, formed with the knuckles d^2, d^3, and transverse arms and sleeves d, d'; the seat-post socket C, having the threaded shank c, and the pintlets and screw-caps for coupling the knuckles, substantially in the manner and for the purpose described.

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