

(No Model.)

F. ARCHER & A. S. BOWLEY.
VELOCIPÈDE.

No. 447,099.

Patented Feb. 24, 1891.

Fig. 1

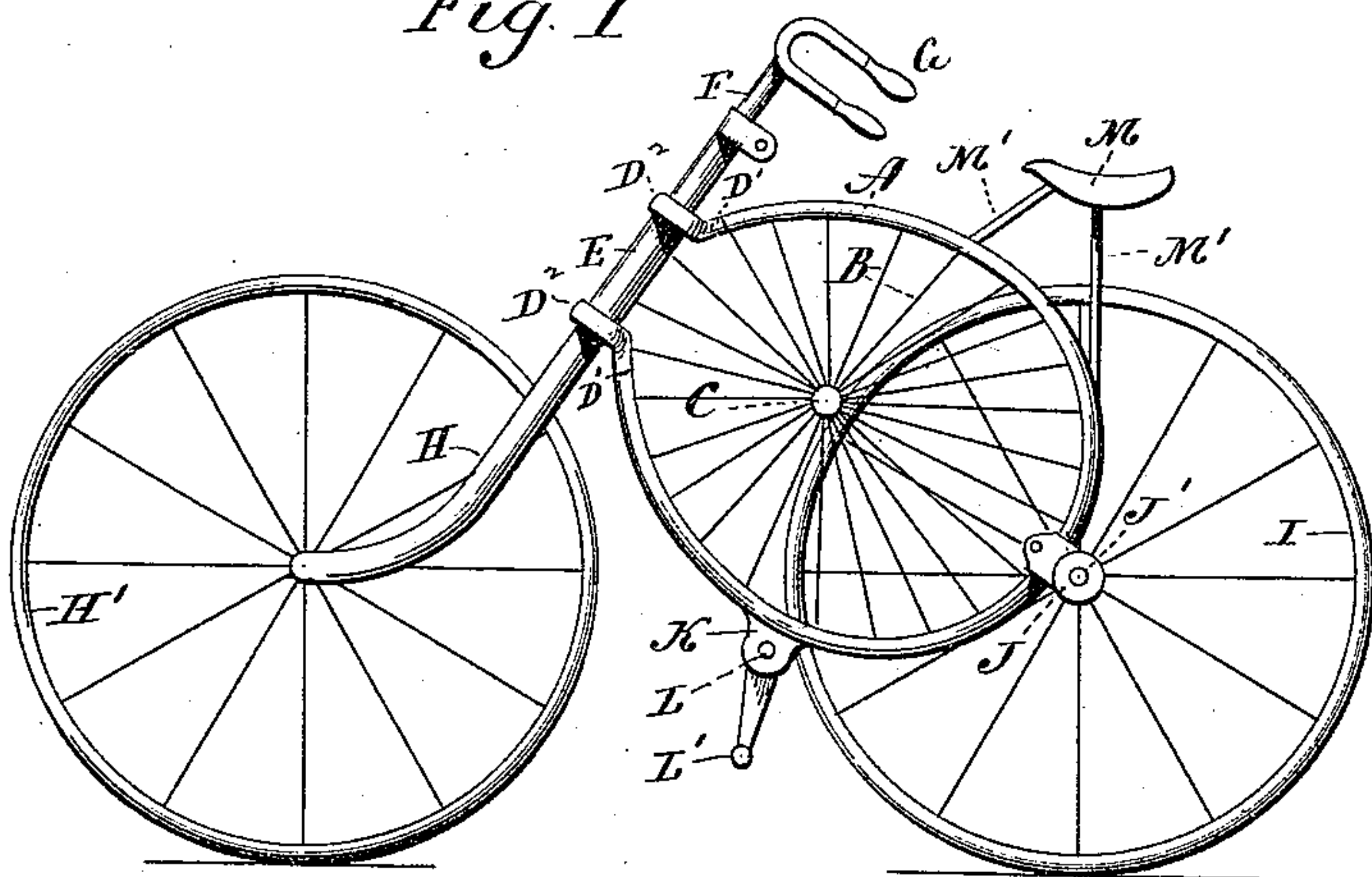


Fig. 5

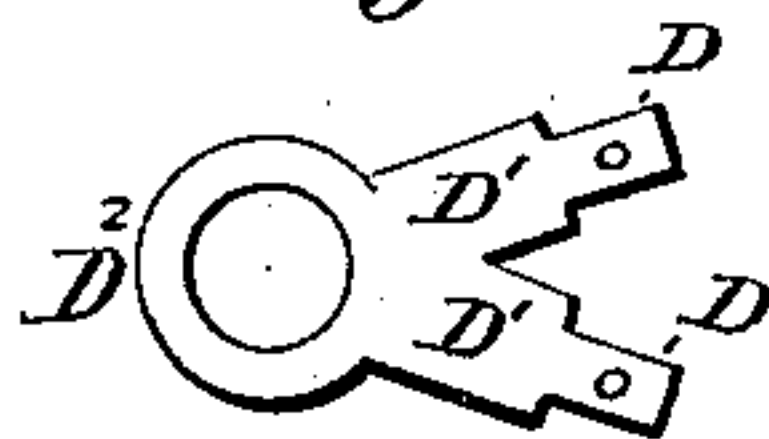


Fig. 6

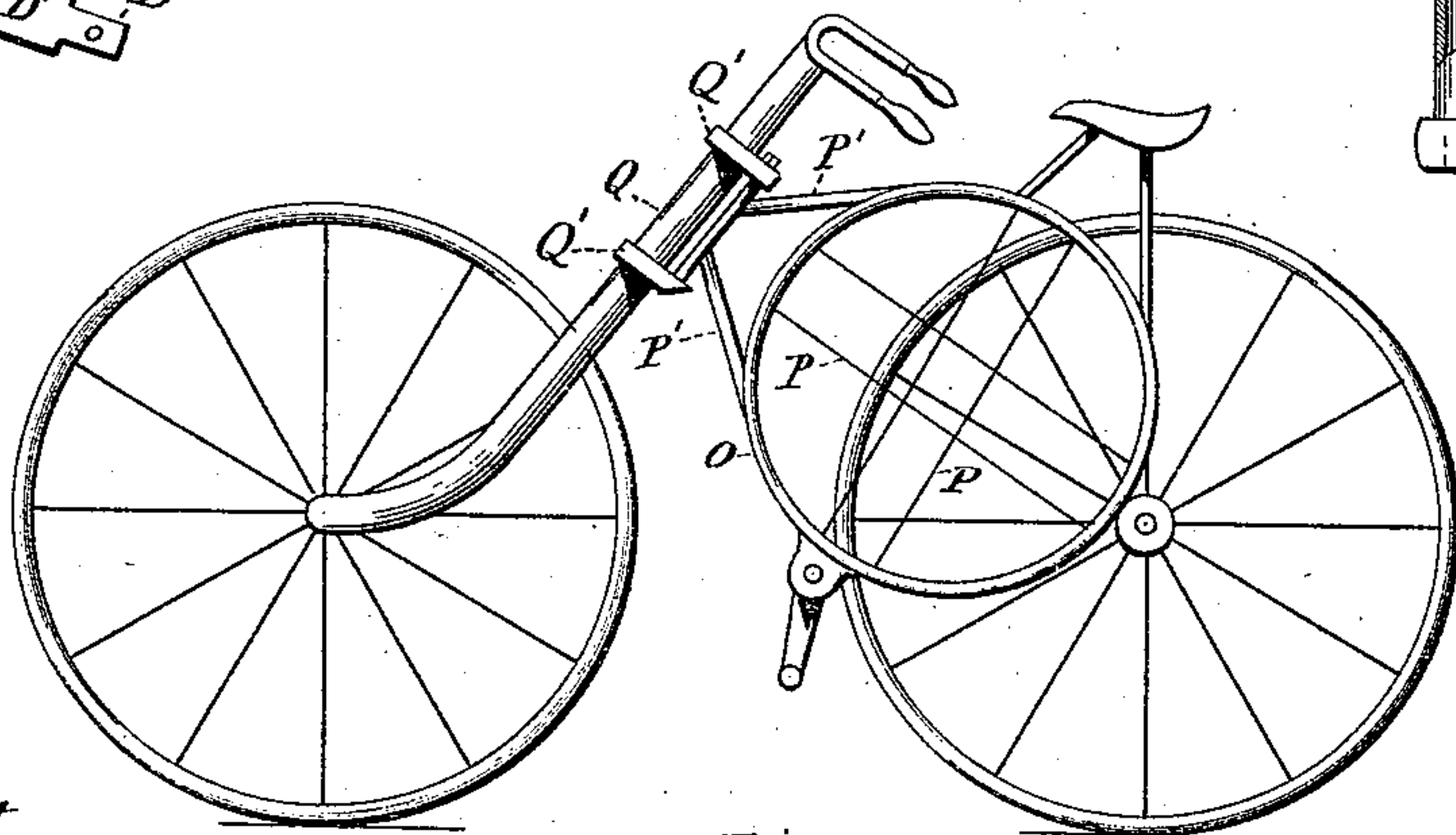


Fig. 3

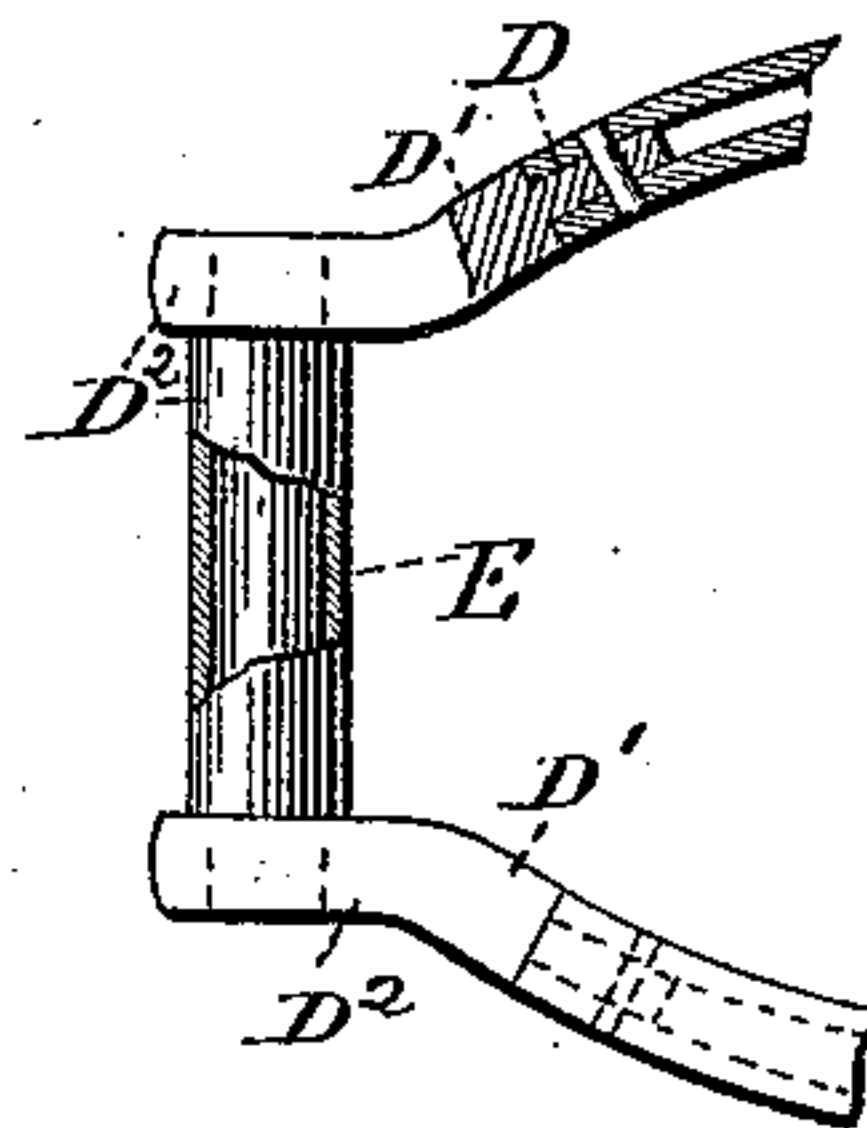


Fig. 4

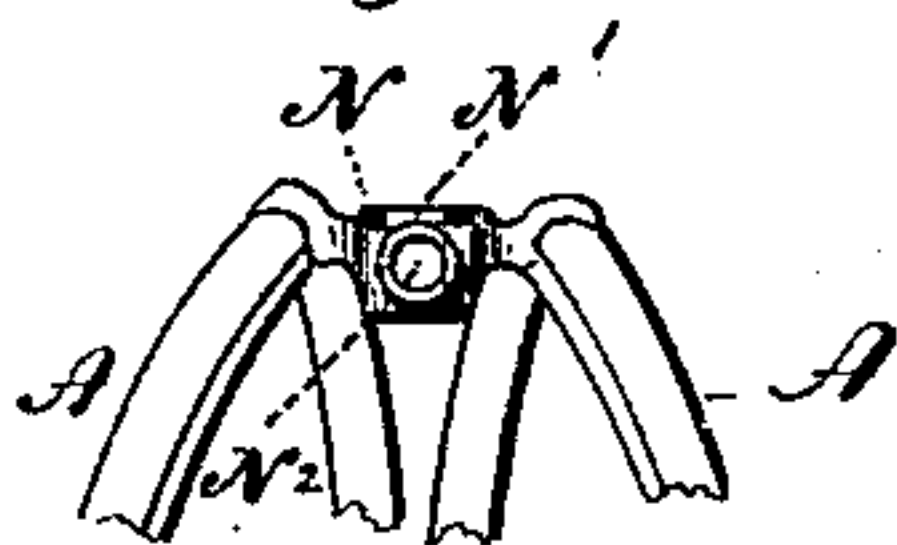
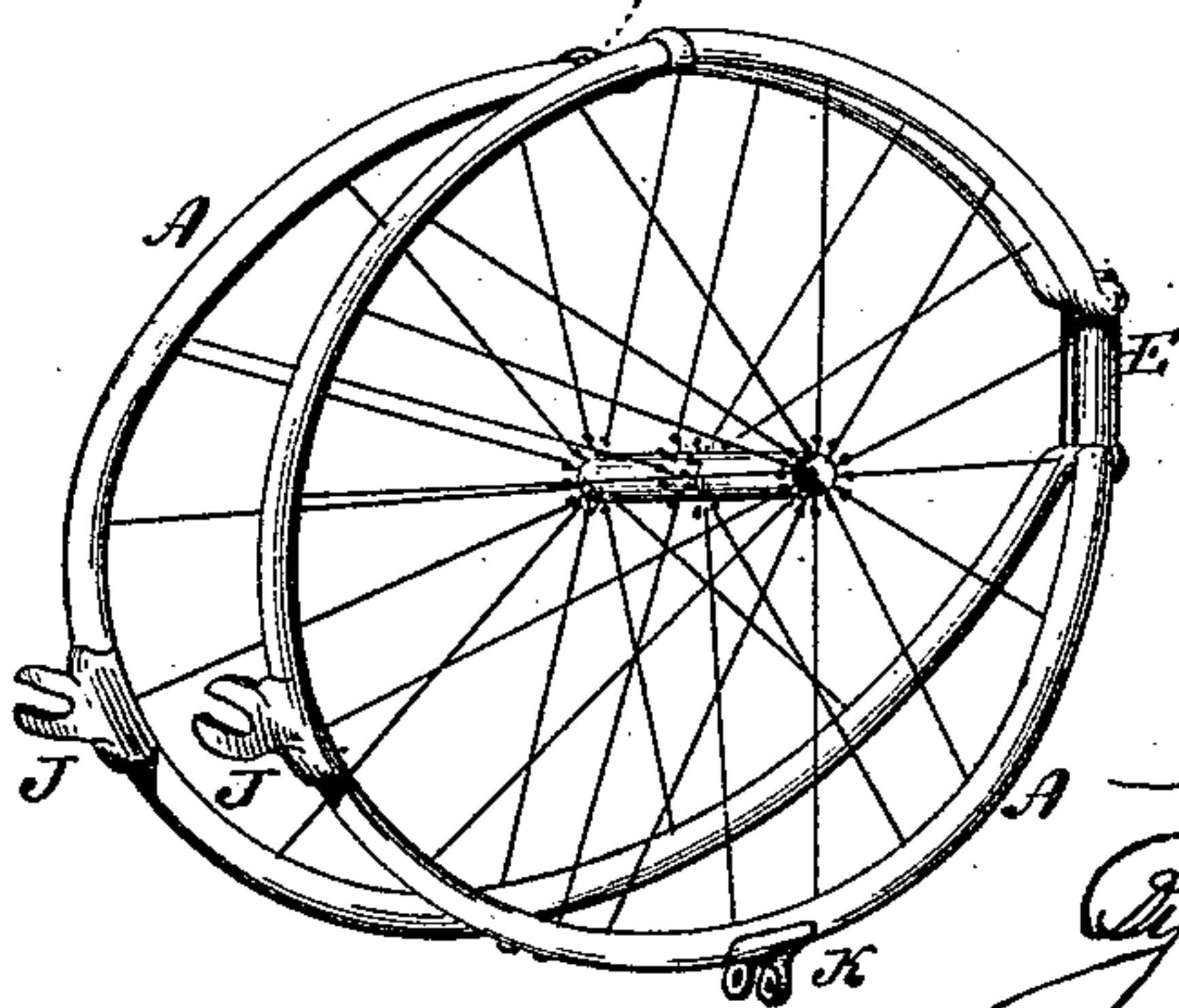


Fig. 2



Witnesses.

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UNITED STATES PATENT OFFICE.

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VELOCIPEDÉ.

SPECIFICATION forming part of Letters Patent No. 447,099, dated February 24, 1891.

Application filed December 15, 1890. Serial No. 374,721. (No model.) Patented in England May 8, 1889, No. 7,734.

To all whom it may concern:

Be it known that we, FRANK ARCHER, of London, county of Middlesex, England, and ARTHUR SYDNEY BOWLEY, of Balham Grove, in the county of Surrey, England, have invented new Improvements in Velocipedes, (and which have been patented in Great Britain May 8, 1889, No. 7,734;) and we do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a view in side elevation of a Safety bicycle provided with a frame constructed in accordance with our invention; Fig. 2, a detached perspective view of the frame, taken from its rear end; Fig. 3, an enlarged broken view, partly in side elevation and partly in section, showing the extreme forward end of the frame; Fig. 4, a broken view in rear elevation, showing the bridge which unites the upper edges of the two members of the frame and provides for the support of the saddle; Fig. 5, a detached plan view of one of the solid heads provided for connecting the forward ends of the two members of the frame; Fig. 6, a view in side elevation of a Safety bicycle, showing another form which our improved frame may assume.

Our invention relates to an improvement in frames for velocipedes, the object being to produce a frame which shall be lighter, stiffer, more durable, and less subject to vibration than any frame as yet produced so far as known to us.

With these ends in view our invention consists in a velocipede-frame having one or more light rims stiffened by tensional devices applied to them on the suspension principle, and in certain details of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

As shown by Figs. 1, 2, 3, and 4 of the drawings, our improved frame is composed of two tubular elliptical rims A A, stiffened on the suspension principle by means of spokes B, connected to their inner edges and to a hub

C, common to them both, and adapted to be drawn to the required tension in any suitable manner. The forward ends of the said rims are converged, sleeved over, pinned, and brazed to plugs or dowels D, formed at the outer ends of the two diverging arms D D' of two forged heads D² D², respectively attached to the ends of a tube E, through which the steering-rod F passes, the said rod being provided at its upper end with a transverse handle-bar G, and at its lower end with a fork H, in which the steering-wheel H' is mounted. The rear portions of the rims are diverged to permit the rear wheel I to enter and run between them, the axle J' of the said wheel being mounted in bearings J J, secured to their rear edges. Bearings K K, located at their lower edges, are provided to receive the crank-shaft L, carrying the crank-shafts L'.

As shown by Fig. 1 of the drawings, the saddle M is supported upon two supporting and, if desired, spring arms M' M', connected with the rims at separated points thereupon, so as to diffuse the strain imposed upon the frame by the weight of the rider instead of concentrating it at one point; but, as shown by Figs. 2 and 4 of the drawings, a bridge or strap N is provided for the attachment of the saddle, and thereto provided with a vertical or nearly vertical opening N' to receive the ordinary L-shaped saddle-post, (not shown,) and with a horizontal opening N² to receive a binding-screw (not shown) for holding the said post in place. If preferred, the rims A A may be complete ellipses and clamped in any convenient manner to the steering-head instead of having portions of their forward ends virtually elided, as shown herein.

As shown by Fig. 6 of the drawings, the frame is composed of two annular rims O O, stiffened by stays P, joining the rims at opposite points therein and arranged in pairs and on the suspension principle. If desired, however, these stays may be replaced by stays otherwise arranged or by a hub and spokes. In order to secure the required distance between the wheels of the vehicles without making the rims so large as to be cumbersome and unsightly, we apply converging rods P P to

their forward edges and attach the same at their forward ends to a spindle Q, mounted in heads Q' Q', through which the steering-rod passes. Otherwise than above the frame shown by Fig. 6 is essentially like the frame previously described.

It will readily be understood that by constructing a velocipede-frame on the suspension principle we can secure a structure of great stiffness by the use of very light stock, in the same manner that velocipede-wheels can be made very light and yet very rigid. Among other advantages proceeding from our construction ease of propulsion and economy of power may be mentioned. These results are secured because all of the energy used by the rider is directly applied to propelling the vehicle, none of it being diverted and wasted in springing the frame from side to side, as occurs with many machines as now constructed. Furthermore, although the frame is very rigid, there is an absence of that hardness so objectionable in velocipede-frames of ordinary construction, inasmuch as the vibration to which the machine is subjected by the shocks of travel is so diffused throughout the several spokes or tensional appliances of the frame that it is not communicated to the rider with that force or jarring effect common to frames composed of two or three main pieces of tubing, which transmit vibration directly to him, greatly to his discomfort and racking the machine. Again, in making frames in accordance with our invention we are enabled to use a very superior quality of material, whereby they may be made very durable; and, moreover, from the nature of our improved frame it is almost impossible to put a breaking strain upon it when it is in a vertical position.

Although our improved frame is especially adapted for use in the construction of Safety bicycles, it is not limited thereto, but with appropriate modifications may be employed in other forms of cycles; nor are we limited to rims of any particular shape or cross-section, so long as they are adapted in form and material to be stiffened by spokes, stays, or other tensional devices applied on the suspension principle. For instance, they may be oval instead of elliptical or annular, and crescential instead of round in cross-section, or they may be made simply of flat ribbons or strips. Instead, also, of being made of two independent rims, one rim adapted to be split or to divide at its rear end to form a fork for the rear wheel may be employed, or two independent rims might be attached to the opposite ends of the axle of the rear wheel and converged to the steering-head of the vehicle and united by transverse braces or straps, or not, as desired. Portions of the frame subjected to unusual strain may be re-enforced by additions of metal or by stays applied, after the principle of chords. We would therefore have it understood that we do not limit our-

selves to the exact constructions herein shown and described or to the use of our improved frames with Safety bicycles, but hold ourselves at liberty to make such changes and alterations as fairly fall within the spirit and scope of our invention.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a velocipede, a main frame consisting of a rim and tensional devices or stays connected therewith on the suspension principle, substantially as described.

2. In a velocipede, a main frame consisting of a rim, a central hub, and spokes radiating from the hub to the rim to stiffen the same, substantially as described.

3. In a velocipede, a main frame consisting of two rims converging at their forward ends and spread apart at their rear ends to admit a wheel between them, and tensional devices connected with the said rims on the suspension principle, substantially as described.

4. In a velocipede, a main frame comprising two rims converging at their forward ends and spread apart at their rear ends to admit a wheel between them, a hub common to both rims, and spokes radiating from the said hub to both rims for stiffening them, substantially as described.

5. In a velocipede, a main frame comprising two elliptical rims converging at their forward ends and joined to a tube and spread apart at their rear ends to receive a wheel between them, tensional devices connected with them on the suspension principle, and means for attaching a saddle, a rear wheel-axle, and a crank-shaft to them, substantially as described.

6. In a velocipede, a main frame comprising two elliptical rims converging at their forward ends and spread apart at their rear ends, tensional devices or stays applied to them on the suspension principle, and transverse straps or bridges joining them, substantially as described.

7. A velocipede-frame having two bowed rims converging at their forward ends for attachment to the steering-head and diverging at their rear ends to receive the wheel between them, and stays for bracing the said rims, the ends of which are separated vertically where they join the steering-head, substantially as described.

In testimony that we claim the foregoing as our invention, we have signed our names in presence of two subscribing witnesses.

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