(No Model.) 3 Sheets—Sheet 1.

C. M. LINLEY & J. BIGGS.

VELOCIPEDE.

No. 354,642. Patented Dec. 21, 1886.

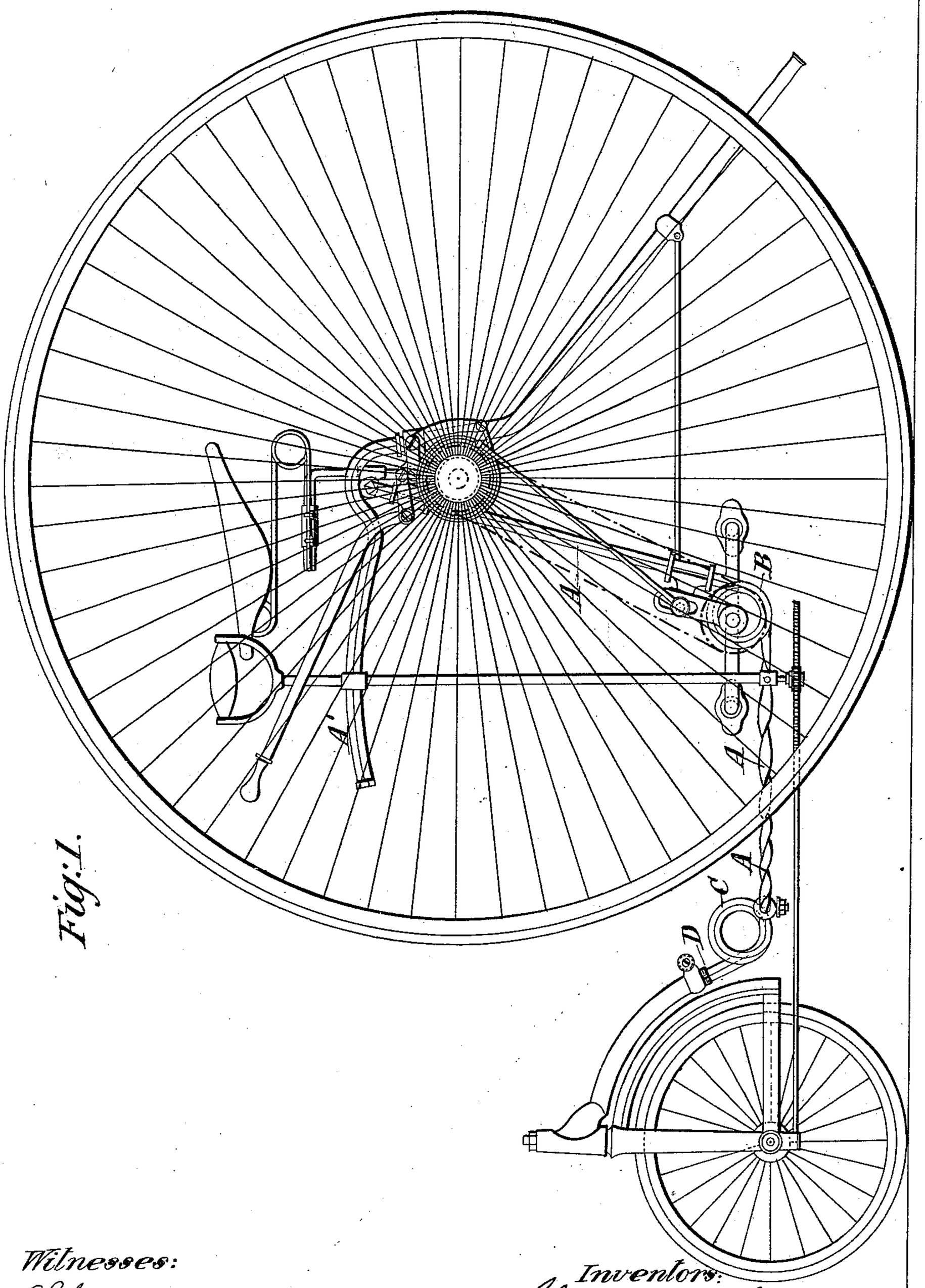

Fig. 1.

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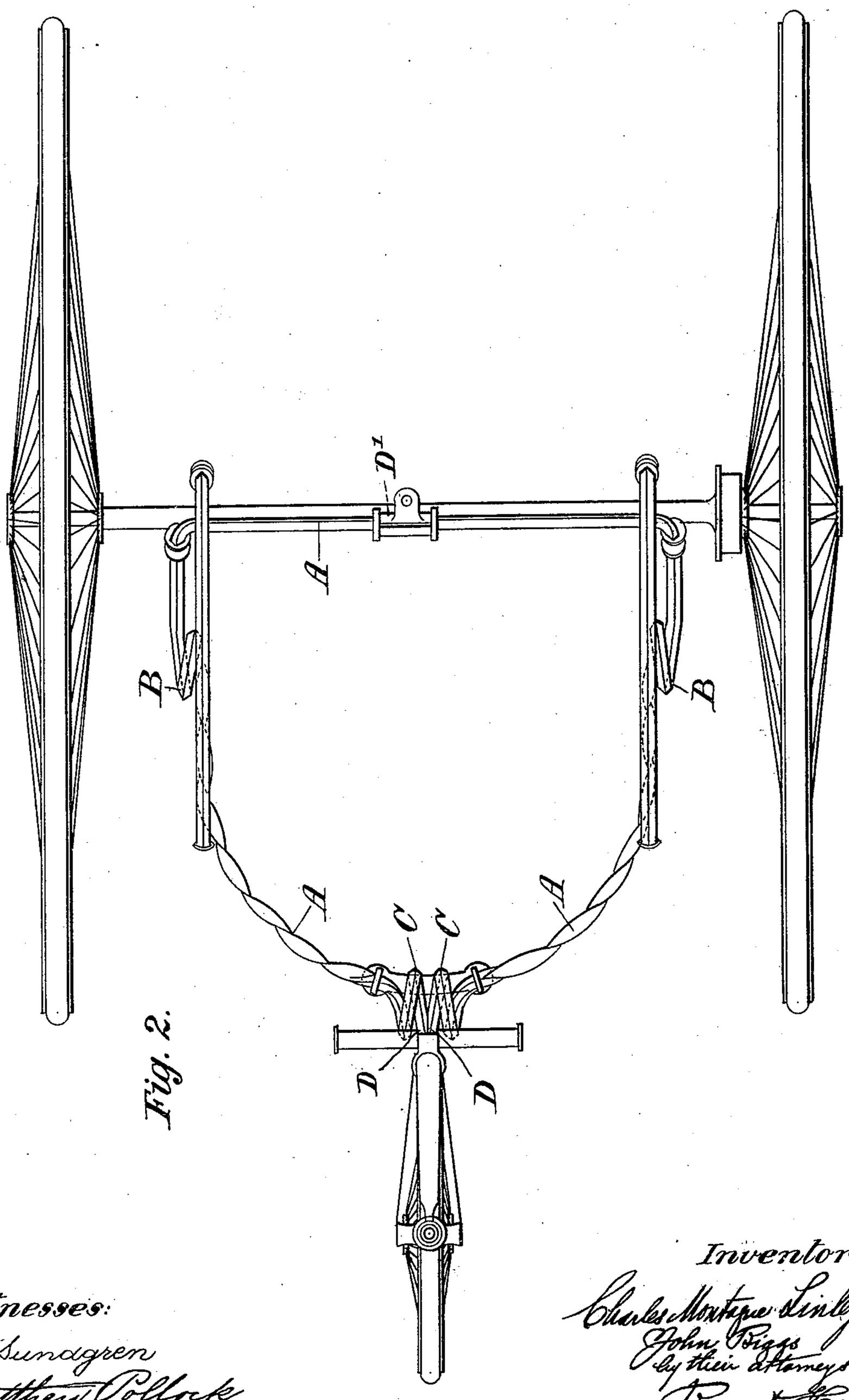

Fig. 2.

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VELOCIPEDE.

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Fig. 5.

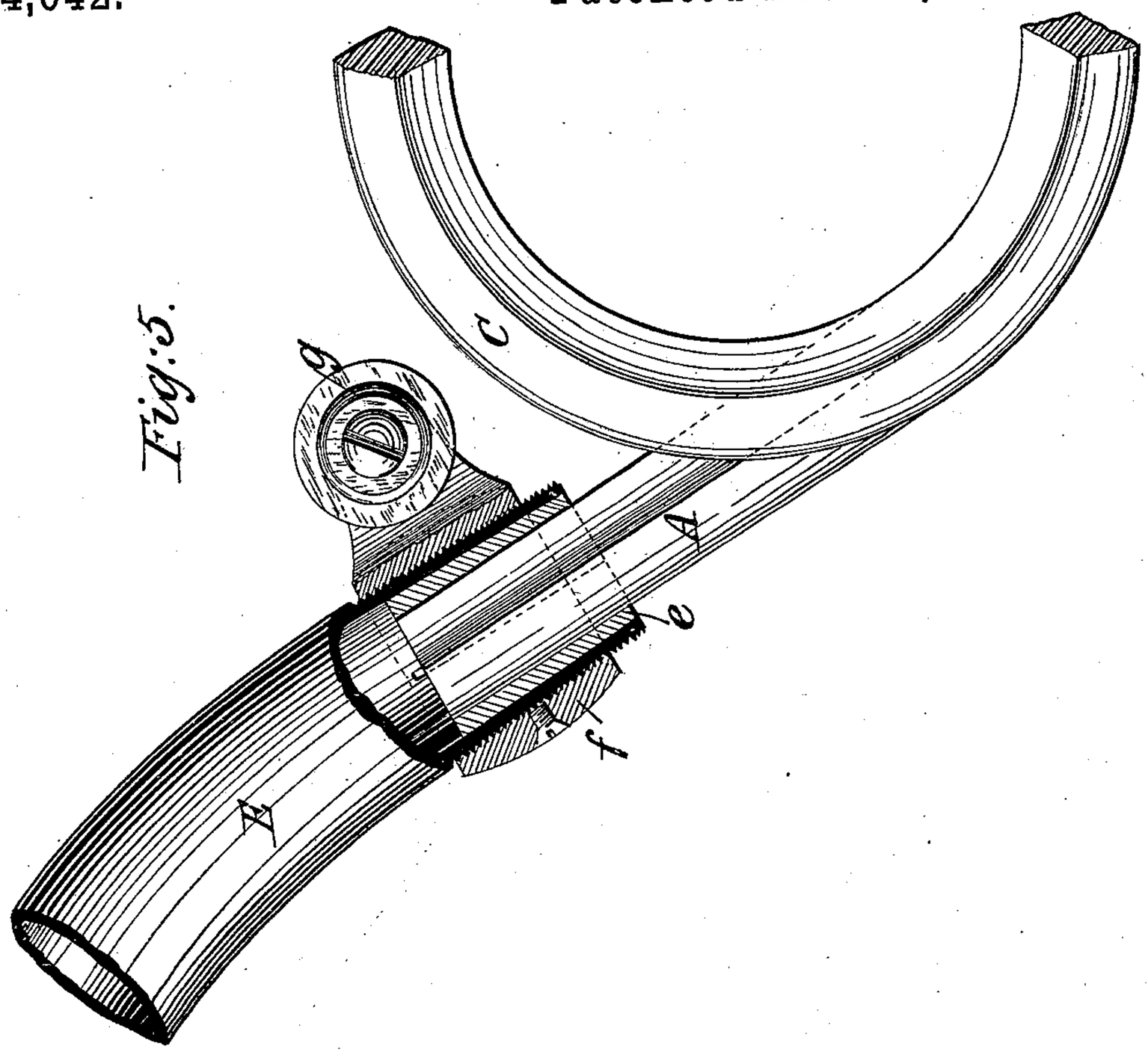


Fig. 3.

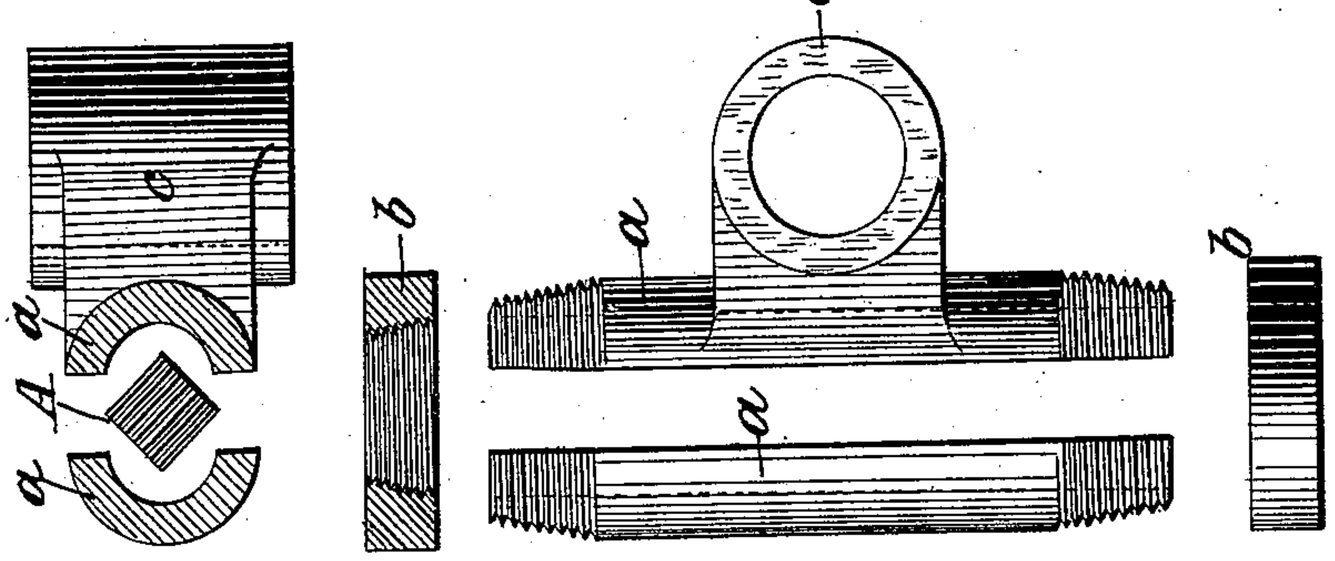
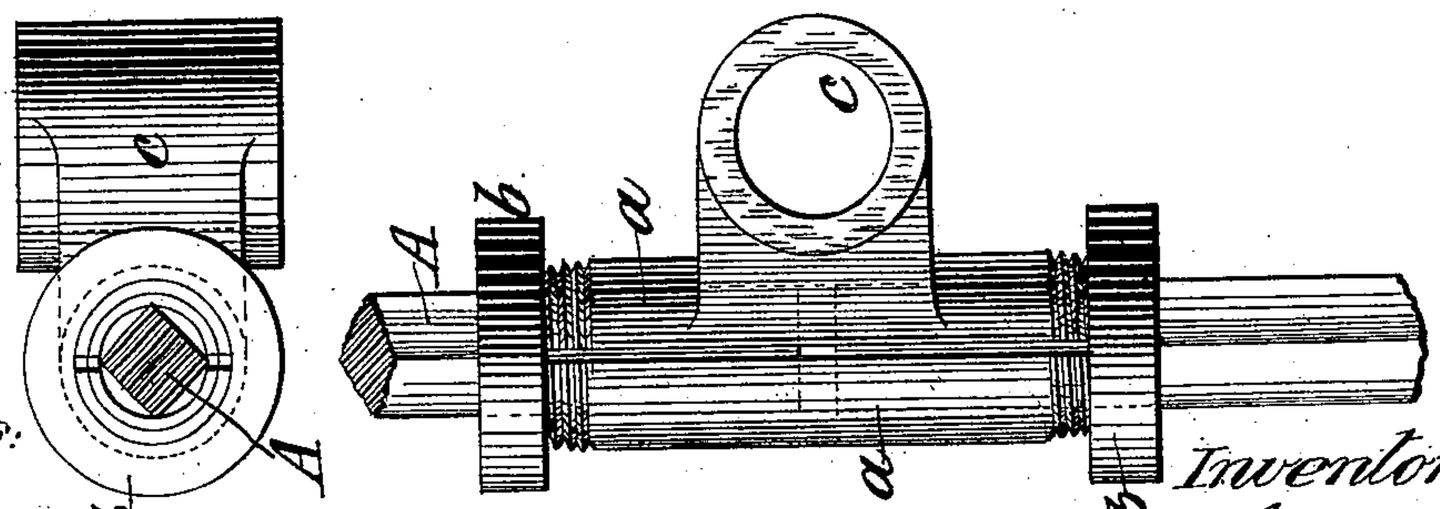


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES MONTAGUE LINLEY AND JOHN BIGGS, OF SOUTHWARK, COUNTY OF SURREY, ENGLAND, ASSIGNORS OF ONE-HALF TO GEORGE GRAINGER TANDY, OF CEDARS ROAD, CLAPHAM, COUNTY OF SURREY, ENGLAND.

VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 354,642, dated December 21, 1886.

Application filed February 26, 1885. Serial No. 157,059. (No model.) Patented in England May 13, 1884, No. 7,670; in France November 10, 1884, No. 165,280, and in Germany November 30, 1884, No. 32,784.

To all whom it may concern:

Be it known that we, CHARLES MONTAGUE LINLEY and JOHN BIGGS, both of 9 Melior Street, Southwark, in the county of Surrey, England, have invented certain new and useful Improvements in Velocipedes, of which the following is a specification.

The object of this invention is a novel construction of frame for that class of velocipedes called "tricycles," whereby the vibration which causes so much inconvenience in the ordinary frame will be neutralized.

In the accompanying drawings, Figure 1 is a side elevation of a tricycle constructed according to our invention. Fig. 2 is a plan view of the frame. Figs. 3 show in side elevation the two pieces forming the clip separated, and also the nuts with taper-threaded holes for securing them together. Figs. 4 show in similar views the same parts coupled up. Fig. 5 shows in side elevation, partly in section, the mode of attaching the steering-wheel bow to the frame of the vehicle.

We would here remark that the form of frame shown in the drawings is what is known as the "loop" frame, and the invention will be described with reference to such frame, although we by no means intend to confine ourselves to this class of frame. The crank-axle is mounted in adjustable bearings of the ordinary type. The steering-gear is of the usual character, and the brake is a band-brake of any convenient construction, none of which need any further description.

In carrying out our invention we form the frame A of rectangular bar-steel, preferably square in cross-section, set on edge—that is to say, one of its diagonals will be placed vertically, or in the direction in which the strain will be applied. At any convenient part of the frame, but preferably at the points B and C, the bar is bent cold to form coils, rings, or spirals, as shown, so that we obtain a great amount of flexibility at those points, while at the horizontal part of the frame or between the coils B and C we may twist the bar, also cold, in order to give additional rigidity or stiffness at that part. The frame is formed of two bars, the ends of which are secured at the points D D′ by clips, as hereinafter to be explained. By constructing the frame of the rectangular bar-steel set edgewise we obtain a considerable amount of flexibility generally in the frame, with additional strength and greater lightness both in appearance and actual weight than in the ordinary tubular frame of equal strength.

In vehicles of this class as at present constructed it has been considered necessary to make the frame as rigid as possible, and in order to overcome the great amount of vibration and the unpleasant jerks communicated to the rider, and occasioned, principally, by the steering-wheel coming into contact with inequalities in the road, numerous plans of mounting the saddle have been tried, but the desired object has been thereby only partially, if at all, attained. In our view, this idea is incorrect, and in order to overcome the vibration we consider the frame should be made as flexible as possible, so that in passing over rough roads the jerking of the steering-wheel shall be taken up or neutralized by the frame, say at the points C or B, and will not therefore be in any way communicated to the rider.

A′ is a curved arm, which is secured to the main frame A by clips, to be hereinafter described; and these arms serve to steady the steering-handle rod, which is adjustably connected thereto in any convenient manner, the lower end of said rod being pivoted to the frame, so as to allow of the position of the handle being changed to suit the requirements of the rider. The crank-axle is arranged to project through the coils B, the bearings being placed outside, as seen in Fig. 1.

In connecting the bearings and other parts of the vehicle to the frame we avoid all brazing, soldering, or otherwise heating the frame, whereby the temper of the steel might be destroyed, (for which reason the bending and twisting operations are carried on cold;) and we make all connections by means of clips of a special construction. These clips (shown in detached pieces at Figs. 3 and put together at Figs. 4) consist of tubular sockets *a a*, which are welded or otherwise secured to or are cast or otherwise formed with the bearings or other

parts. The ends of these sockets are tapered, and are threaded externally to receive tapered nuts *b b*. In the figures the socket *a* is shown connected to the socket *c*, for receiving the saddle-support.

The sockets *a*, when threaded, are sawed in half longitudinally, or, if desired, they may be formed in two parts, and they are then placed round the rectangular bar A, so that when the nuts are screwed up tight they will be caused firmly to grip the bar. (See Figs. 4.)

When using a steering-wheel fork, and in order to secure the ends of the elastic frame to the steering-wheel bow, which we prefer to form of tube-steel, (see Fig. 5,) we attach, by brazing or otherwise, to the tubular bow E a socket-bush, *e*, having a square or other suitably shaped hole to receive the ends of the frame A. This socket-bush *e* is tapered and threaded externally to receive a taper-nut, *f*, similar to those above described, and two or more saw cuts or slits are made longitudinally of the socket-bush *e*, so that when the taper-nut *f* is screwed on it will compress the sides of the bush against the ends of the bars, and thereby grip them. In this case we form the foot-rest *g* with the taper-nut *f*.

Having now described our invention, we wish it to be understood that we claim—

1. A frame for tricycles, constructed of rectangular bar-steel set on edge and formed into coils, rings, or spirals at various points, whereby great additional strength and flexibility are obtained, and the unpleasant vibrations and jerking caused by the running of the steering-wheel over inequalities in the ground are neutralized, as set forth.

2. The combination, with the frame, of a tubular socket, *a*, divided longitudinally into two parts the ends of which are externally taper-threaded, and nuts *b*, which are internally taper-threaded to fit the externally-taper threads of the ends of the socket, the said sockets and nuts constituting clips, which are made to grip the frame by the screwing up of the nuts.

3. The means for connecting the rectangular bar-frame to the tubular steering-wheel bow, and consisting of an externally taper-threaded socket-bush, *e*, which is brazed or otherwise suitably secured to the end of the steering-wheel bow, and provided with longitudinal saw cuts or slits, and an internally-taper nut, *f*, which when screwed up will compress the slit portion of the bush *e* and cause it to firmly grip the ends of the bars A, substantially as herein shown and described.

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