

No. 640,113.

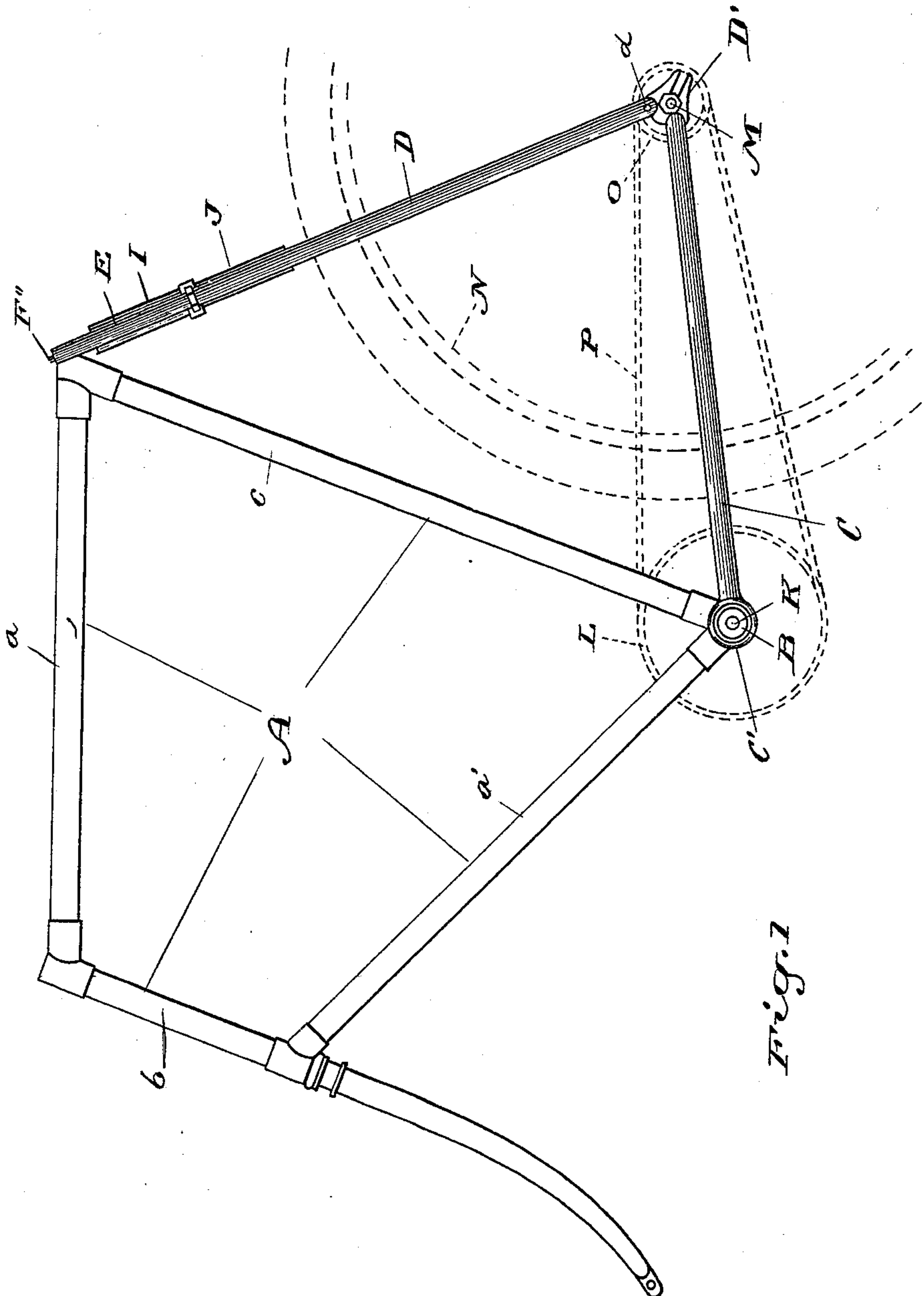
Patented Dec. 26, 1899.

H. DIXON.
BICYCLE FRAME.

(Application filed Jan. 21, 1898.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

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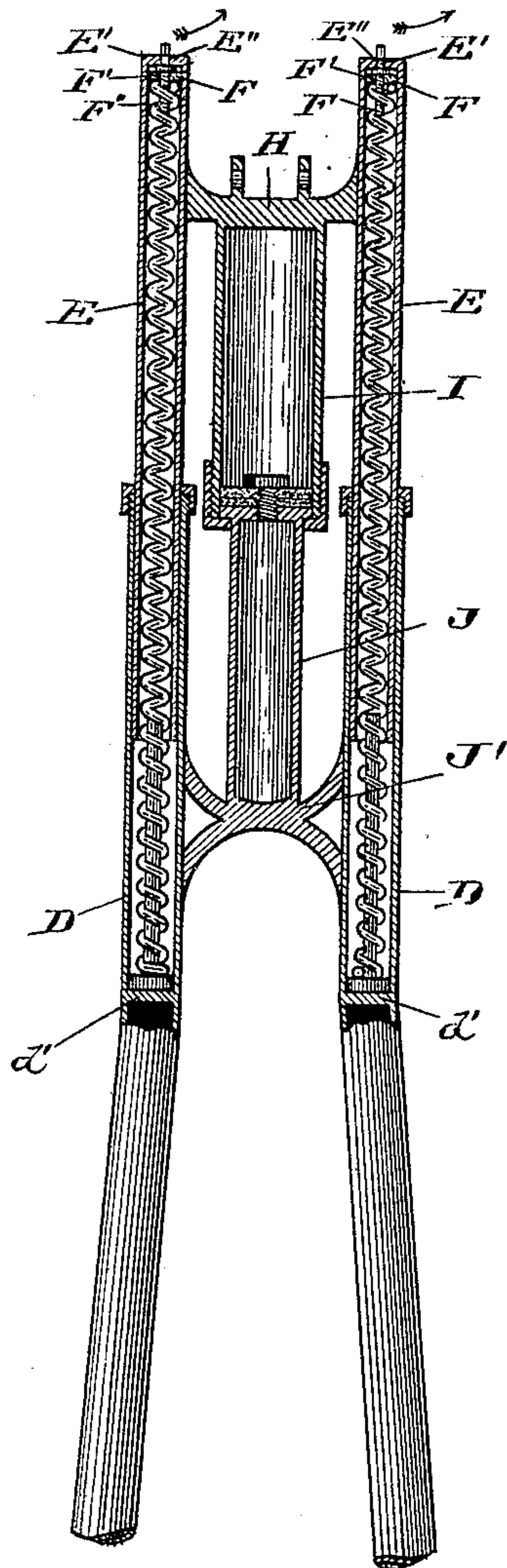


Fig. 2

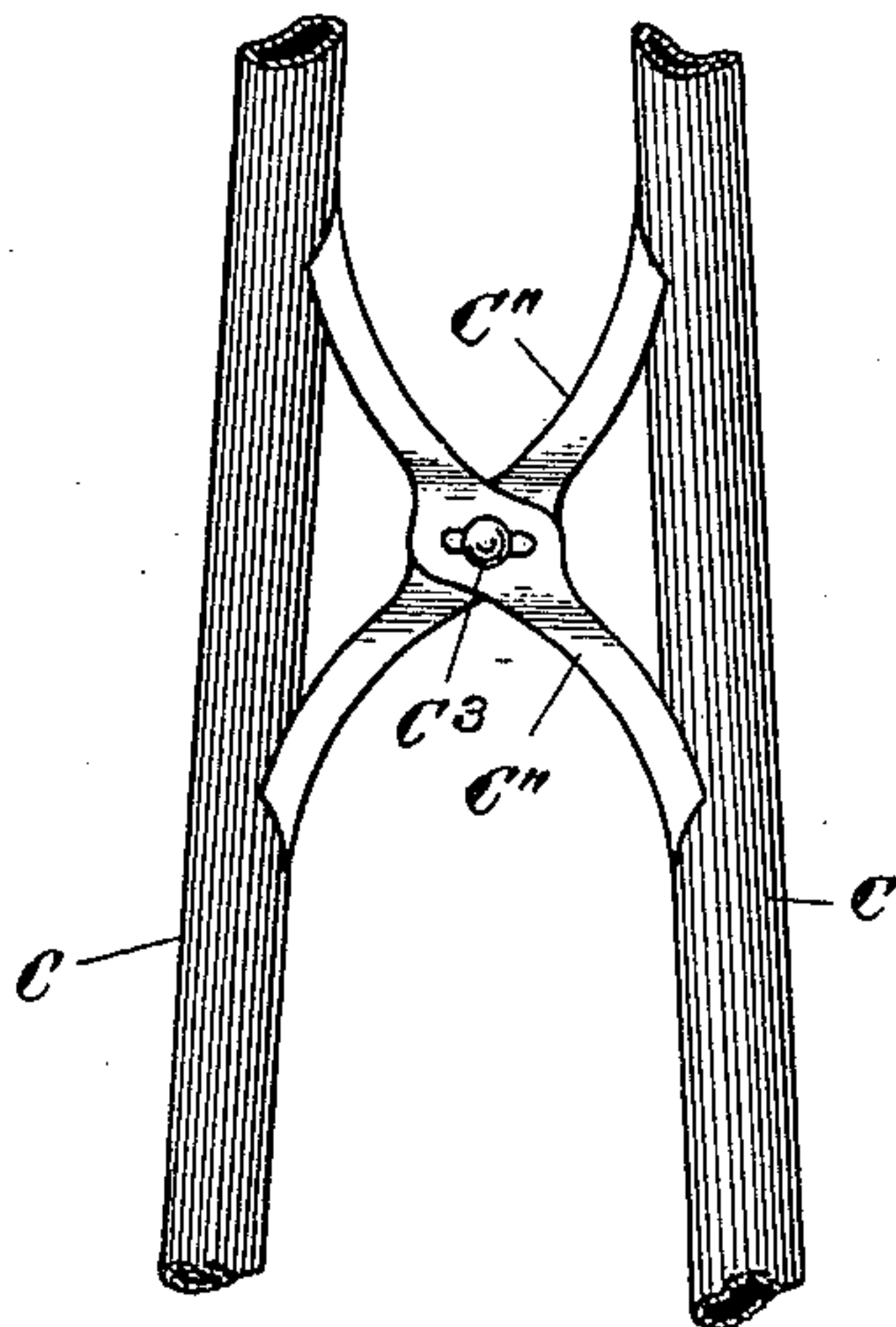


Fig. 4

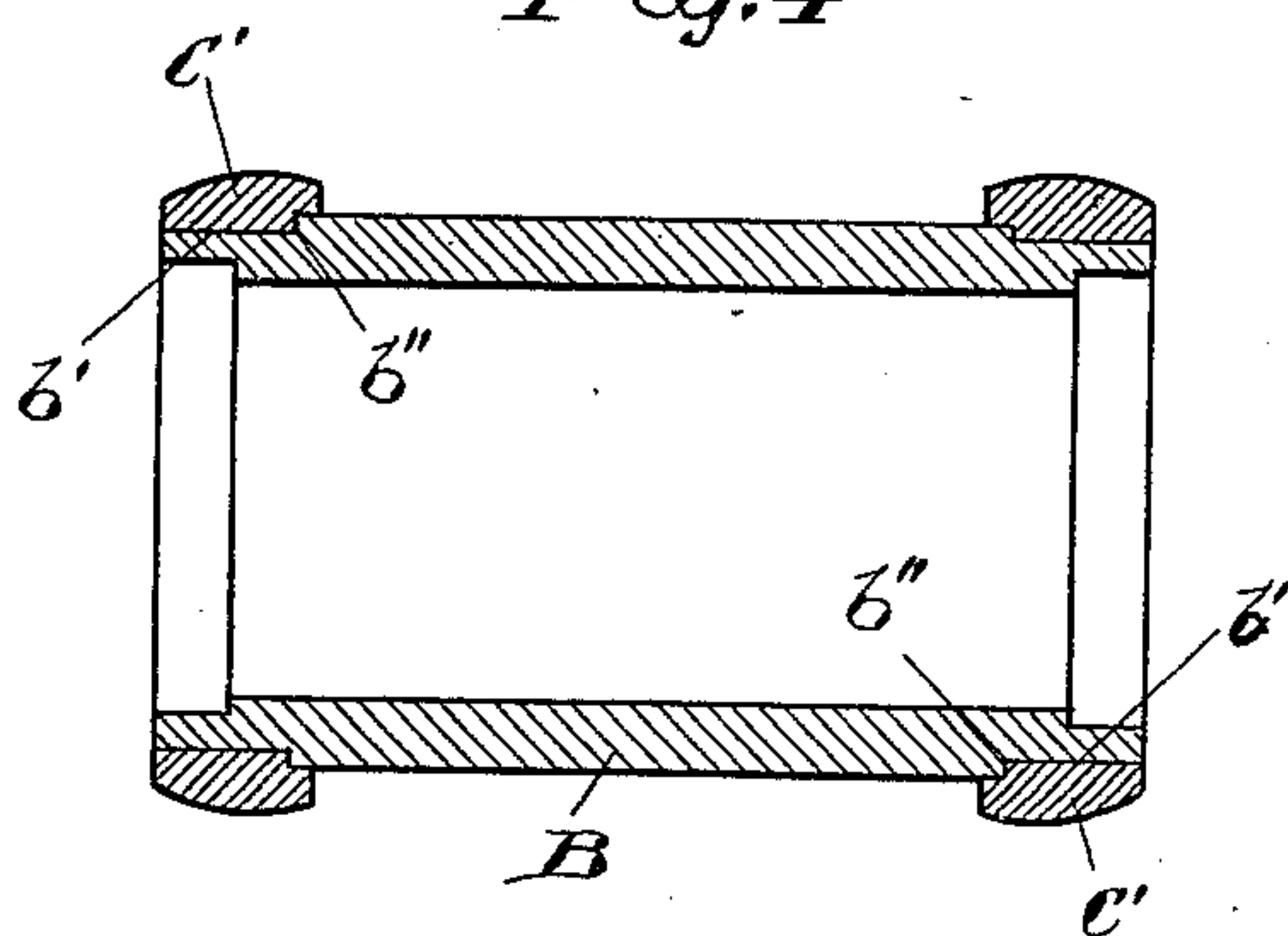


Fig. 3

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UNITED STATES PATENT OFFICE.

HENRY DIXON, OF COLLINGWOOD, CANADA.

BICYCLE-FRAME.

SPECIFICATION forming part of Letters Patent No. 640,113, dated December 26, 1899.

Application filed January 21, 1898. Serial No. 667,505. (No model.)

To all whom it may concern:

Be it known that I, HENRY DIXON, of Collingwood, in the county of Simcoe and Province of Ontario, Canada, have invented certain new and useful Improvements in the Frames of Bicycles and other Foot-Propelled Vehicles; and I hereby declare that the following is a full, clear, and exact description of the same.

10 This invention relates to certain new and useful improvements in the frames of foot-propelled vehicles, and relates more particularly to the construction of the frames of those classes of foot-propelled vehicles known as
15 "bicycles," "tandems," "quads," &c.; and the object of the invention is to so construct the frame that it, and through it the rider, will be relieved of all vibration ordinarily developed during the progress of the vehicle; and
20 the invention consists, essentially, of a frame embracing in its construction the usual upper and lower reach-bars, head, standard, and crank-axle bracket, assembled in the usual manner; the lower side bars fitted with annular bands to encircle loosely and yet snugly the
25 crank-axle bracket; the rear forks consisting of spring-controlled telescopic sections pivotally connected at their lower ends to the side bars and at their upper ends to the standard,
30 and an air-cushion interposed between the rear forks consisting of a cylinder connected to the cross-head of the standard and a plunger working within the cylinder connected to the lower telescopic sections, the whole device
35 being hereinafter more fully set forth, and more particularly pointed out in the claims.

In the drawings, Figure 1 represents a side view of a bicycle-frame. Fig. 2 represents a sectional view showing the construction of
40 the telescopic sections of the rear forks. Fig. 3 is a longitudinal section through the crank-axle bracket. Fig. 4 is a plan view of the strap connections for the side bars.

Like letters of reference refer to like parts throughout the specification and drawings.

A represents the bicycle-frame, embracing in its construction the usual upper and lower reach-bars *a a'*, respectively, head *b*, and standard *c*, assembled in the usual manner.

B represents the crank-axle bracket, connected to the lower end of the standard *c*. The crank-axle bracket B and frame A are constructed and assembled in the usual manner. Each end of the crank-hanger B is turned off or cut away to form a circumferential seat *b'*, of a lesser diameter than the body of the crank-axle bracket, and a shoulder *b''* at the inner end of each seat. Encircling each seat *b'* is a strap *C'*, which abuts against its respective shoulder *b''*.

C C represent the side bars, each of which is joined to the end of its respective strap *C'*, which securely and rotatably connects its respective side bar C to the crank-axle bracket B and allows the side bar to oscillate from the center of the crank-shaft. Connected to side bar C at the left of the frame is one end of a flat tie-piece *C''*, substantially S-shaped, which crosses diagonally to the opposite side of the frame between the driving-wheel and crank-axle bracket and is connected to the other side bar C at a point nearer the driving-wheel, while connected to the side bar C at the right of the frame is one end of a similar tie-piece *C''*, which diagonally crosses to the left side of the frame between the driving-wheel and crank-axle bracket and is connected to the other side bar. Each of the tie-pieces *C'' C''* is provided with an elongated slot, through which passes a clamping-bolt *C³* to rigidly and adjustably lock them together. This construction permits of the adjustment of the side bars and of the straps *C' C'* when fitted on the crank-axle bracket, at the same time preventing their outward displacement under ordinary conditions, the shoulders *b''* preventing their inward displacement.

D' D' represent the bifurcated brackets for the axle of the driving-wheel connected to the rear ends of the side bars C C.

D D represent the lower telescopic sections of the rear forks, the lower ends of which are pivotally connected to the brackets D' D' by a pivot-pin or bolt *d*. Each telescopic section D consists of a tube or sleeve fitted with an internal plug *d'* intermediate the top and bottom of the section.

E E represent the upper telescopic sections of the rear forks, each upper section working within its respective lower section D.

F F represent two movable nuts, one located within each of the telescopic sections E E. Each of the nuts F F is provided with a tapped hole F', through which passes a screw-threaded bolt F''. The cap E' of each of the telescopic sections E is provided with a hole E'', through which extends the shank of the bolt F''. The shank of the bolt F'' on the under side of the cap E' is provided with a collar, which prevents the bolt being thrust out of its respective telescopic section by the upward pressure of the spring. The turning of the bolt in the direction indicated by arrows causes the downward movement of the nut F, while the reverse rotation of the bolt causes the upward movement of the nut. The downward movement of the nut F compresses the spring and increases its force, while the upward movement of the nut permits of the expansion of the spring and diminishes its force. By means of the bolts and movable nuts the pressure of the springs can be controlled and regulated to the weight of the rider. The top of each of the telescopic sections E E is pivotally connected to a cross-head H, bolted or otherwise joined to the top of the standard of the frame A.

I represents an air-cylinder rigidly connected to the cross-head H intermediate the sections E E.

J represents a plunger connected to the cross-head J', which cross-head is connected to the lower telescopic sections D D above the driving-wheel. The top of the plunger J is provided with a washer, of leather, rubber, or other suitable material, which fits snugly against the inner side of the cylinder H. The forcing of the plunger into the cylinder compresses the air within it, which cushions the telescopic action of the sections D E by its resistance to the plunger.

K represents the crank-shaft journaled in the crank-axle bracket B.

L represents the sprocket-wheel mounted on the crank-shaft K.

M represents the axle of the driving-wheel, rigidly mounted in the brackets D' D' of the side bars C C.

N represents the driving-wheel revolvably mounted on the axle M.

O represents the sprocket-wheel connected to the hub of the driving-wheel, and P represents a sprocket-chain passing around the sprocket-wheels L and O.

The action of the invention is as follows: If during the progress of the wheel an obstacle is met or the wheel passes over a surface sufficiently rough or uneven to create a jolting or jarring motion, the side bars C C will oscillate with the center of the crank-shaft as their center and cause the lower telescopic sections of the rear forks to slide up on the

upper sections. This upward action of the lower sections will force the plunger into the air-cylinder and cause it to compress the air within the cylinder. The compression of the air within the cylinder causes the gradual resistance to the plunger and cushions the telescoping action of the sections D E, thus compensating the vibratory or the jolting or the jarring developed during the progress of the wheel. The oscillatory movement of the side bars C C would naturally affect the relation of the lower sections D D to the upper sections E E of the rear forks, and to enable the lower sections D D to maintain their correct alinement with the upper sections during the movement of the side bars and telescoping action of the sections it is necessary to establish a pivotal connection between the lower ends of the lower sections and the side bars C C and the upper ends of the upper sections and the standard. By having the side bars C C oscillate from the center of the crank-shaft the distance from the center of the axle of the driving-wheel to the center of the crank-shaft will be maintained when the side bars are in their normal position and when performing the oscillatory movement. This construction practically relieves the frame from all vibratory motion, and also relieves the former from the wear and weakening of the frame occasioned by such vibratory motion.

By relieving the frame of the vibratory motion the rider is correspondingly relieved and is enabled to propel his vehicle over a rough road at a higher rate of speed than that at which he could travel if the frame were rigid.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a frame for foot-propelled vehicles the combination of the crank-axle bracket, the side bars, and an oscillating connection between the crank-axle bracket and side bars, consisting of a strap for each side bar encircling loosely its respective end of the crank-axle bracket, a brace for the side bars consisting of a stay, one end of which is connected to one of the side bars and crosses diagonally to the opposite side of the frame, between the crank-axle bracket and driving-wheel and has its opposite end connected to the other side bar, a slot in each of the crossed projections, and a bolt passing through the slots and clamping the projections together, substantially as specified.

2. A bicycle embracing in its construction the upper side bars of the rear forks each consisting of two sets of telescopic members the lower telescopic members pivotally connected to the rear ends of the lower side bars the upper ends of the upper telescopic members connected to the standard of the main frame the upper telescopic members movable within the lower telescopic members a permanent stop in each of the lower telescopic

members an adjustable stop in each of the upper telescopic members a spring within each set of telescopic members pressing against the permanent and adjustable stops to hold their members in their normal positions an air-cushion consisting of a cylinder rigidly connected to the upper telescopic members a plunger rigidly connected to the lower telescopic members having a piston

working within the cylinder to cushion the telescoping action of the sections, substantially as specified.

Toronto, Canada, November 18, A. D. 1897.

H. DIXON.

In presence of—

C. H. RICHES,

M. A. WESTWOOD.