

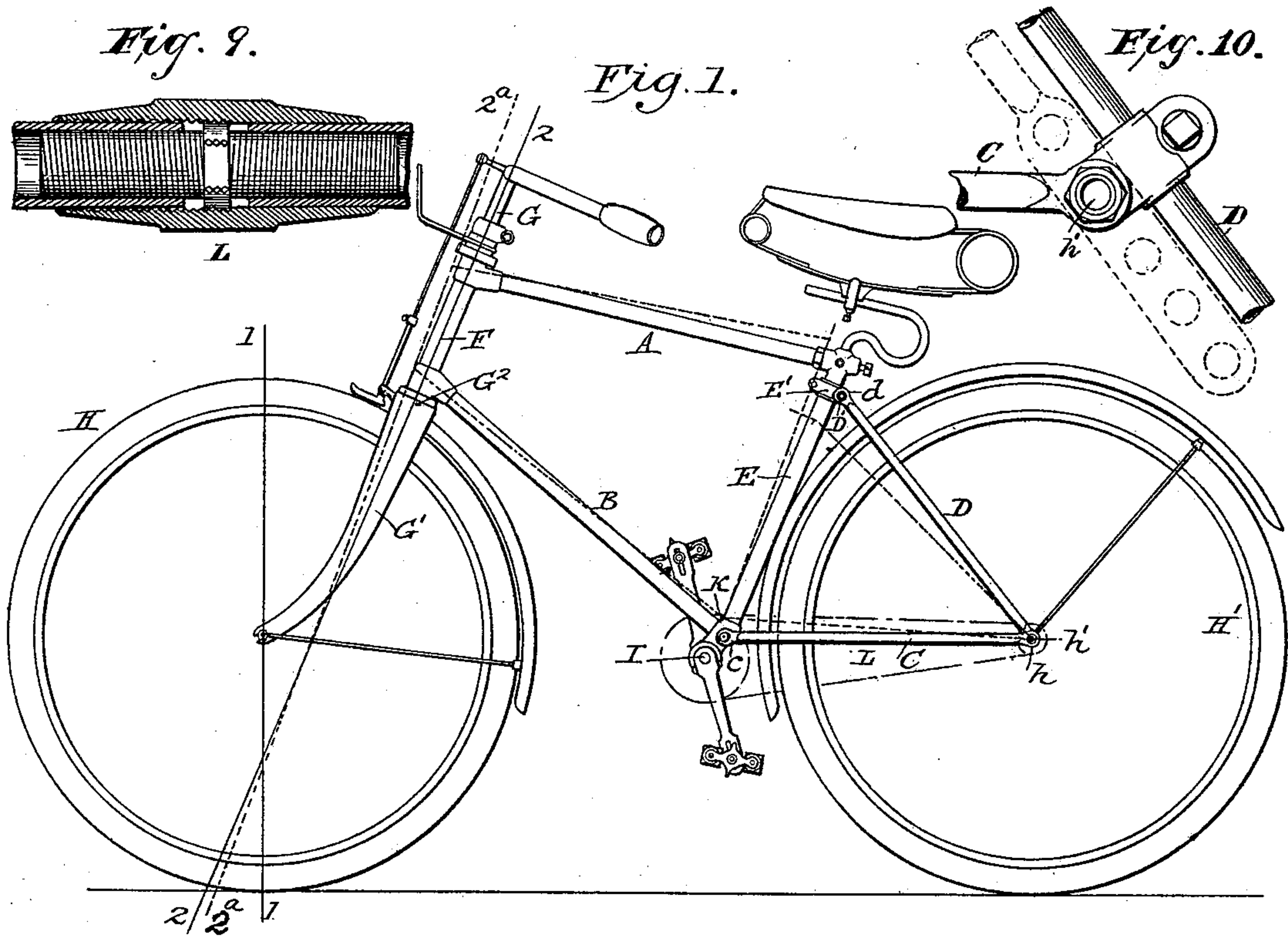
(No Model.)

2 Sheets—Sheet 1.

F. D. OWEN.
SAFETY BICYCLE.

No. 583,078.

Patented May 25. 1897.



Witnesses,
Sidney P. Hollingsworth
Chas. H. Mill

Inventor;
Frederick D. Owen
By *Edw. Keate*
his Attorney

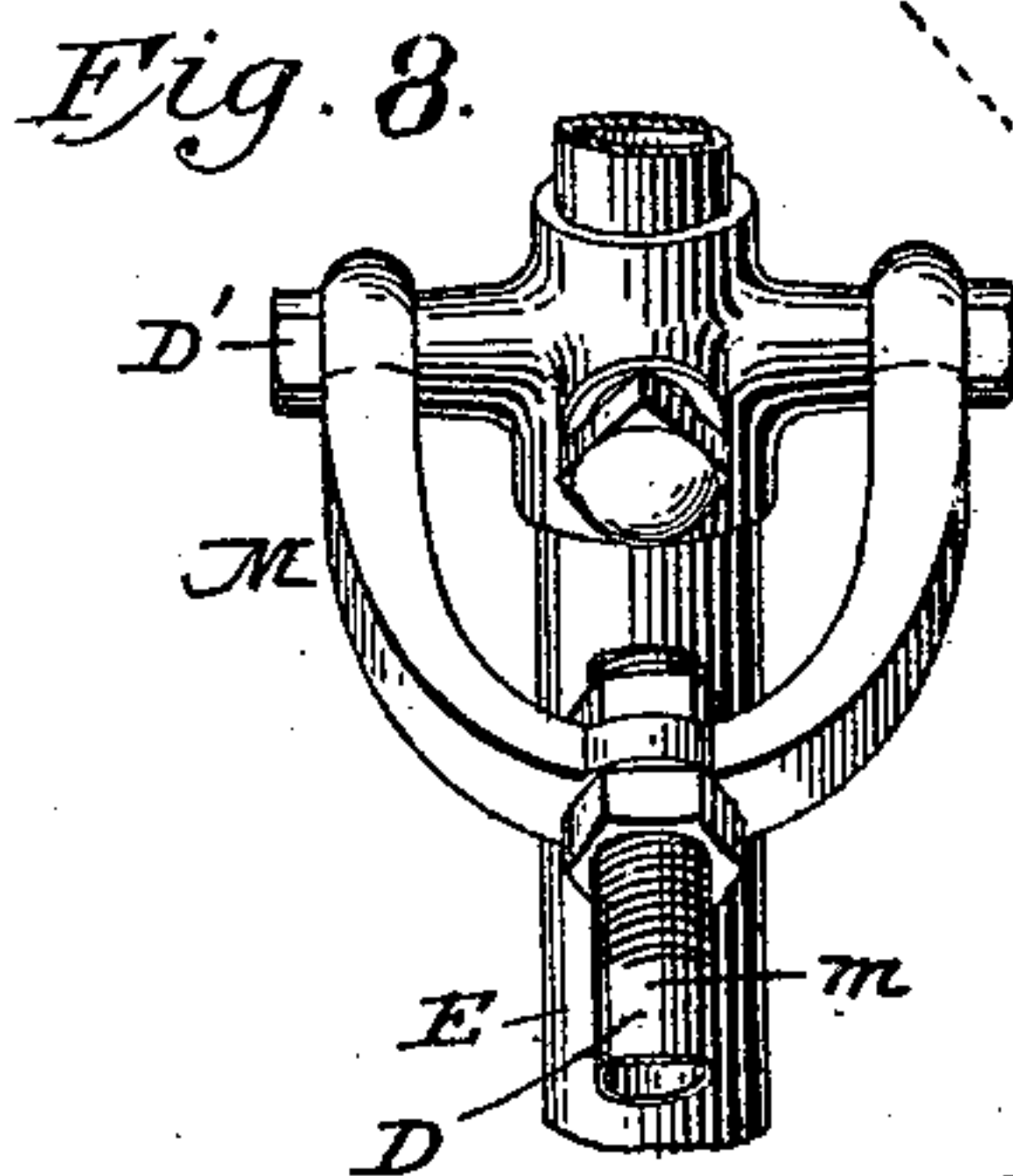
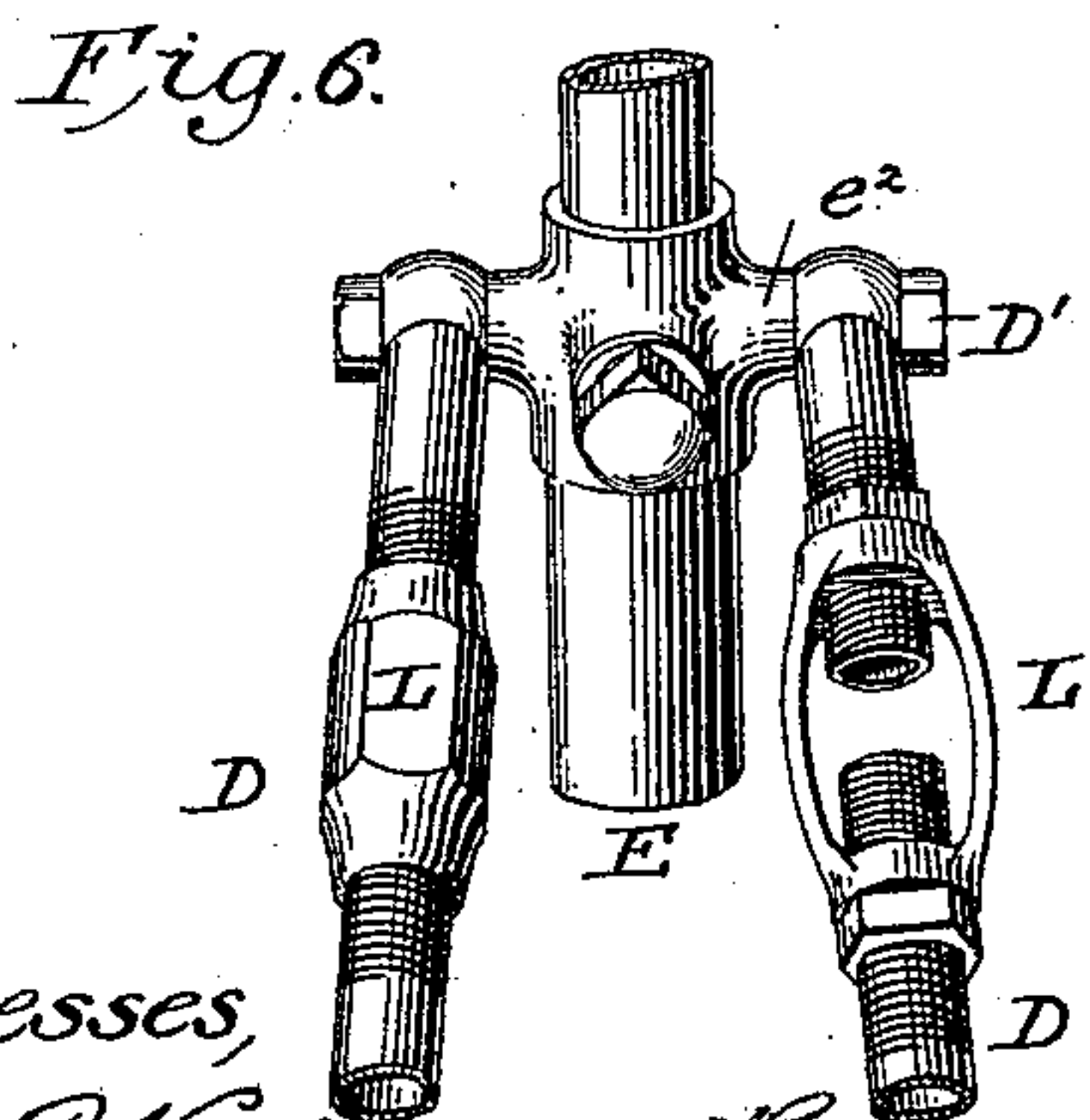
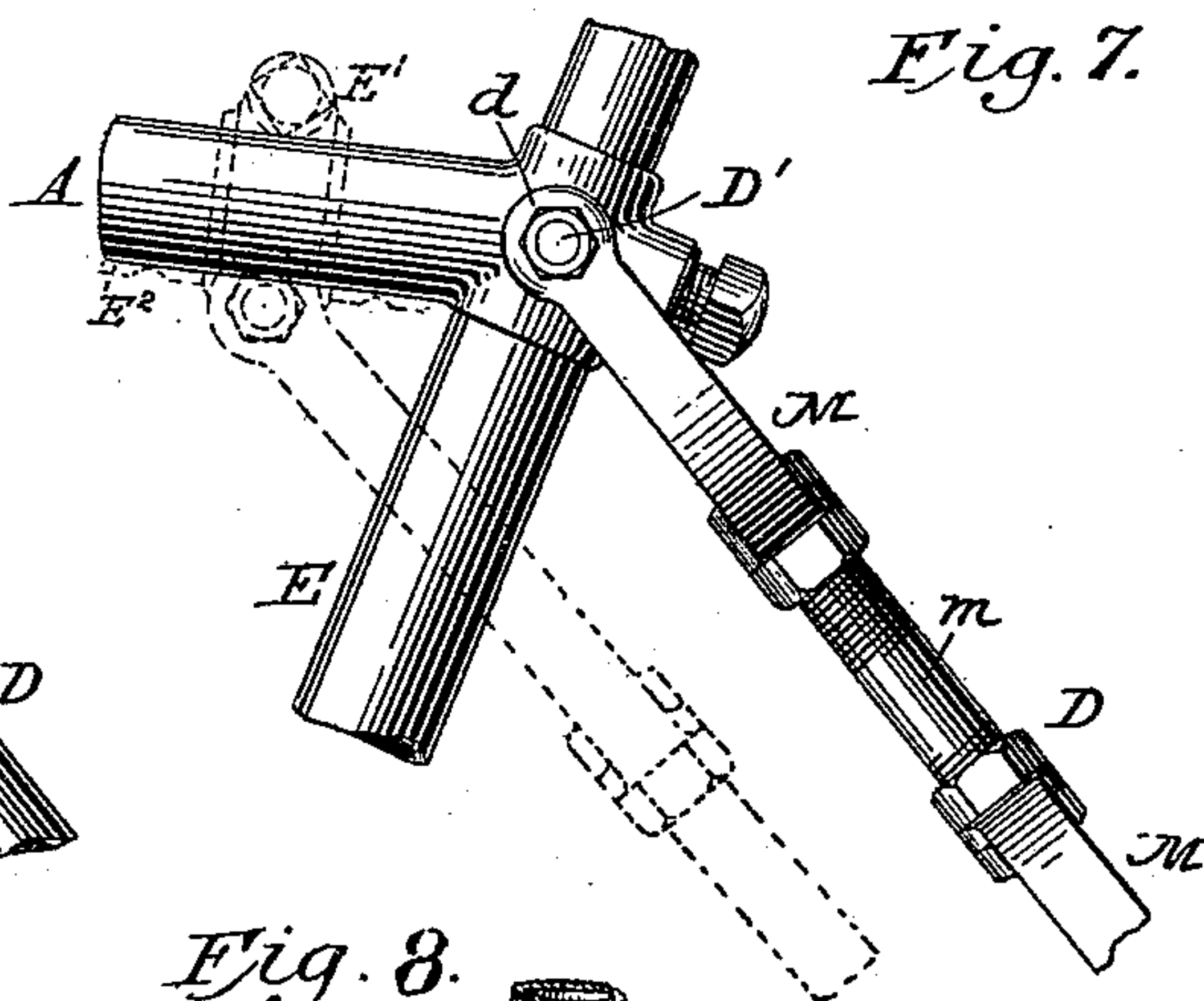
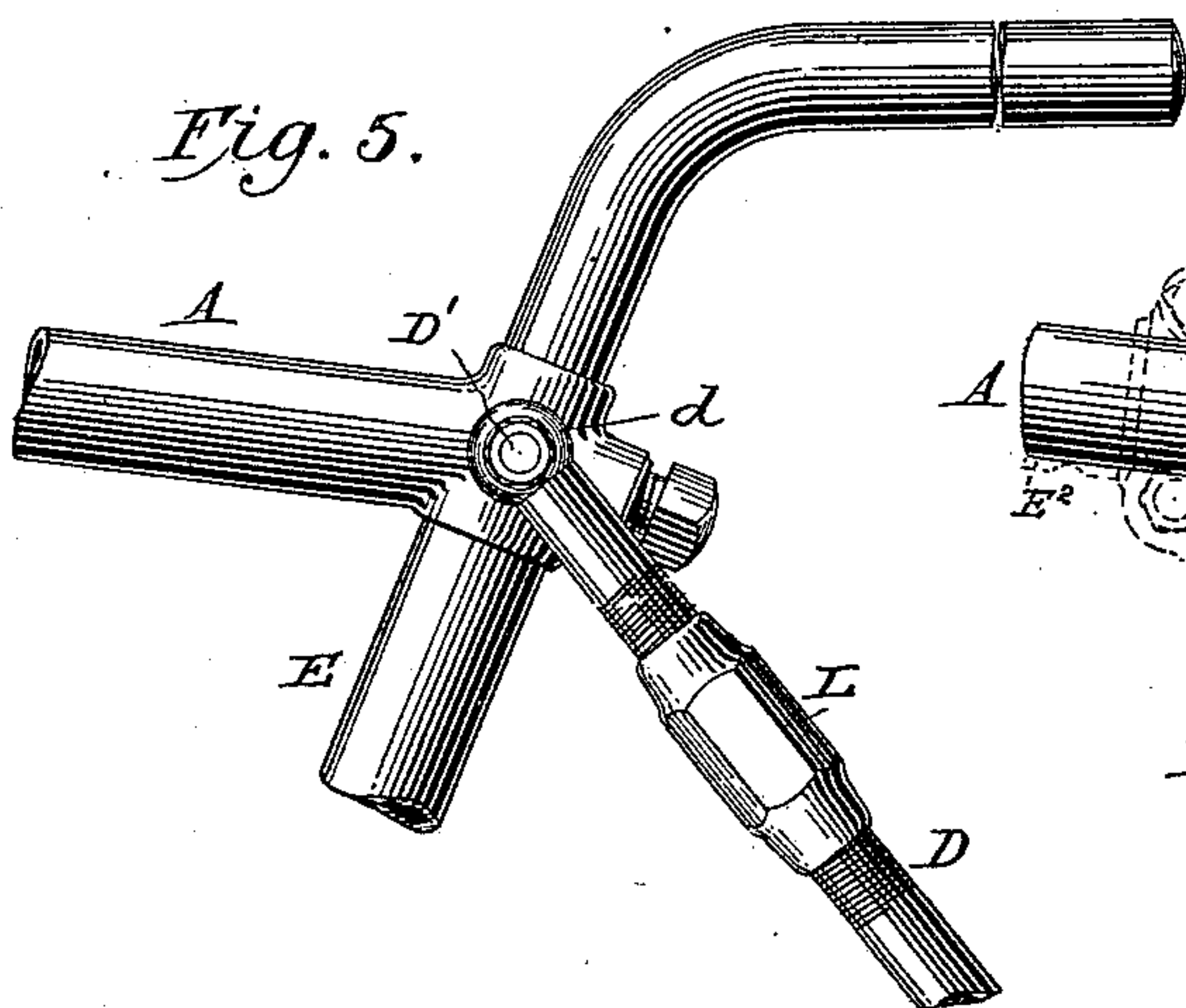
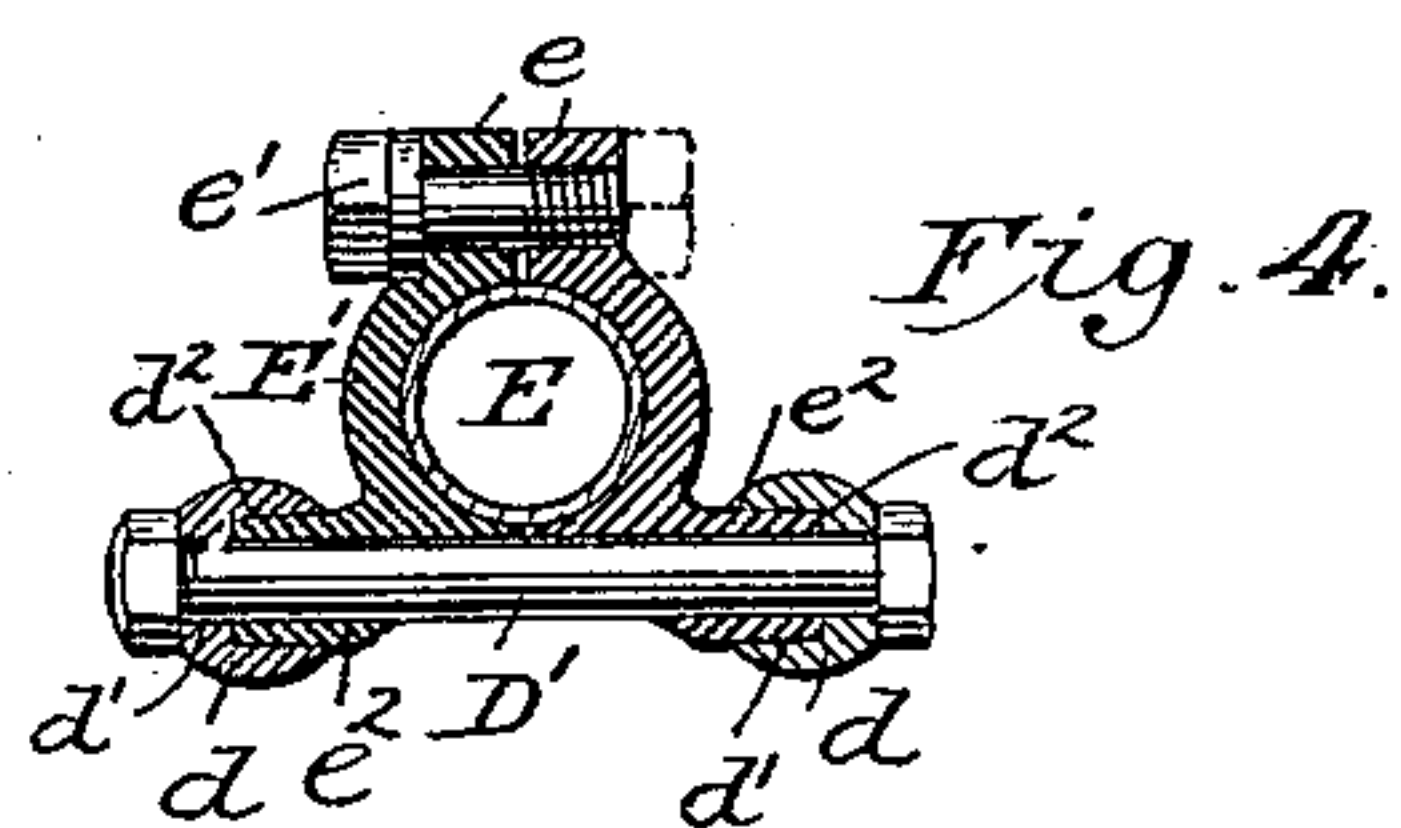
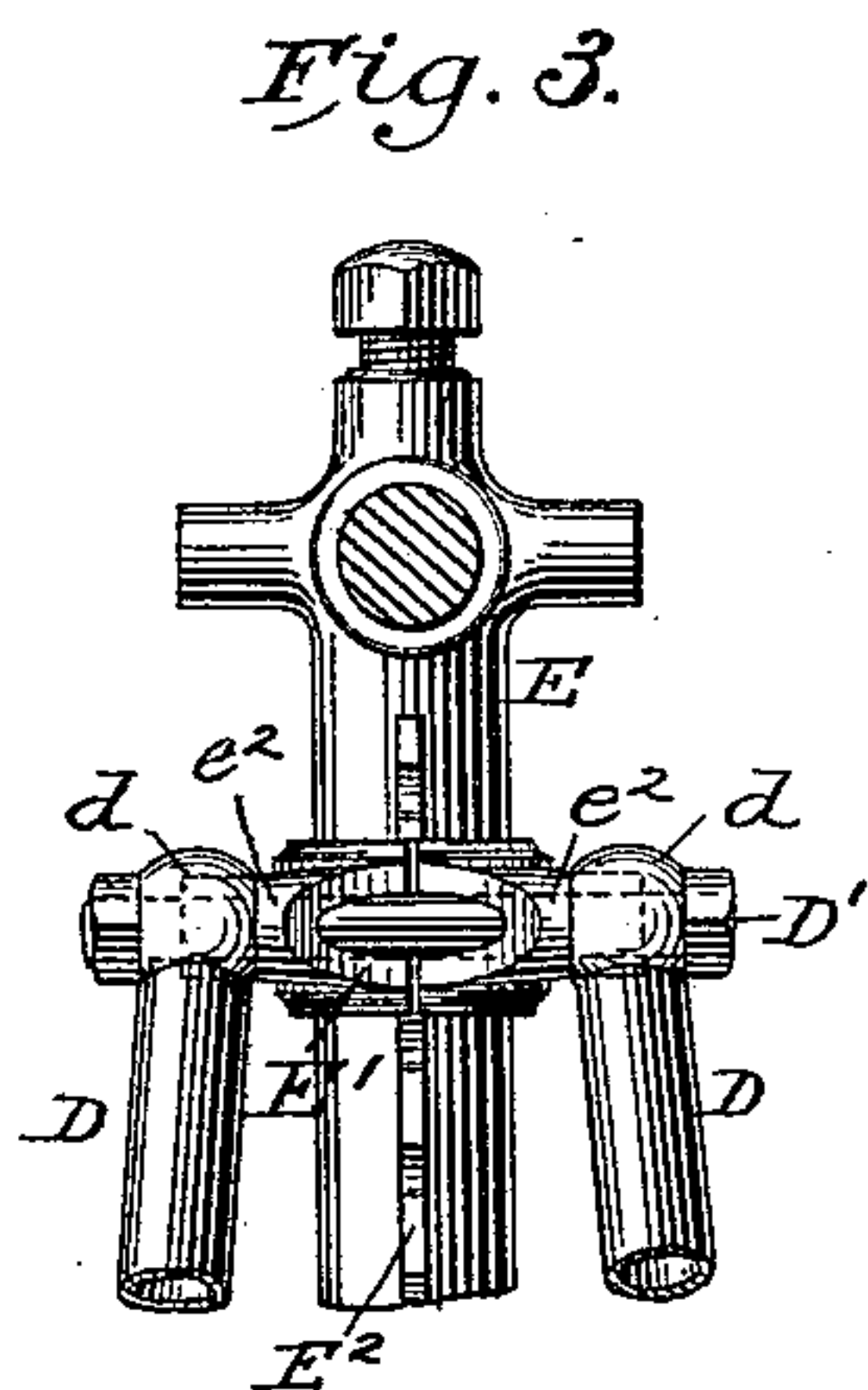
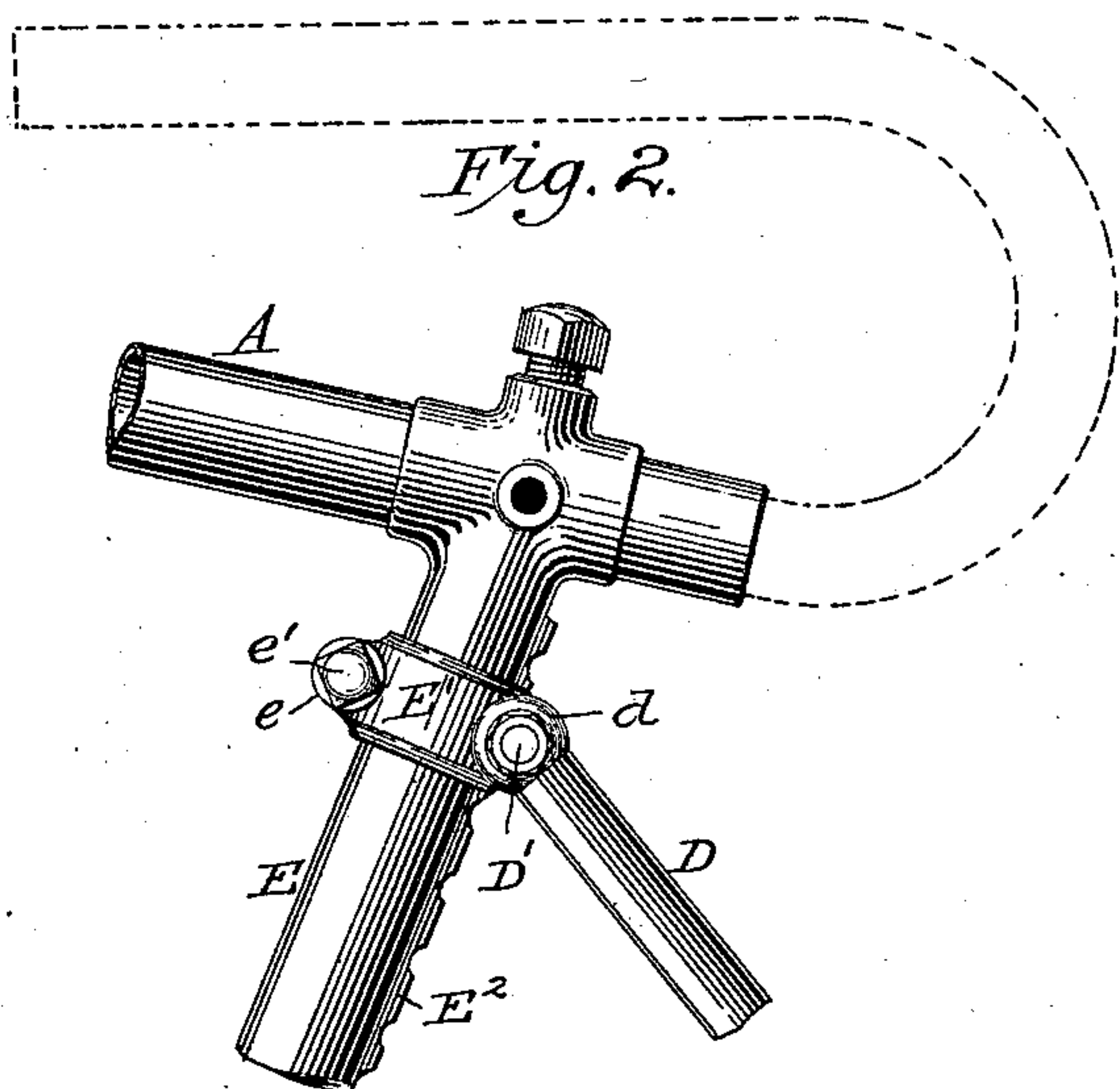
(No Model.)

2 Sheets—Sheet 2.

F. D. OWEN.
SAFETY BICYCLE.

No. 583,078.

Patented May 25, 1897.



Witnesses,
Sidney P. Hollingsworth
Chas. O'Neill

Inventor;
Frederick D. Owen
By *Ed. Keale*
his Attorney

UNITED STATES PATENT OFFICE.

FREDERICK D. OWEN, OF WASHINGTON, DISTRICT OF COLUMBIA.

SAFETY-BICYCLE.

SPECIFICATION forming part of Letters Patent No. 583,078, dated May 25, 1897.

Application filed March 15, 1893. Serial No. 466,056. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK D. OWEN, a citizen of the United States, residing at Washington, District of Columbia, have invented certain new and useful Improvements in Safety-Bicycles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to that class of velocipedes known as "safety-bicycles," embodying in their construction two wheels of small diameter connected by a frame to form a "single-track" machine. In bicycles of this class the steering-head is arranged at such an angle with relation to the vertical diameter or vertical radius of the front or steering wheel that a line drawn through the arm of the steering-centers of the head will cross the vertical diameter of the steering-wheel at some point below the wheel-axle, and generally above the rim. Thus constructed the line of the steering-centers is a greater or less distance forward of the point of contact of the steering-wheel with the ground, so that said steering-wheel will have a casting action upon forward movement of the bicycle, which tends to prevent swerving to the right or left so long as the frame of the bicycle is kept upright.

The prime object of my invention is to provide for the adjustment of the steering-head of safety-bicycles at different angles to the vertical diameter of the front or steering wheel, thus admitting of the same bicycle being used with comfort by a tall or short rider, or by riders of different weight, or to suit different positions of the saddle or the character of the surface traveled.

With experienced riders the test of the correctness of steering of a particular machine is the ease and comfort with which it may be ridden without touching the handle-bar, or "hands off," under all conditions of speed, and it is a matter of common knowledge among wheelmen that riders of equal skill cannot steer a particular machine with equal facility. This may be owing to one or more of a number of causes, such as a difference in height, bringing the center of gravity of one rider in a different horizontal plane from that of the

other, or a difference in weight, causing greater or less friction on the head-bearings, and also a greater or less bearing-surface of the tire on the ground, or differences in the position of the saddle to render it comfortable to the rider. The condition of the surface traveled over has also a direct influence upon the proper rake of the head, as experience has shown that a comparatively straight head is better adapted for smooth roads than one having much rake. It is my aim, therefore, by providing for the adjustment of rake of its steering-head to adapt a single machine to all riders and all conditions of use.

To this end my invention consists in the matters to be hereinafter described in detail, and then pointed out in the claims at the close of this specification.

In the accompanying drawings, Figure 1 is a side elevation of a safety-bicycle embodying one form of construction for carrying my invention into practical effect. Figs. 2 to 8 are detail views illustrating certain methods of adjustment embraced in my invention. Fig. 9 is a sectional detail of an adjusting-sleeve. Fig. 10 is a detail illustrating another mode of adjusting the brace-tubes of the frame.

In this specification I have assumed that the bicycle described is standing in an upright position, as when in use, and the description thereof must be made to read with this understanding.

To illustrate the principle of my invention and some of the various modes of carrying the same into effect, I have chosen the well-known Humber type of frame, comprising the upper and lower reach-tubes A and B, rear forks C, braces D, and seat-post support E. The forward ends of the reach-tubes A and B are connected to the upper and lower ends of the head sleeve or shell F, the latter inclosing the steering-tube G, which is connected at the lower end to the front forks G', or, more properly speaking, to the crown G² of said forks. The frame is fitted with the usual front and rear wheels H H' of any approved pattern, the rear-wheel hub h being connected to the crank-shaft I by chain and sprocket, as is usual.

To give a clearer understanding of the main feature of my invention, I have indi-

cated the vertical diameter or vertical radius of the steering-wheel by a vertical line 1 1 in Fig. 1, the plane of the steering-centers being indicated by a line 2 2. The dotted lines 5 2^a 2^a denote the planes or axial lines 4 of the steering head or centers after adjustment (indicated by the dotted positions of the frame.)

One arrangement of parts by which I am enabled to adjust the rake of the steering-10 head is illustrated in Figs. 1, 3, 4, and 5, wherein the braces D are connected at their upper ends to the seat-post tube E in such a manner as to be adjustable thereon, so that the upper end of said tube E may be moved 15 farther from or nearer to the center of the rear wheel II', or, in other words, moved forward or back through an arc having the crank-shaft I as a center. As the tubes A, B, E, and F are rigidly connected, it follows that 20 the steering-head, of which the head-sleeve F forms a part, will maintain its parallelism with tube E, the rake or inclination of said steering-head being thereby changed as desired. The brace-tubes D are at their lower 25 ends provided with eyes which may embrace the rear axle h' or a frame-bolt, thus providing for the necessary pivotal action of said brace-tubes, and are provided at their upper ends with stubs d, brazed therein, and provided with transverse openings d' for the pas- 30 sage of the bolt D', which secures said ends to the sleeve or clip E', surrounding tube E.

The sleeve or clamp E' may be split at its front side, as shown in Fig. 4, and provided 35 with apertured lugs e to receive a clamping-bolt e', by which said sleeve may be tightly clamped to the tube E after adjustment thereon, and is at the rear provided with horizontally-projecting arms e², pierced in the di- 40 rection of their length to receive the bolt D'. Said sleeve E' may be split also at its rear side, or only at its rear side, as indicated in Fig. 3, the bolt D' then serving as the clamp- 45 ing-bolt. To provide against the accidental slipping or twisting of the clamp E' on tube E, said tube may be provided with a web or fin E², brazed thereon. This web or fin may be notched, as shown, the bolt D' passing 50 therein, as indicated.

To admit of the described adjustments in the frame as so far described, the tubes A, B, E, and F as a whole must be pivoted upon the rear part of the frame. Such a pivot is 55 shown in Fig. 1 as comprising a horizontal bolt or pin passing transversely through members of the frame, said pivot being arranged at the junction of the rear forks C and the hanger or sleeve K of the crank-shaft I.

60 As shown in Figs. 3 and 4, the stubs d of the braces D are provided at their inner sides with circular sockets or recesses d², bored concentric with the bolt-hole d', said sockets being designed to receive the cylindrical ends 65 of the arms e² of the clamp-sleeve E'. This construction, while permitting of the free pivotal movement of the braces D upon the

arms of the clamp-sleeve E', serves the further purpose of taking all lateral strain from the securing-bolt D', thus admitting of the 70 employment of an extremely light bolt.

It will be of course understood that the ends of the arms e² should enter the sockets d² with a tight fit to avoid lateral play and consequent rattle and that the sockets and engaging ends 75 of the arms e² may be slightly tapered to form, in effect, cone-bearing surfaces which may be adjusted to compensate for wear.

A modification of the described construction admitting of the hereinbefore-described 80 adjustment is illustrated in Fig. 10, wherein the lower ends of the braces D are adjustably secured at the rear axle. The particular means employed for effecting adjustment at this point will not be described herein, as the 85 same is embodied as a part of the subject-matter of a concurrent application filed by me. In machines having the adjustment at its rear axle the frame as a whole might be constructed as before described, though pref- 90 erably the upper or forward ends of the braces D would be connected directly to the forward part of the frame instead of to an adjustable sleeve, such as E'. A still further modification of the before-described construc- 95 tion is indicated by the dotted lines in Fig. 7, wherein the clamp-sleeve E' is represented as secured to the upper reach-tube A and adjustable horizontally thereon.

Still another construction by which my in- 100 vention may be carried into practical effect embraces the elongation or shortening of the brace-rods by oppositely-threaded sleeves L, Fig. 9, or other equivalent means. Thus constructed the lengthening of the member D 105 will move the upper part of the head forward and decrease the rake thereof, while an opposite adjustment of said member D will have the opposite effect and increase said rake in the head. 110

Any approved means may be employed for effecting the lengthwise adjustment of the tube D, such as the well-known form of coupling-sleeve L (illustrated in detail in Fig. 7) or a turnbuckle, Fig. 6, and to avoid the 115 necessity of adjusting each brace-tube D separately yokes M, Figs. 7 and 8, and a short adjusting-rod m may be employed to connect the upper ends of said tube D with the forward part of the frame. 120

In what is known as "drop-frame" safeties—that is to say, machines having frames specially designed for use by women—the required adjustment of rake of the steering-head is effected in the same manner as al- 125 ready described.

In referring to the lengthening of the brace-rods D, I mean to include any construction producing such an effect, whether it be the sleeve L or a turnbuckle or the means shown 130 in Fig. 8.

I claim—

1. A safety-bicycle frame provided with horizontal pivots upon which the frame mem-

bers may be rocked to change the rake of the steering-head, the rear brace-rod of the frame being adjustable to change the position of the pivoted members and to lock them after adjustment as described.

2. A safety-bicycle frame provided with horizontal pivots to admit of changing the rake of the steering-head, and with adjustable rear brace-rods provided at one end with a

clamp-sleeve to lock the movable ends of the rear brace-rods to a rigid part of the frame, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

FREDERICK D. OWEN.

Witnesses:

HENRY E. COOPER,
CHAS. F. O'NEILL.