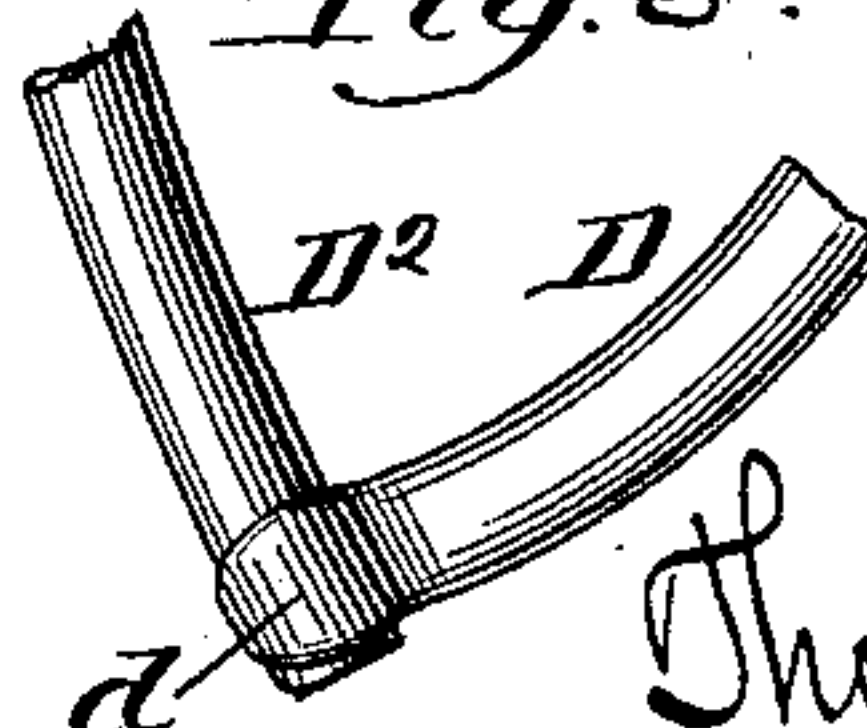
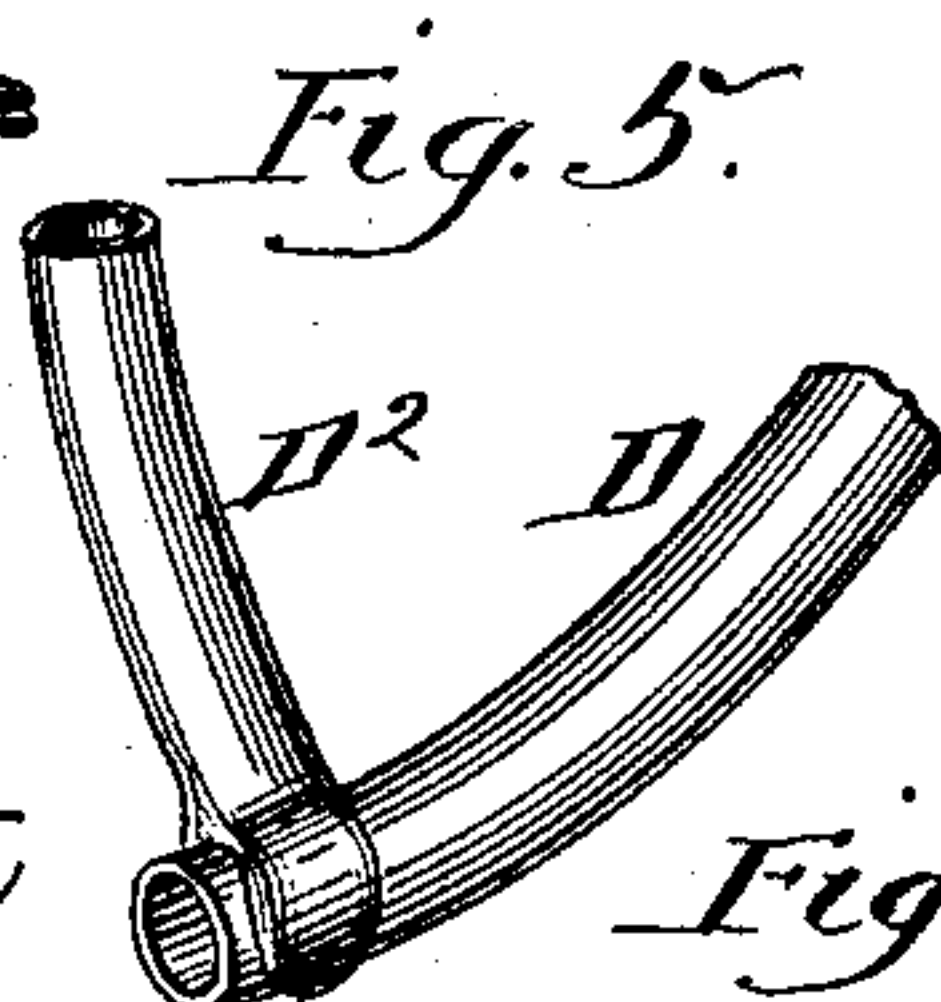
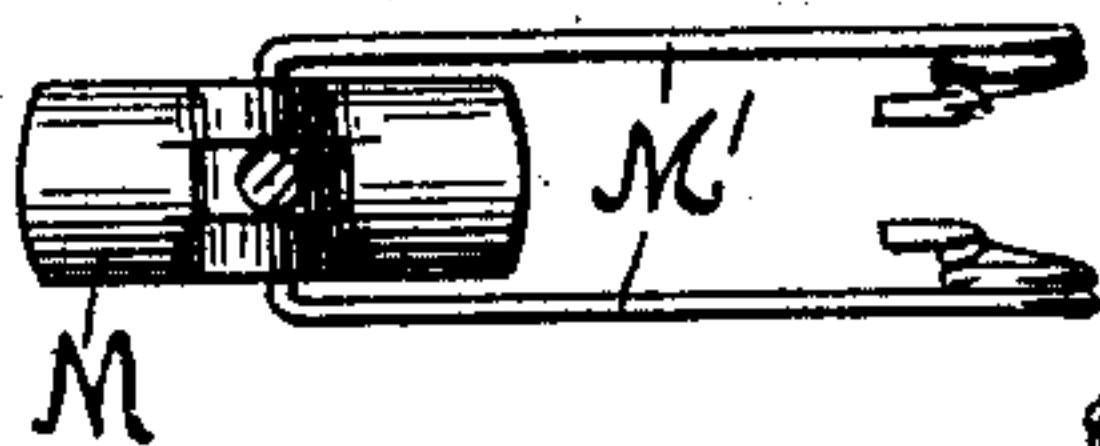
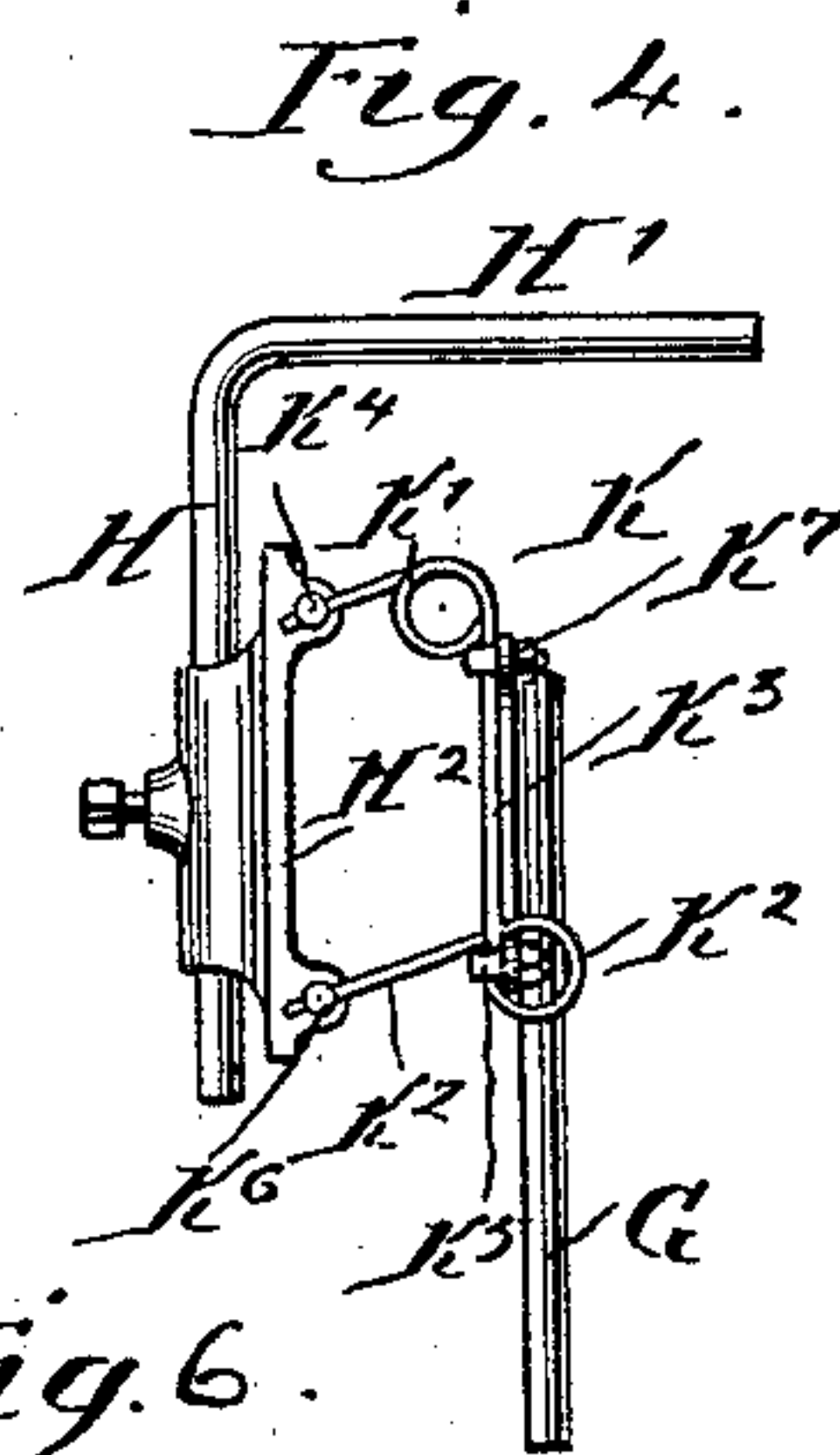
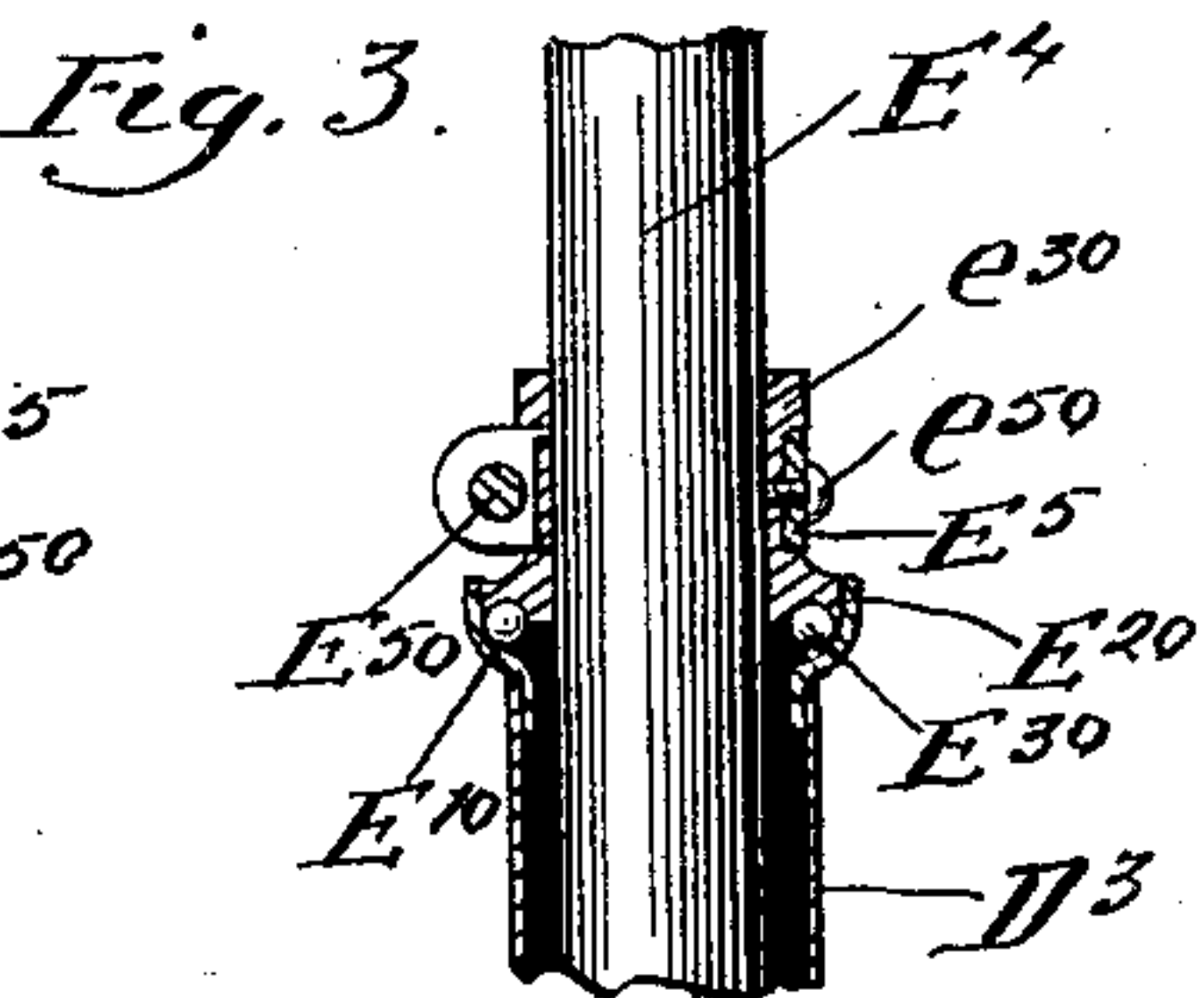
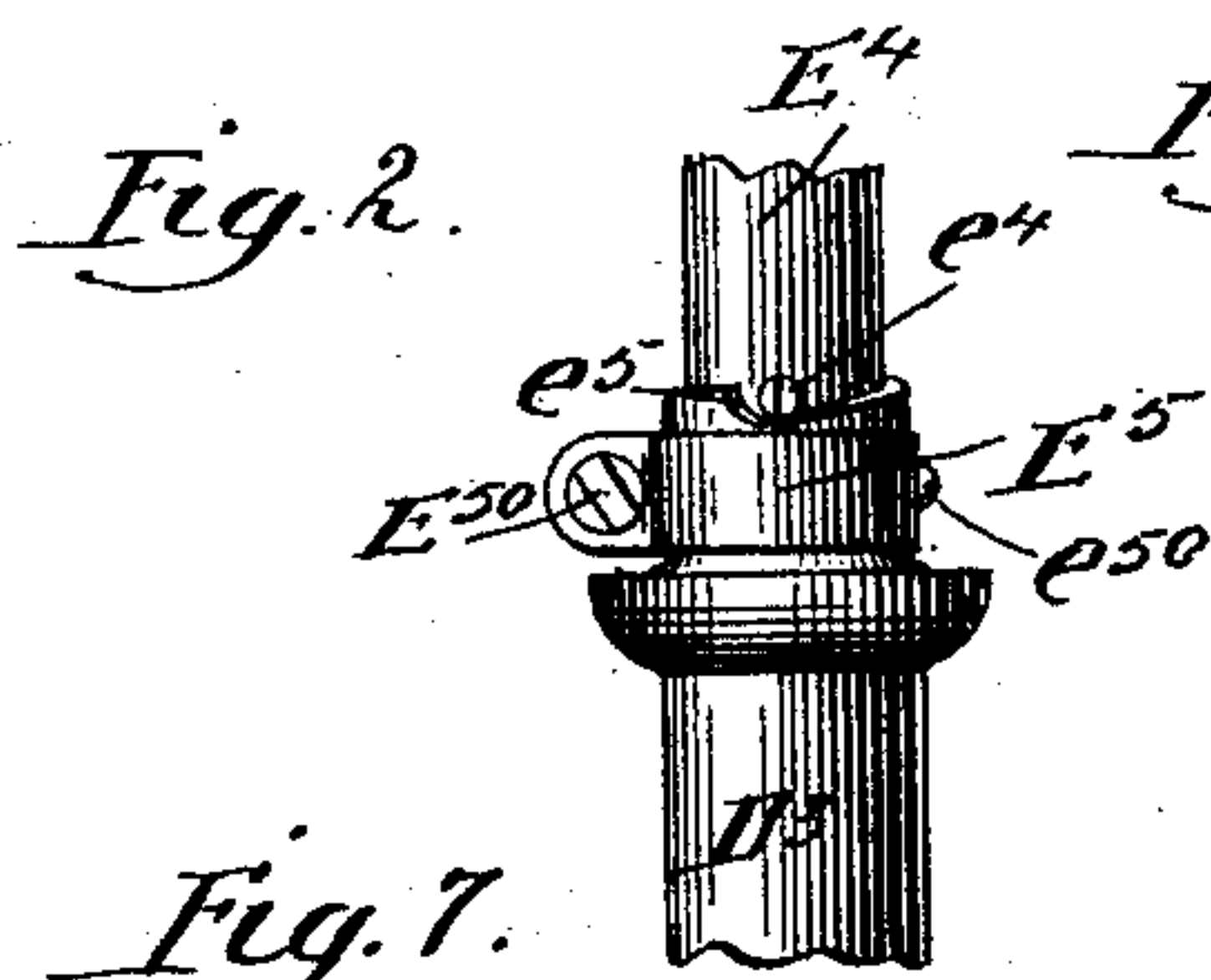
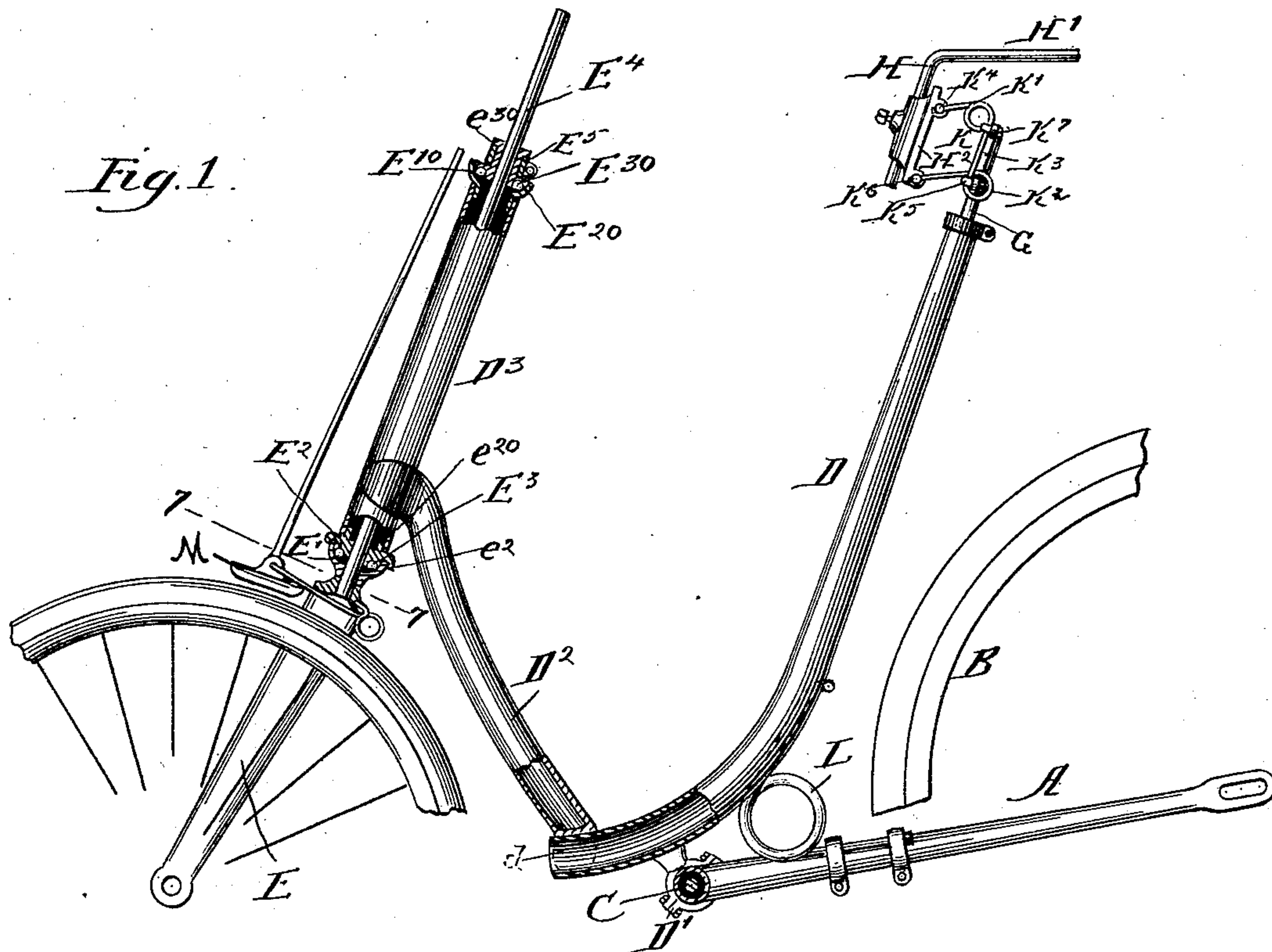


(No Model.)

T. B. JEFFERY.
VELOCIPÈDE.

No. 411,035.

Patented Sept. 17, 1889.



Witnesses:
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UNITED STATES PATENT OFFICE.

THOMAS B. JEFFERY, OF RAVENSWOOD, ILLINOIS.

VELOCIPEDÉ.

SPECIFICATION forming part of Letters Patent No. 411,035, dated September 17, 1889.

Application filed October 15, 1888. Serial No. 288,096. (No model.)

To all whom it may concern:

Be it known that I, THOMAS B. JEFFERY, a citizen of the United States, residing at Ravenswood, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Velocipedes, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part thereof.

10 In the drawings, Figure 1 is a detail sectional side elevation showing the frame-work of my improved velocipede, section being made in the vertical plane of the steering-head axis at the upper and lower bearings of the steering-head and at the junction of the two arms of the frame. Fig. 2 is a side elevation, and Fig. 3 an axial section, of the upper steering-head bearing of a slightly modified form from that shown in Fig. 1. Fig. 4 is a detail of the seat-supporting spring and bracket on a larger scale than Fig. 1. Figs. 5 and 6 are detail perspectives of alternative forms of junction of two branches of the seat-supporting frame. Fig. 7 is a section at the line 7 7 on Fig. 1. Fig. 8 is a perspective detail of the sleeve which constitutes the adjustable bearing of the steering-head.

A is the rear driving-wheel frame or fork.

30 B represents the outline of the rear driving-wheel.

C is the pedal-crank shaft.

40 D is a two-part box secured to the seat-supporting frame and constituting the means of pivoting said frame to the rear driving-wheel frame or fork. The seat-supporting frame and steering-head are formed as a single rigid frame, comprising the parts D', D², and D³, the last being the steering-head proper, all of said parts being tubular. The part D' extends from the pivot above the pedal-crank shaft upwardly and with a slightly rearward inclination, and at its upper end has the seat-support inserted in it. At the lower part the boss D' curves forward, so that it terminates at the lower end approximately horizontally, and to said lower end there is secured the arm D², which extends almost straight upwardly and forwardly to its junction with the lower part of the steering-head B³. Both the junctions of the part D² with the adjacent parts D and D³ may be made in either of the

ways shown in Figs. 5 and 6—that is, either of the two joined parts may terminate in diverging lugs *d*, which clasp and are brazed to the other part, the end of the part having the lugs abutting against the side of the clasped part. The advantage of this construction is that a shorter turn can be made than would be possible by bending the tubular arms without danger of weakening or cracking them, and that a neater and lighter junction is effected than could be made by a separate junction-piece secured to each, and that neither part is weakened, as would be the effect of screw or rivet holes.

65 E is the steering-wheel fork. To its upper end there is secured the cup-shaped fitting E', which forms one part of the steering-head lower bearing, and a similar fitting E'¹⁰, adapted to have its end inserted within the steering-head, is secured to the upper end of the steering-head. To the lower end of the steering-head there is secured the fitting E², which has the flange *e*² fitting outside of the upper edge of the fitting E', while the boss or main body portion of said fitting E² enters within the cup of the fitting E', whereby the two parts E' and E² are accurately retained in relation to each other. The lower face or end of the part E² has an annular groove to receive the anti-friction balls E³, which bear in said groove and on the concave upper surface of the cup-shaped fitting E'. The fitting E² has an upwardly-projecting annular flange *e*²⁰, which fits within the lower end of the steering-head, and by means of which said steering-head and fitting are rigidly secured together.

90 E⁴ is the steering rod or spindle, which is rigidly secured to the upper end of the fork E and to the fitting E', and which passes through the central opening in the fitting E², and thence up to the steering-head, and through the fitting E'¹⁰, above which it protrudes as the upper end of the steering-head. To said spindle there is made fast, in the manner hereinafter described, the sleeve E²⁰, which corresponds to the fitting E² at the lower end of the steering-head, having on its under face an annular groove for anti-friction balls E³⁰, which bear also upon the upper concave face of the fitting E'¹⁰. The sleeve E²⁰ is

secured to the spindle E^1 by means of the clamp E^5 which encircles it, and terminates in lugs e^5 , through which the clamping-bolt E^{50} is passed to draw them together and pinch
5 or contract the sleeve E^{20} within said clamp, to cause it to bind firmly upon the spindle E^1 .

In order to retain the clamp E^5 about the sleeve E^{20} , the latter is preferably provided with the flange e^{30} at the upper end. By this
10 construction the steering-head is retained between the two ball-bearing joints described, the one at the upper and the other at the lower end of the steering-head, and in order that these bearings may be kept at all times
15 from play longitudinally with respect to the steering rod or spindle, the sleeve E^{20} may be from time to time adjusted on the spindle by loosening the clamp E^5 and tightening it again after the sleeve is adjusted to the de-
20 sired position.

It may be found desirable in some cases to employ a tubular steering-rod, which will of necessity be of greater diameter than the solid spindle or rod E^1 . Such construction is
25 illustrated in Figs. 2 and 3, and when it is adopted the sleeve E^{20} may have its upper edge made in a spiral form, as illustrated in Fig. 2, thereby constituting a cam which may operate against a stud e^4 , projecting from the
30 rod E^1 , its position when the parts are originally assembled being at the lowest point of the spiral cam of the sleeve E^{20} when the ball-bearings are adjusted properly and without undue play. When this construction is
35 adopted, the clamp E^5 will be fastened to the sleeve E^{20} , preferably at a point opposite the lugs E^5 , as by means of the screw e^{50} , and when it is desired to adjust the ball-bearings to take up any lost motion, the clamping-bolt
40 E^{50} being loosened, the clamp carrying with it the sleeve E^{20} will be pushed round on the rod E^1 , the spiral cam edge operating against the stud e^4 , with a tendency to crowd the sleeve E^{20} downward on the steering-rod until all lost motion is taken up.
45

In order to permit the sleeve E^{20} to be contracted, as described, by the clamp E^5 sufficiently to bind upon the steering-rod E^1 , it is necessary either to make the sleeve quite thin
50 at the part where it is encircled by the clamp, so that it will readily yield to the pressure of the latter, or to split it, as illustrated in Fig. 8.

The adjustment herein provided for opposite ball-bearings is not limited in its application to the steering-head, but may be made use of in many similar situations, the steering-rod being in effect an axle, and I do not
60 limit myself to the use of this device on a steering-head alone.

The seat is designed to be secured upon the horizontal arm II' of the angular bracket II , the vertical arm being adjustably secured in the bracket II^2 . The last-mentioned bracket
65 is supported upon the two ends $K' K^2$ of the similar springs $K K$. Said springs are both secured to the expanded portion G' of the

rod G , which is inserted in the upper end of the frame-arm D , and secured adjustably at any desired height in said arm by the clamp
70 G' , which encircles the end of the arm D and serves to contract the same about the rod G . The springs $K K$ consist each of two spiral coils k' and k^2 and the straight portion k^3 , extending from coil to coil, and the ends $K' K^2$,
75 running from the coils $k' k^2$, respectively. Said ends K' and K^2 are parallel to each other, and parallel also to the corresponding ends of the other spring. The ends K' of the two springs are connected by a shaft K^4 , and
80 the ends K^2 by a similar shaft K^5 , and upon said shafts K^4 and K^5 the bracket H is hung. The straight portion k^3 between the coils affords the means of securing the springs to the flat portion G' of the rod G , as stated, and
85 this may be done in any convenient manner, as by the bolts K^4 and K^5 , as illustrated. The ends K' and K^2 act as parallel links to guide the seat and keep the vertical arm of the bracket H in all positions substantially par-
90 allel to the rod G . The four ends of the two springs each project from one of the coils with a downward inclination, whereby the movement of the seat when jarred by the wheel encountering an obstruction is backward and
95 downward, as is desirable. A spring L is provided, located, preferably, near the pivot of the driving-wheel fork to the seat-supporting frame, and reacting between said two parts to uphold the latter yieldingly. The
100 form and action of this spring are familiar, and need not be further described. The brake M is sustained by a spring-arm M' , which is secured to the steering-wheel fork on both sides of the vertical plane of the
105 steering-wheel, both ends of the arm being thus made fast, the brake being attached to the intermediate portion, which normally holds it off the wheel and yields to allow it to contact the wheel, the spring-arm being the
110 only support or connection necessary.

I claim—

1. In a velocipede, a rigid frame intermediate the driving-wheel fork and the steering-wheel fork, and made of tubular parts successively joined together, each joint being
115 made by diverging lugs on the end of one of the joined parts clasping the other part, said end abutting against the side of the clasped part, substantially as set forth.

2. In a velocipede, in combination with the rear driving-wheel fork or frame, a frame pivoted thereto and comprising the steering-head and a seat-supporting arm, said steering-head and said arm being connected together
125 by a cross-arm joined to the lower end of each, each of said junctions being made by diverging lugs on the end of one of the joined parts clasping the other part, said end abutting against the side of the clasped part, substantially as set forth.
130

3. In a velocipede, in combination with the fork, the upwardly-concave fitting E' , terminating the fork at the upper end, the steer-

ing-head terminating at the lower end in a fitting E^2 , having the flange e^2 , adapted to fit outside the upper edge of the fitting E' , and having a central boss adapted to enter the concavity of E' , said boss having a ball-bearing groove on its under face, and the balls located in the concavity of the fitting E' and in said groove, and the steering-rod rigid with the fork and extending through the head, and a suitable stop-bearing for the upper end of the head, secured to the rod above the latter, substantially as and for the purpose set forth.

4. In combination with an axle and the part which revolves thereon, a sleeve on the axle constituting the bearing at one end for the revolving part and longitudinally extended beyond the portion which constitutes such bearing, and a clamp embracing such longitudinal extension, whereby the latter may be contracted about the axle to bind the sleeve thereon, substantially as set forth.

5. In combination with an axle and the part which revolves thereon, a sleeve located on the axle and serving as the bearing of the revolving part and longitudinally extended beyond the part which constitutes such bearing, and having the end or edge of such longitudinally-extended part oblique, and a stud projecting from the axle in contact with such oblique end, whereby the rotation of the sleeve on the axle tends to adjust it longitudinally thereon, substantially as set forth.

6. In combination with an axle, a sleeve thereon which has the bearing for the part

which revolves upon the axle, said axle having a stop which abuts against the end of the sleeve, one of said abutting parts having an oblique edge, whereby the rotation of the sleeve causes it to be adjusted longitudinally thereon, substantially as set forth.

7. In combination with an axle, a sleeve located thereon, constituting an adjustable bearing and extended longitudinally on the axle beyond the part which serves as a bearing, a clamp encircling such extended part, whereby it may be contracted to bind the sleeve onto the axle, a stop fixed on the axle and abutting against the end of the sleeve, one of said abutting parts having an oblique edge, whereby the rotation of the sleeve causes it to be adjusted longitudinally, a clamp being secured at one point to the box, whereby it serves both to adjust and to secure the sleeve in adjusted position, substantially as set forth.

8. In a velocipede, in combination with the wheel, a spring-arm rigidly secured to the fork on both sides of the vertical plane of the wheel, and the brake-shoe attached to the spring-arm intermediate the points at which it is thus secured and overhanging the wheel, substantially as set forth.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, at Chicago, this 12th day of October, A. D. 1888.

THOS. B. JEFFERY.

Witnesses:

N. G. HARRIS,

WM. A. DRYDEN, Jr.