

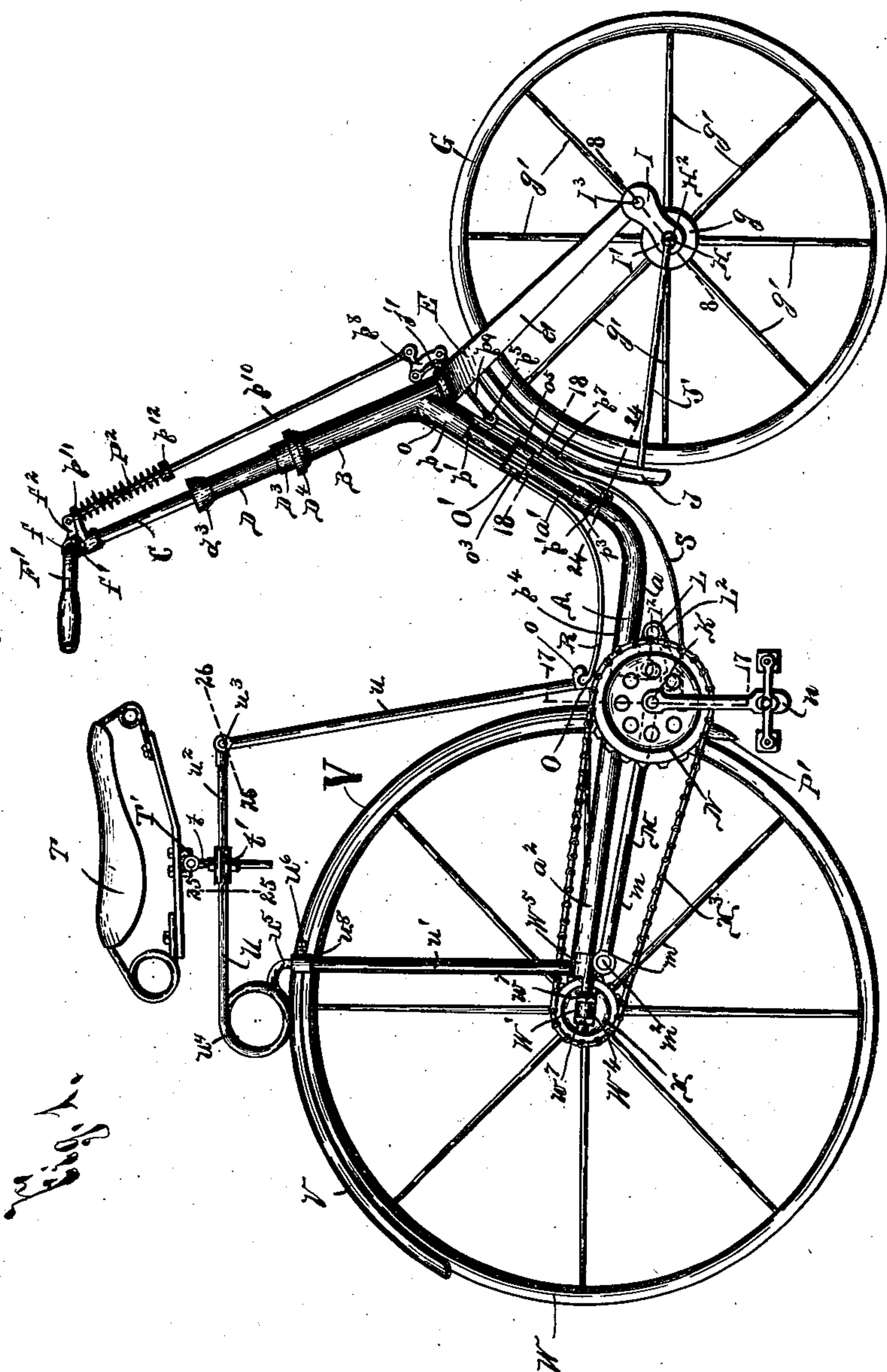
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8 Sheets—Sheet 1

H. LA CASSE.  
BICYCLE.

No. 518,411.

Patented Apr. 17, 1894.



WITNESSES:

*H. C. Chase*

*W. H. Randall*

INVENTOR

*Henry La Casse*

BY

*Henry Wilkinson & Cassin*  
ATTORNEYS.

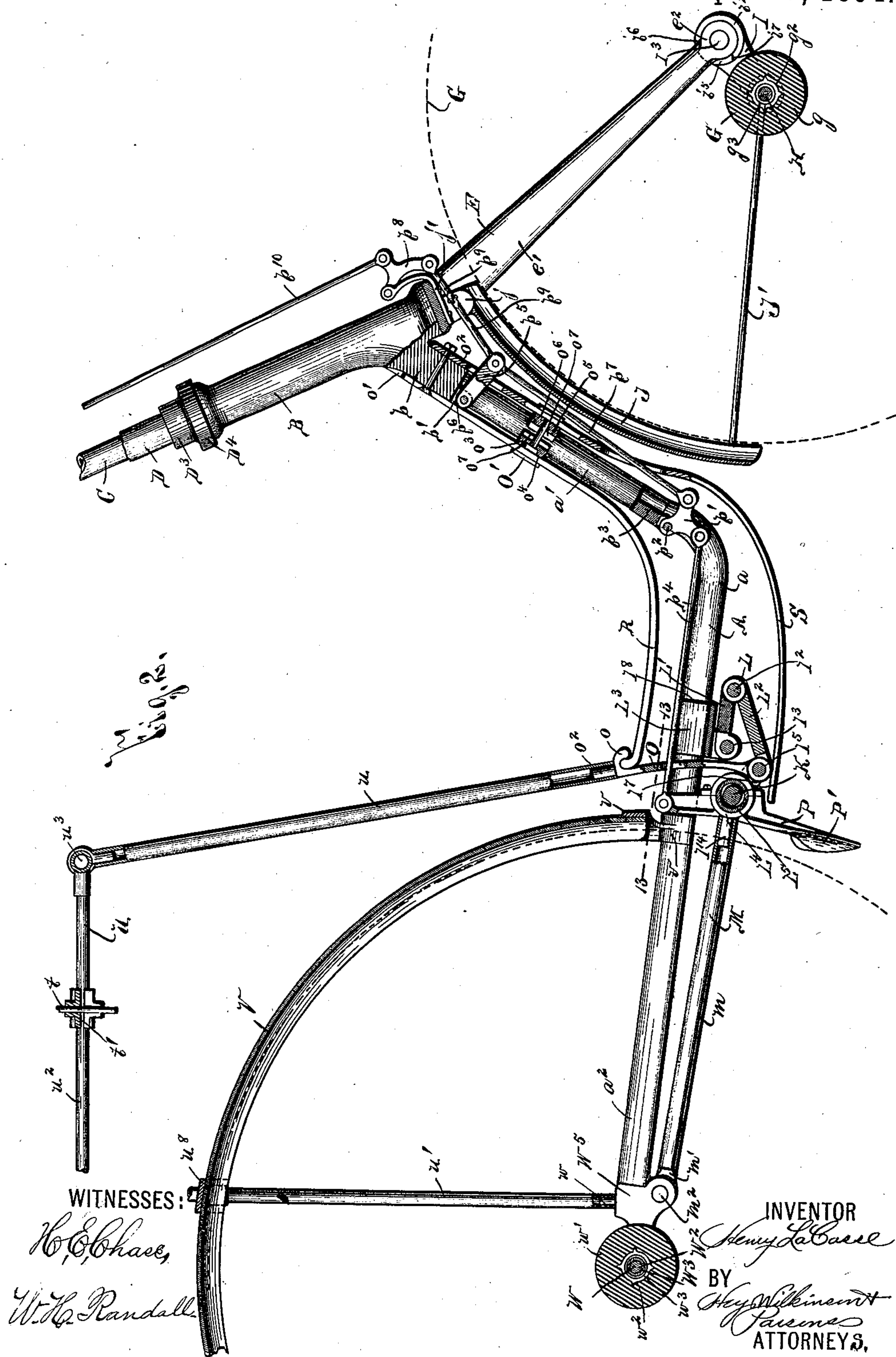
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BICYCLE.

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Patented Apr. 17, 1894.





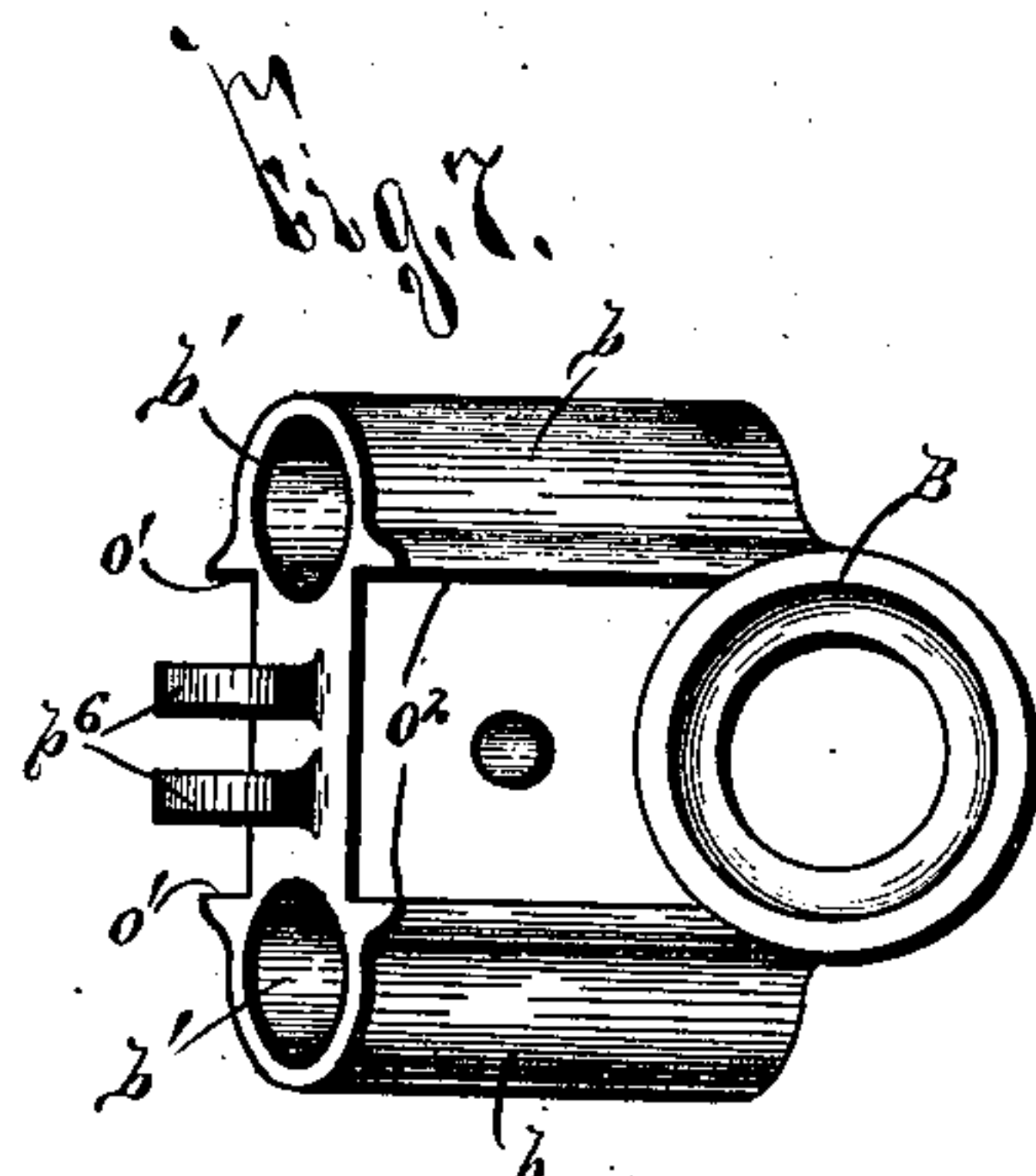
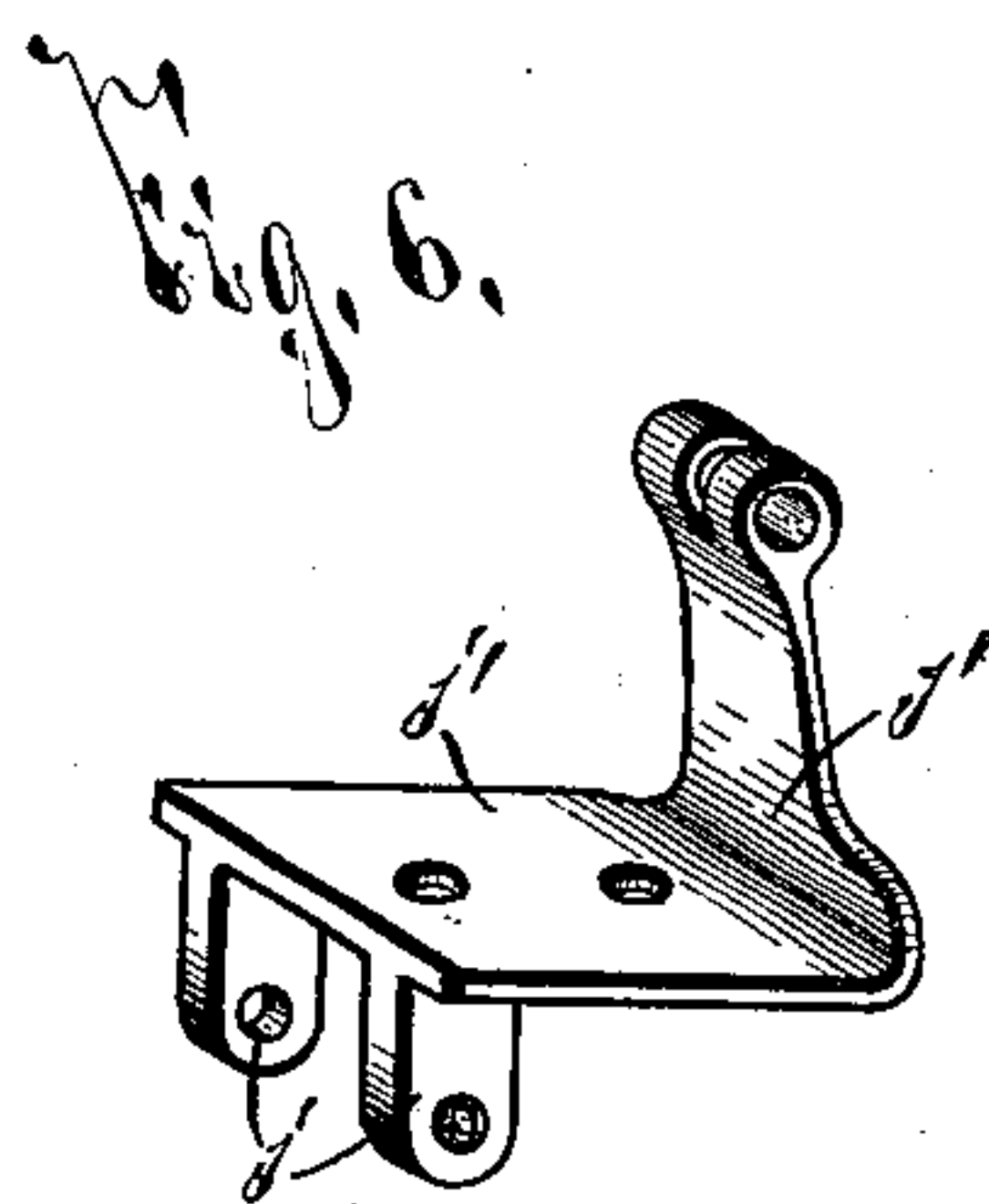
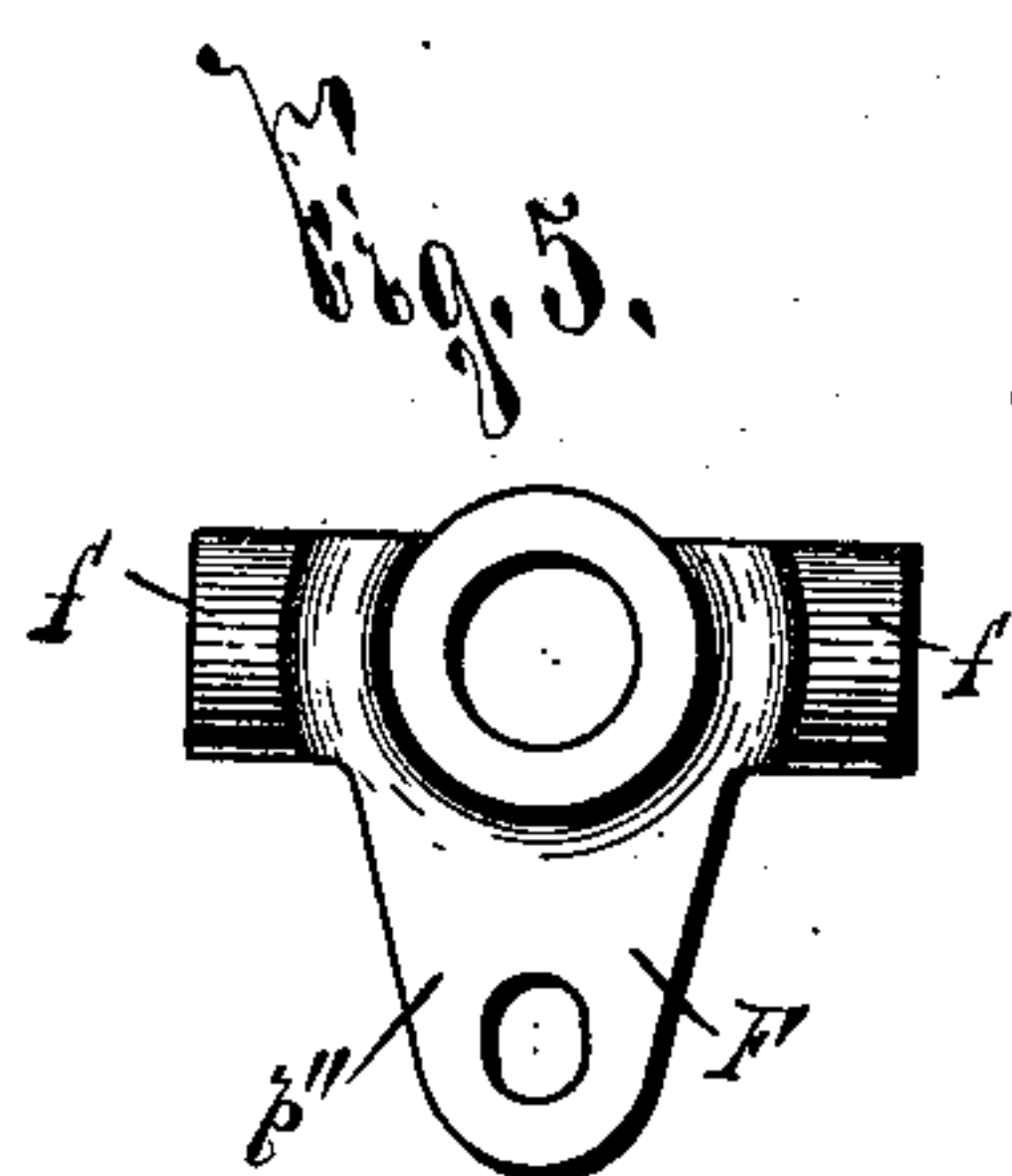
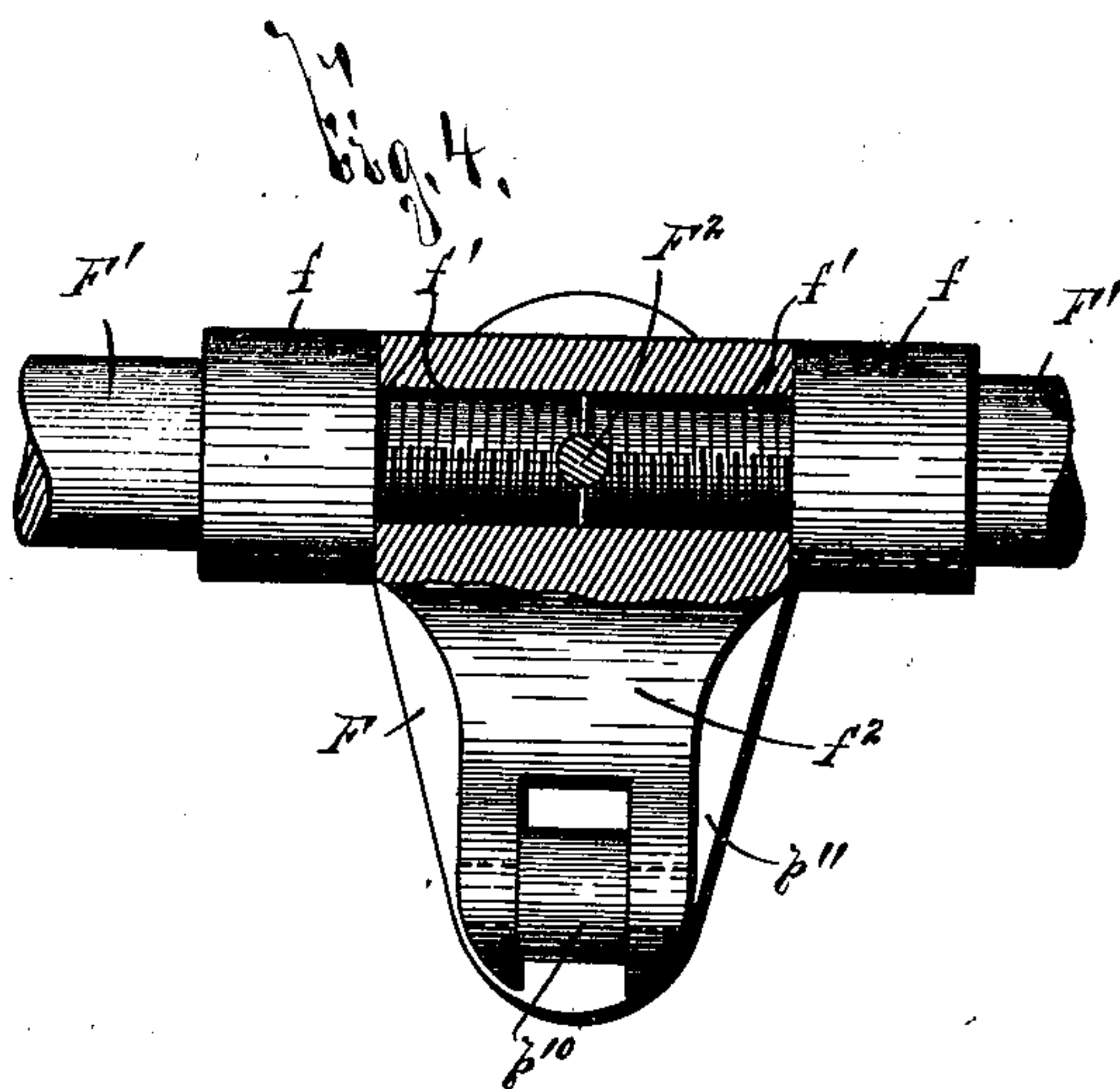
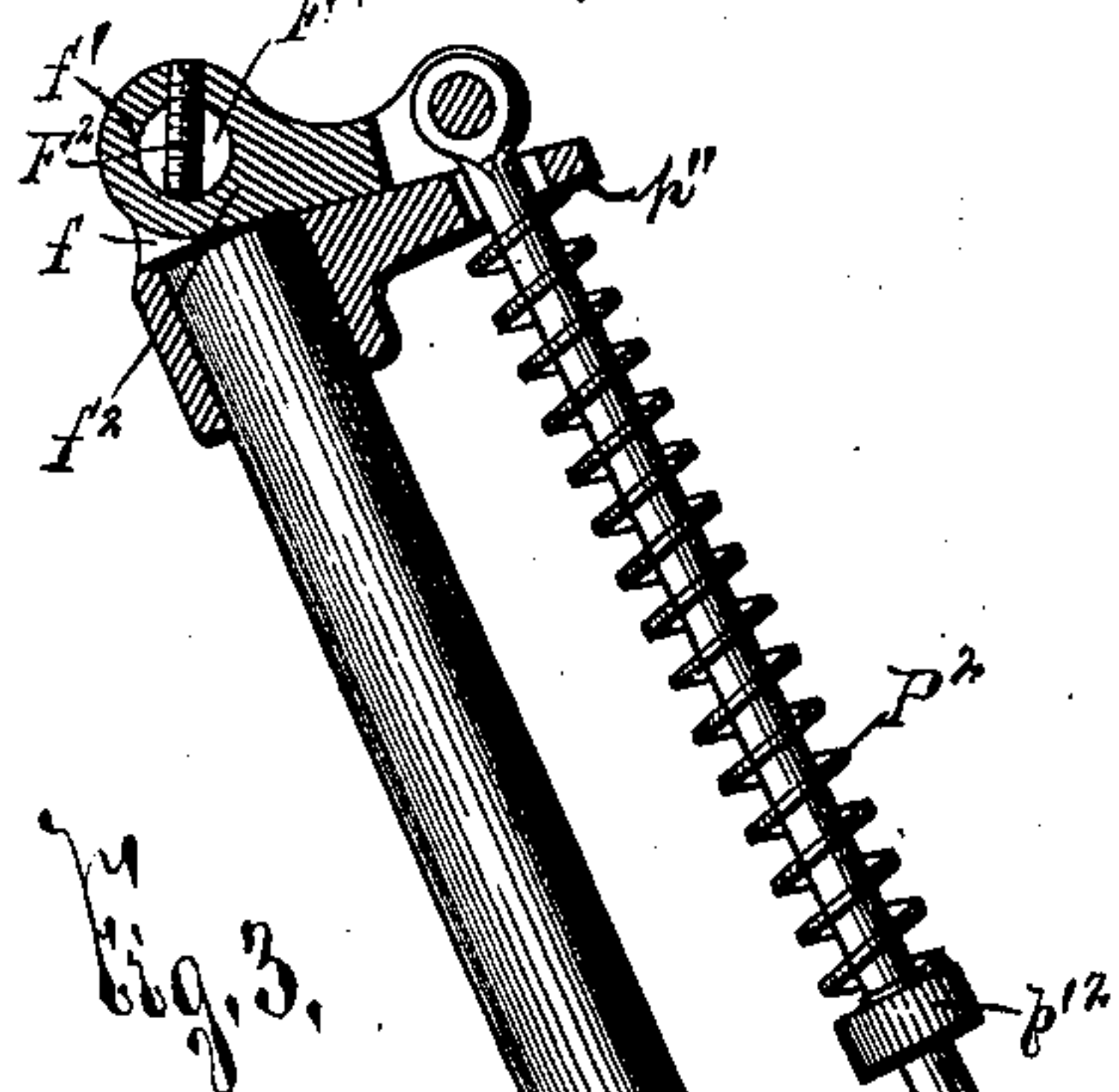
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H. LA CASSE.  
BICYCLE.

No. 518,411.

Patented Apr. 17, 1894.



WITNESSES:  
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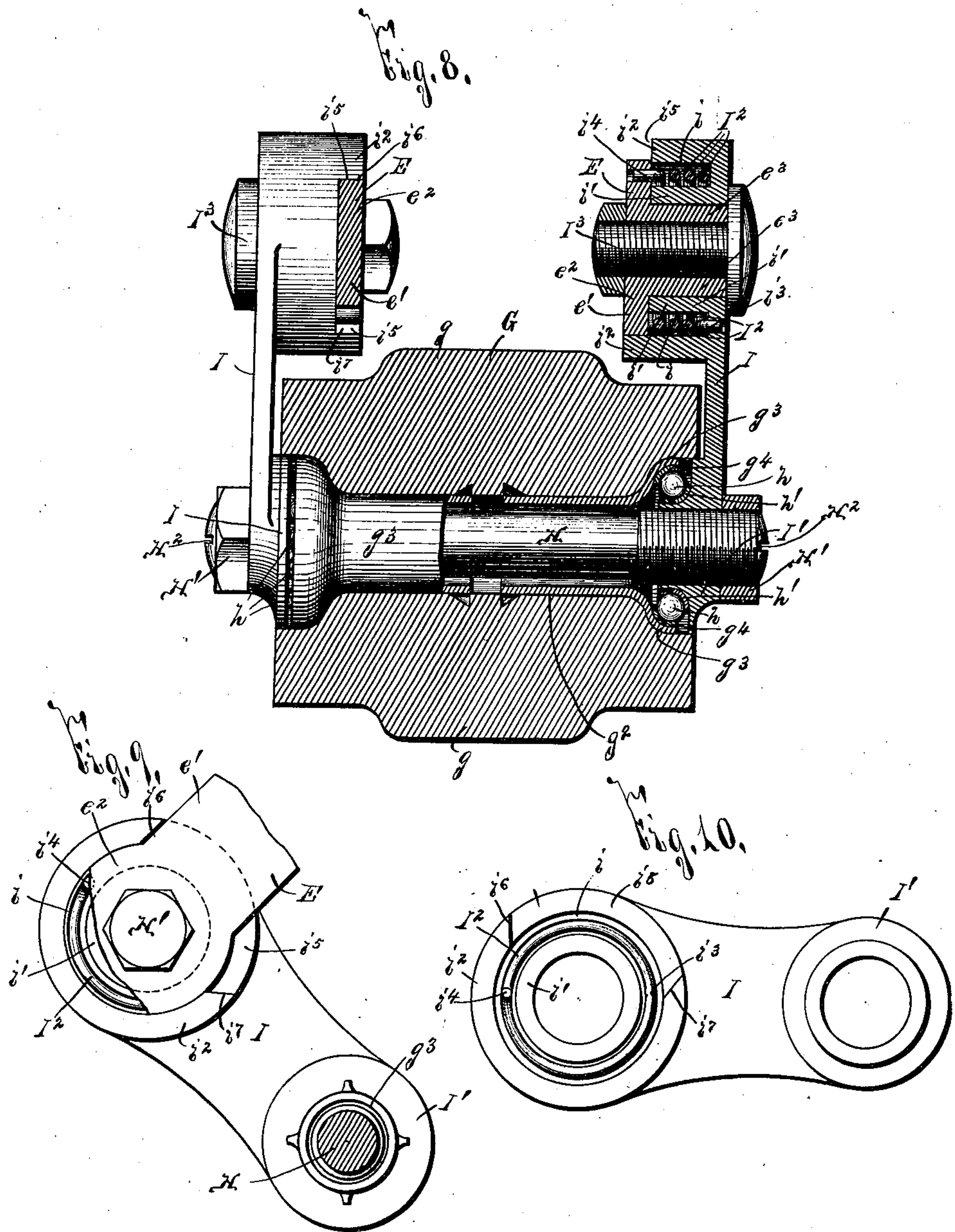
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8 Sheets—Sheet 4.

H. LA CASSE.  
BICYCLE.

No. 518,411.

Patented Apr. 17, 1894.



WITNESSES:

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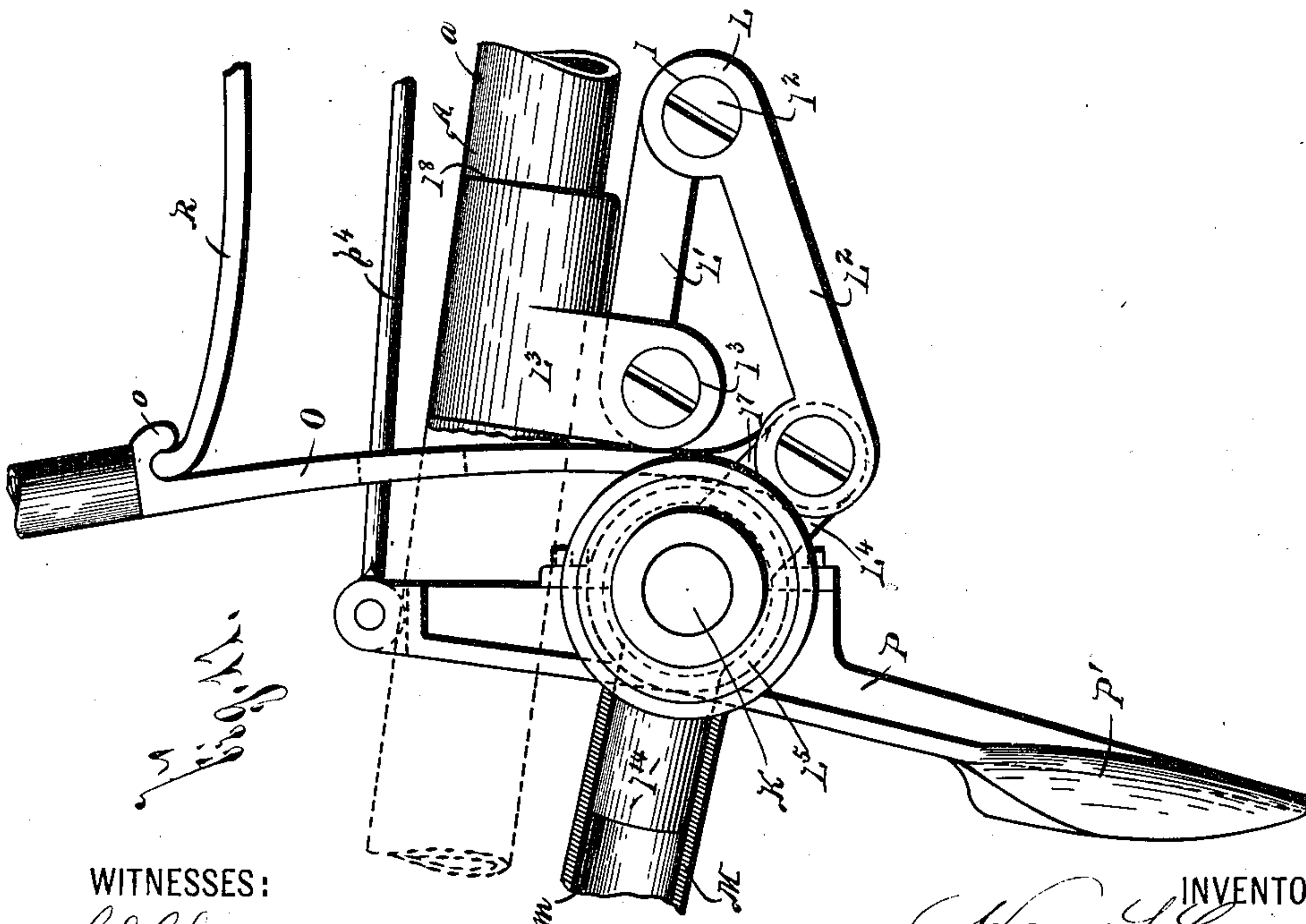
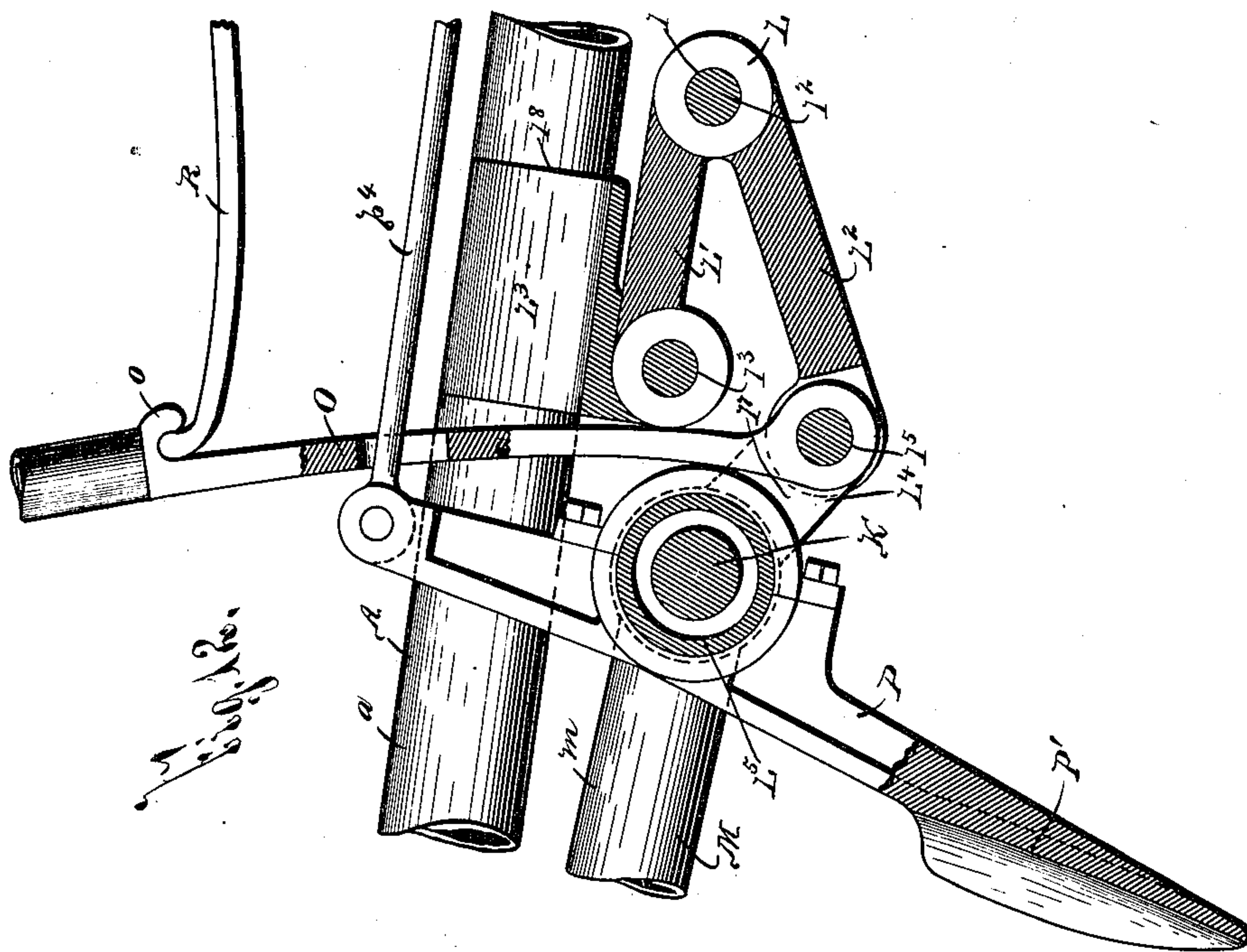
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H. LA CASSE.  
BICYCLE.

No. 518,411.

Patented Apr. 17, 1894.



WITNESSES:

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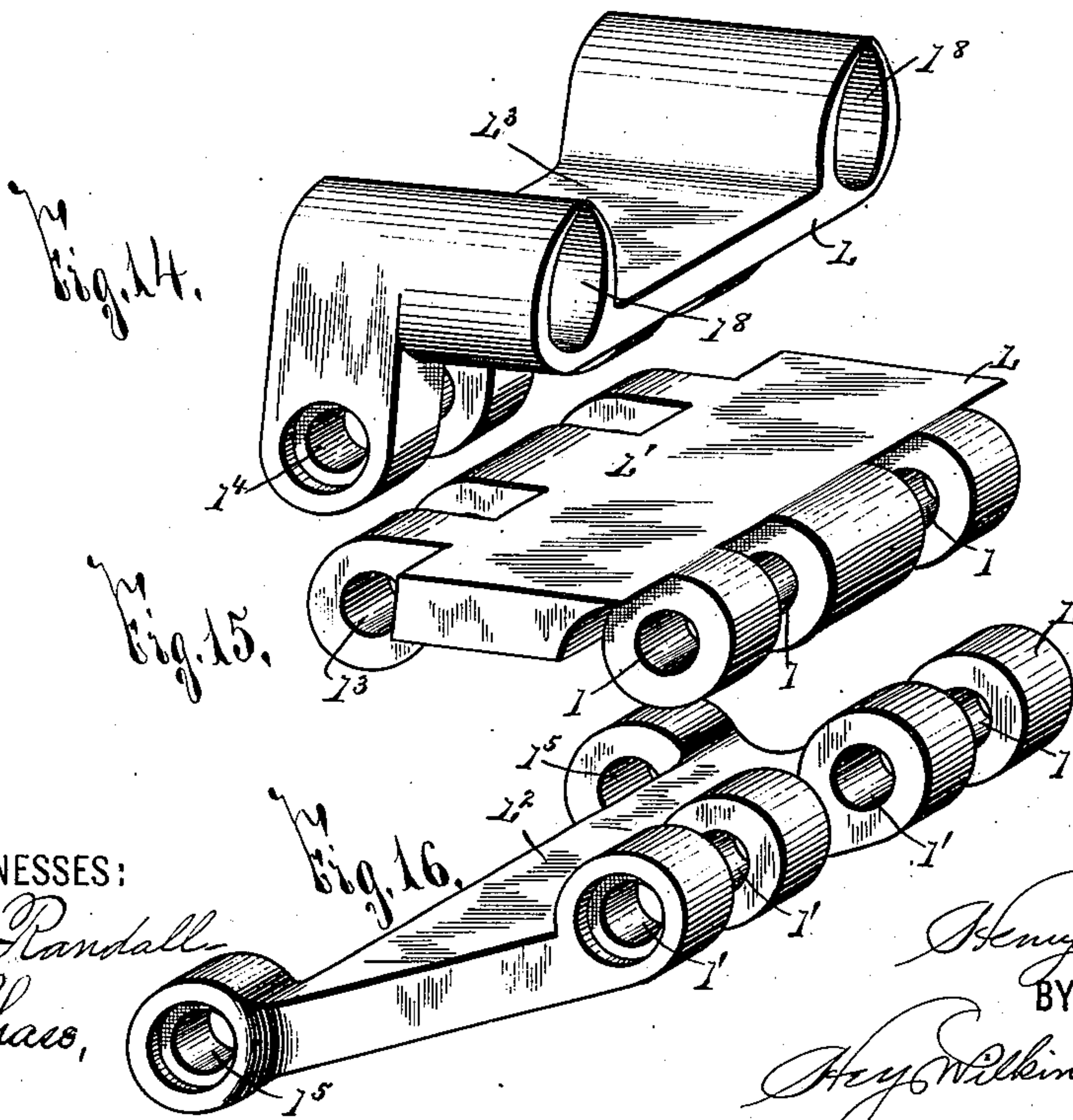
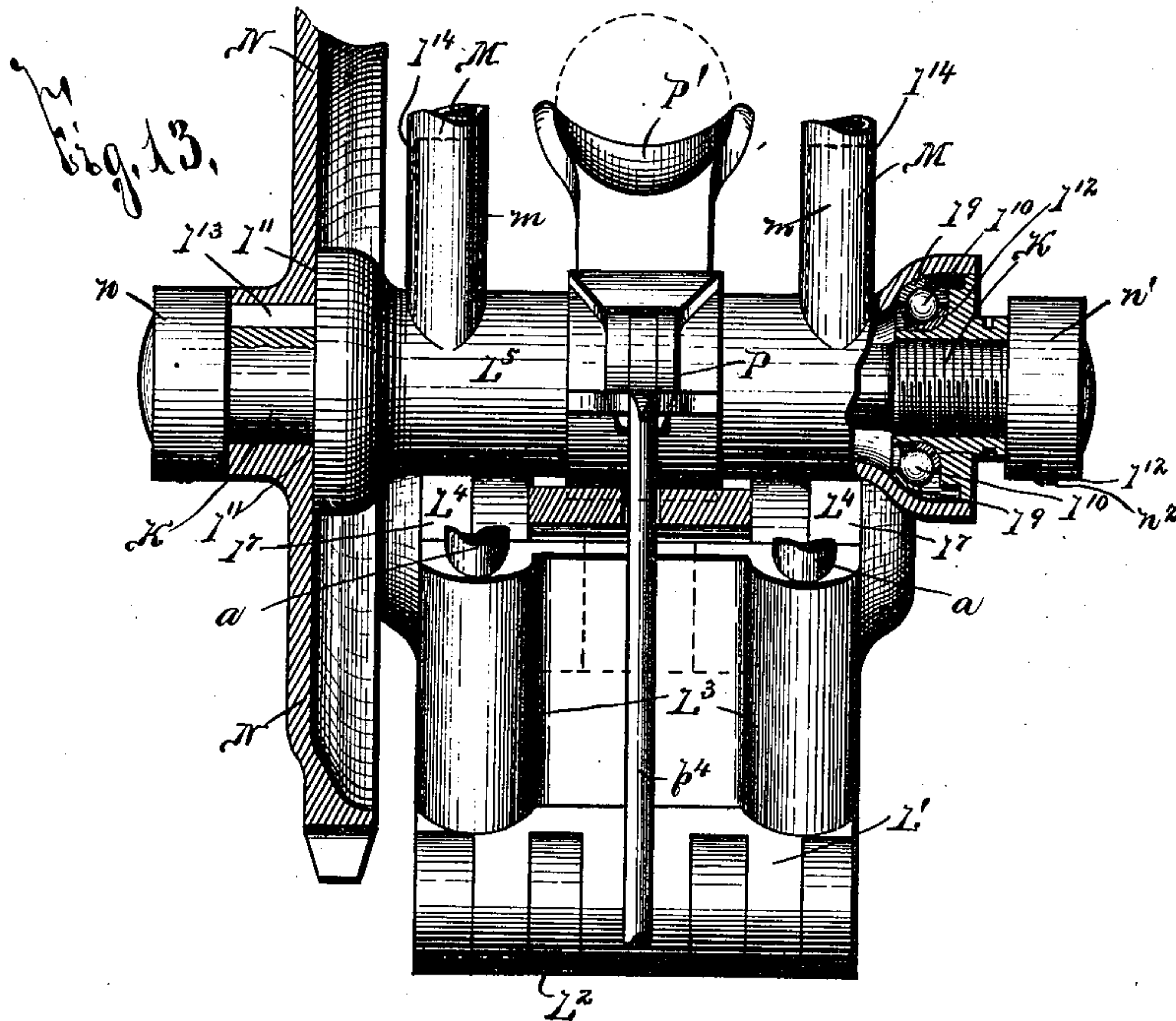
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8 Sheets—Sheet 6.

H. LA CASSE.  
BICYCLE.

No. 518,411.

Patented Apr. 17, 1894.



WITNESSES:  
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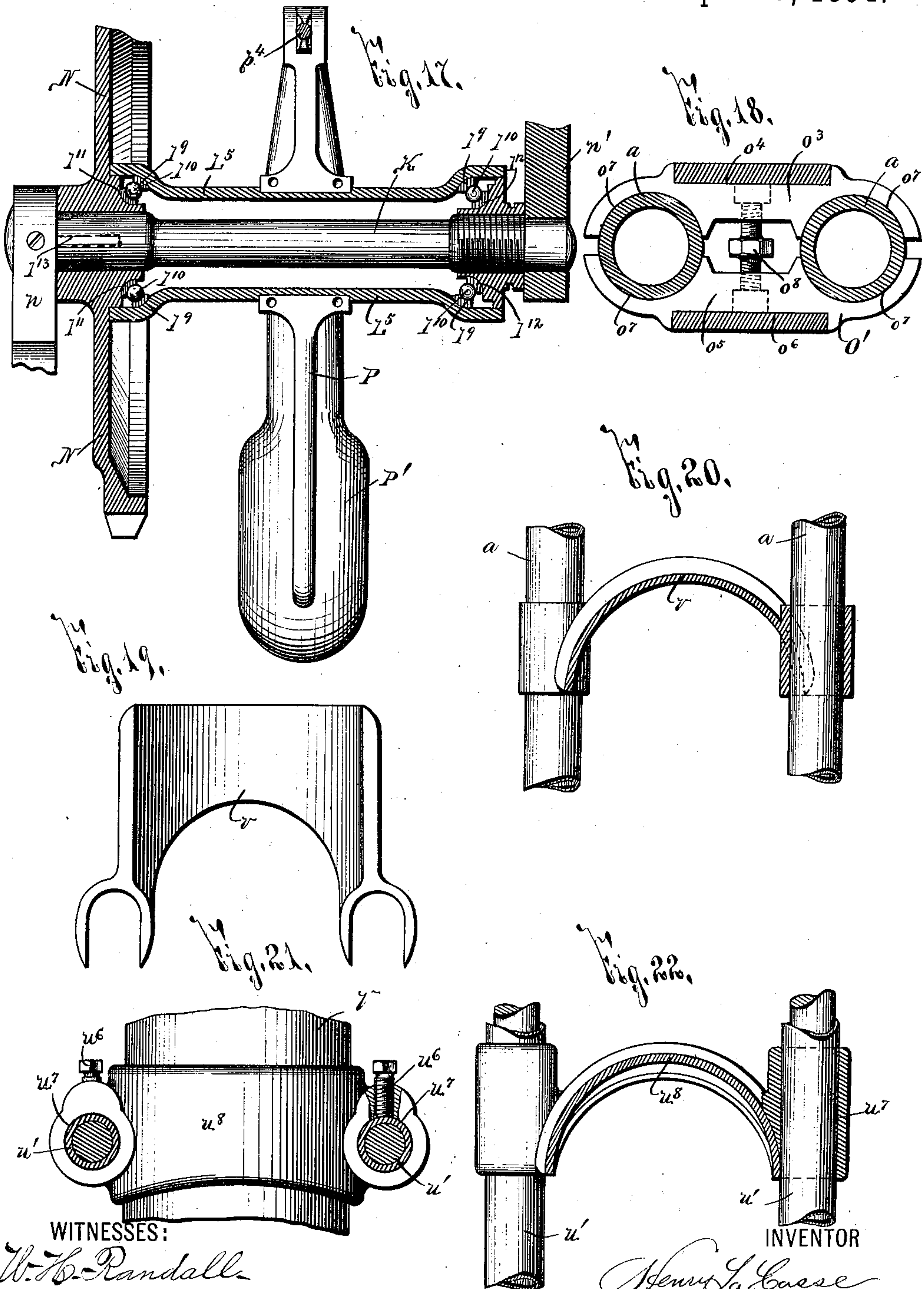
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8 Sheets—Sheet 7.

H. LA CASSE.  
BICYCLE.

No. 518,411.

Patented Apr. 17, 1894.



WITNESSES:

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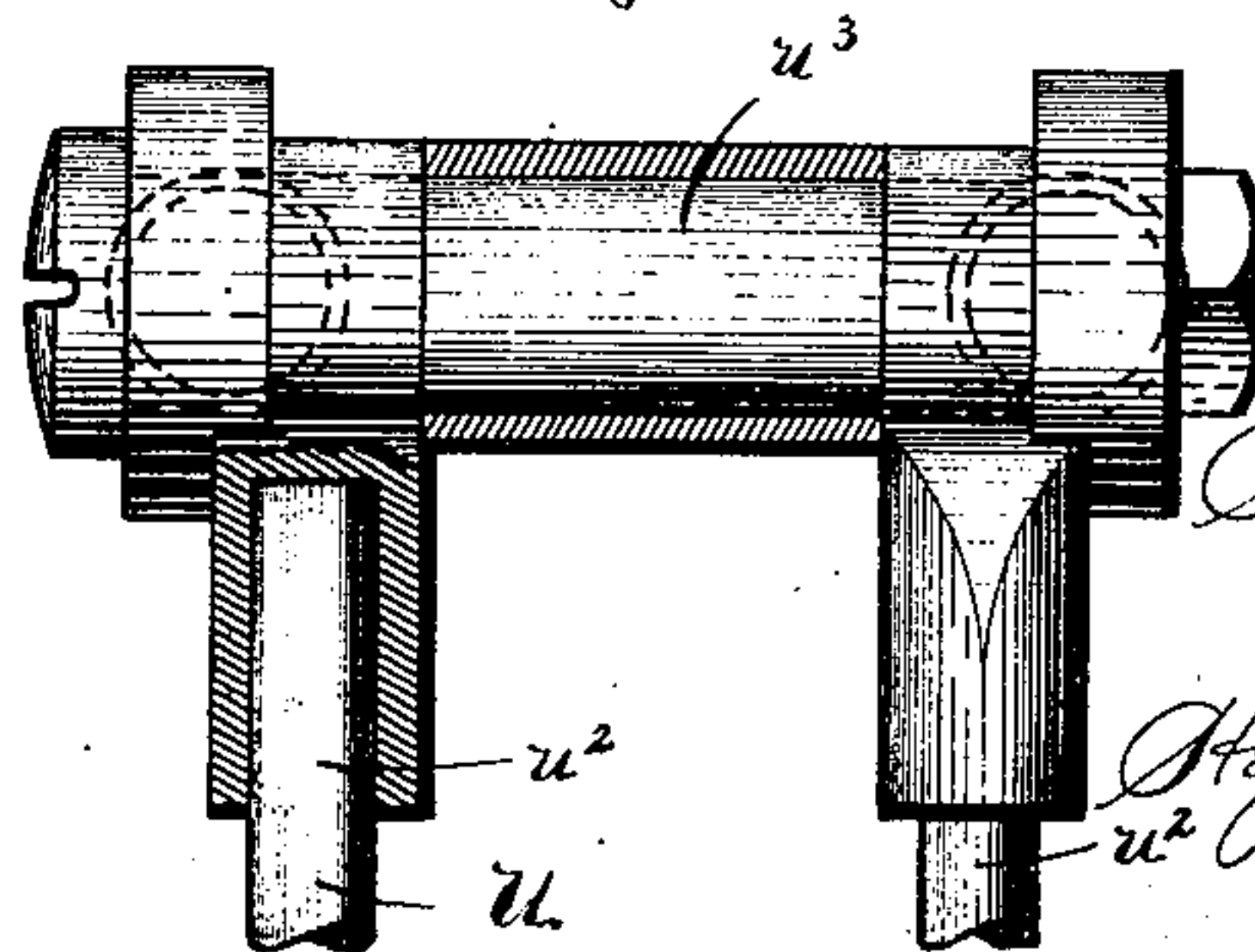
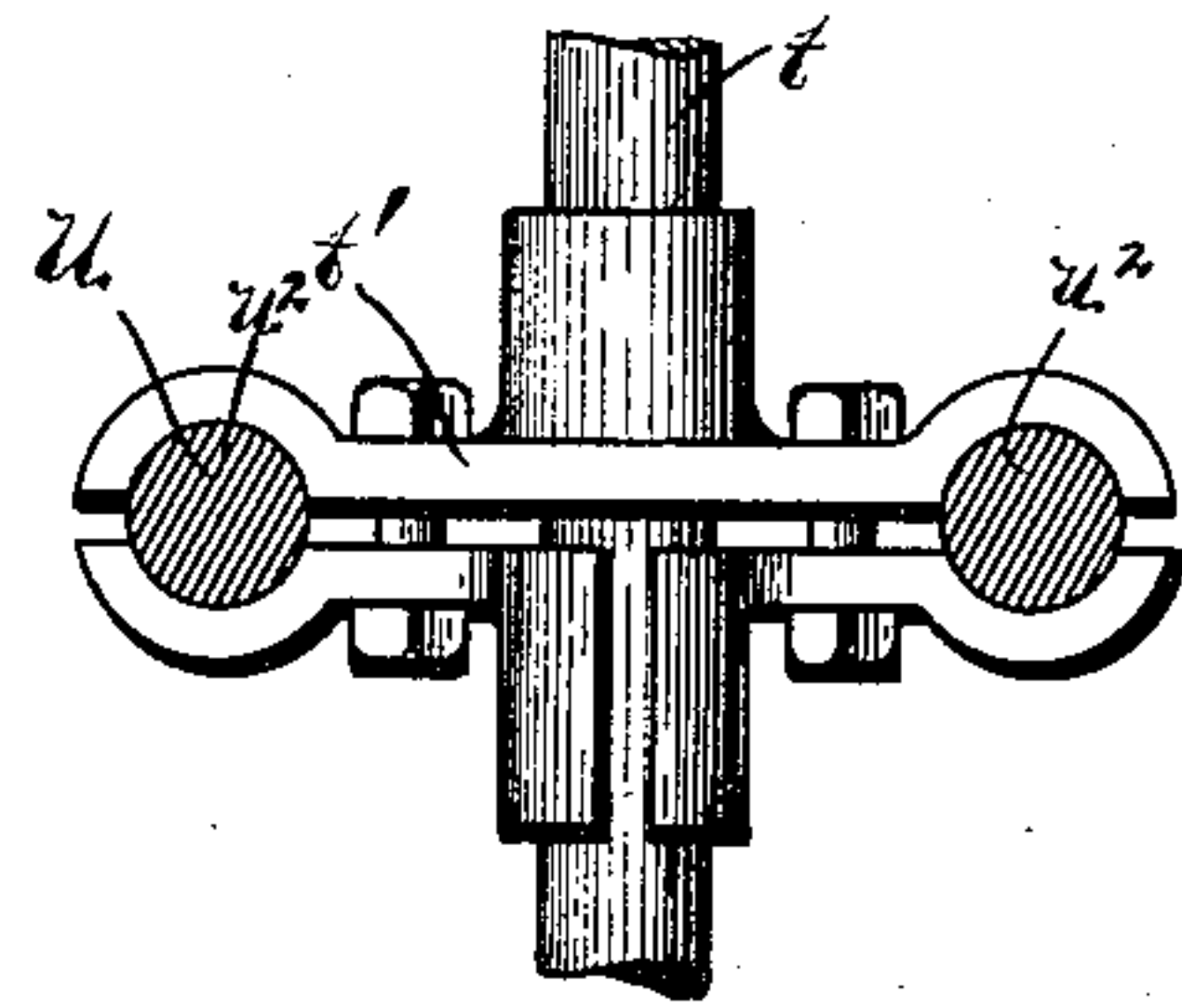
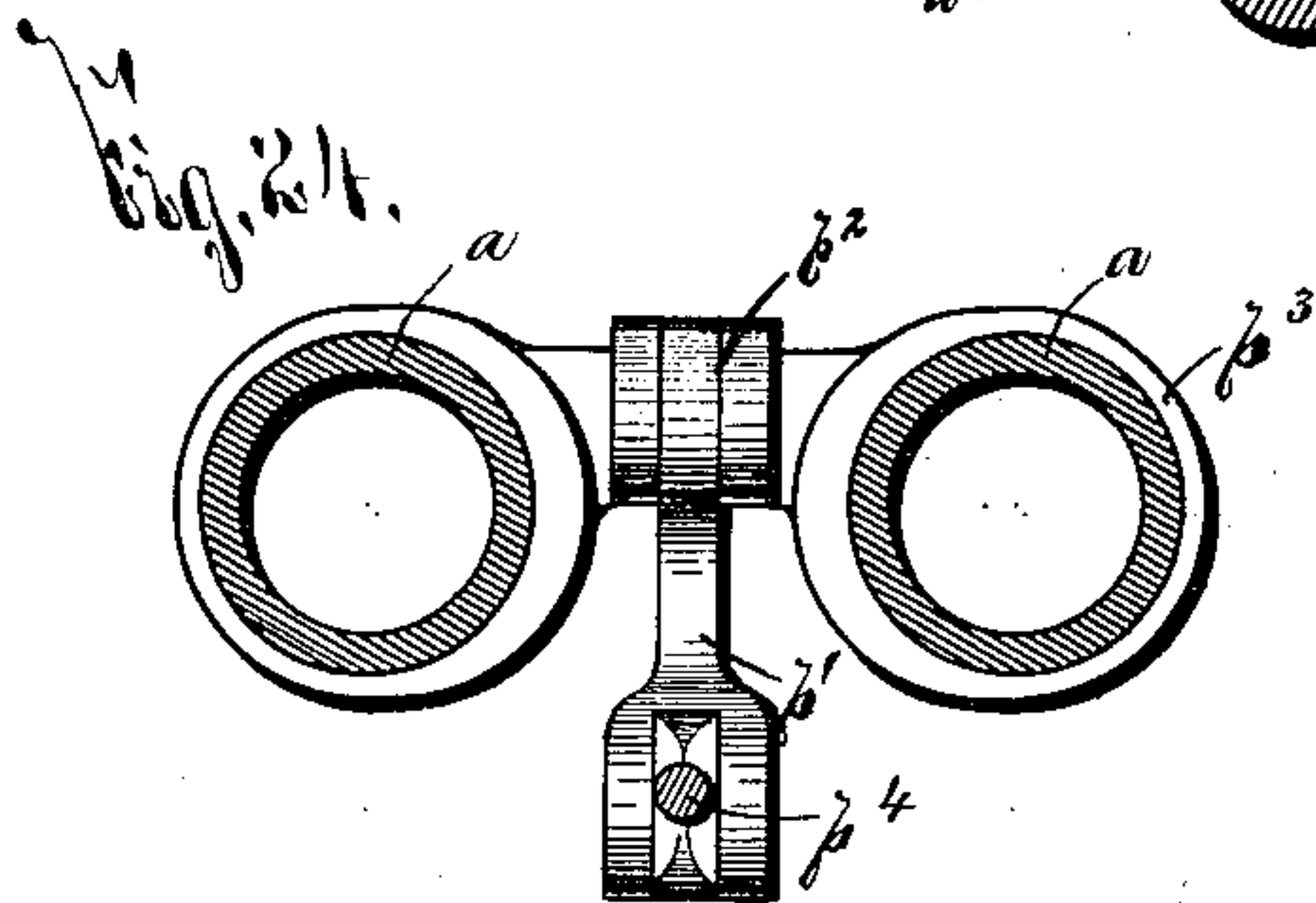
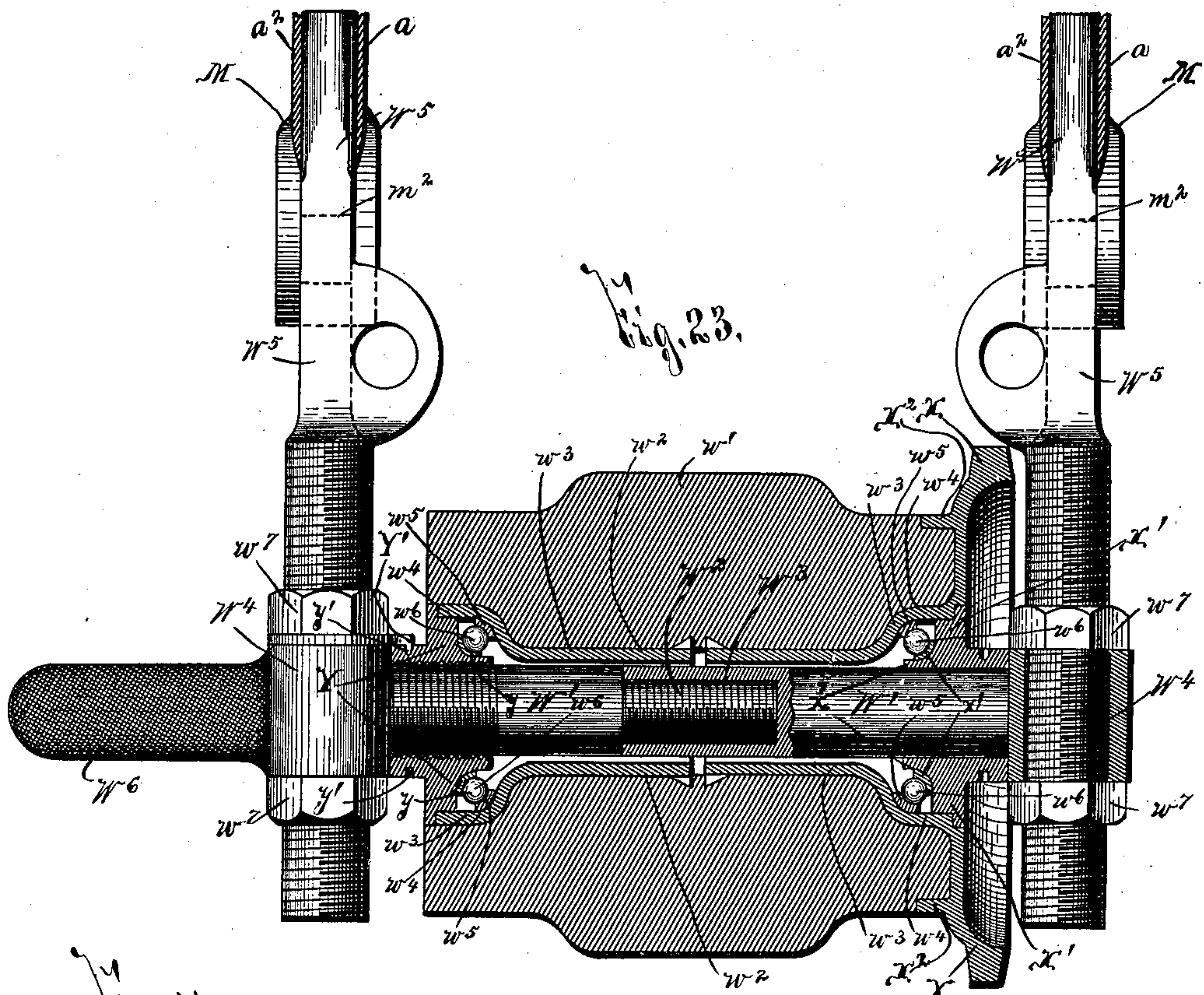
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H. LA CASSE.  
BICYCLE.

No. 518,411.

Patented Apr. 17, 1894.



WITNESSES:

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INVENTOR

BY

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*Henry La Casse*  
*Henry Wilkinson & Co.*



# UNITED STATES PATENT OFFICE.

HENRY LA CASSE, OF ROCHESTER, NEW YORK.

## BICYCLE.

SPECIFICATION forming part of Letters Patent No. 518,411, dated April 17, 1894.

Application filed September 16, 1891. Renewed November 5, 1892. Serial No. 451,023. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY LA CASSE, of Rochester, in the county of Monroe, in the State of New York, have invented new and useful Improvements in Bicycles, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to improvements in bicycles, and has for its object the production of a simple and effective device, which is economically produced, and is extremely easy in use, obviating the customary jar experienced when passing over rough surfaces; and to this end it consists, essentially, in a frame having front and rear wheels, a front fork, a link between the lower end of the fork and the front axle, a movable support for the pedal shaft hinged to the frame, and a seat supporting frame carried by the pedal shaft support whereby both the seat and the pedal move with the same vibration.

The invention also consists in the detail construction and arrangement of the parts of my bicycle, all as hereinafter more fully described and pointed out in the claims.

In describing this invention, reference is had to the accompanying drawings, forming a part of this specification, in which, like letters indicate corresponding parts in all the views.

Figure 1 represents a side elevation of my improved bicycle illustrating the general construction and arrangement of its parts. Fig. 2 is an enlarged elevation, partly in section, of the detached frame, portions thereof being broken away for the purpose of increasing the scale. Fig. 3 is a longitudinal vertical sectional view of the steering rod and a portion of the front fork. Figs. 4 and 5 are detail views illustrating the construction of the handle bar sections and the arm or lever secured thereto for operating the brake. Fig. 6 is an isometric perspective of the detached plate secured to the front fork for supporting one of the levers of the brake actuating mechanism and the forward end of the front mud guard. Fig. 7 is an inverted plan view of the front bracket in which the steering rod is journaled. Fig. 8 is a transverse sectional view, taken on line —8—8—, Fig. 1. Fig. 9

is an elevation of the detached lower end of the front fork and the link for connecting the same to the front axle. Fig. 10 is an elevation of the inner face of the detached link shown at Fig. 9. Figs. 11 and 12 are elevations of the detached brake shoe, its support, and a portion of its actuating mechanism, the shoe being shown in its inoperative position at Fig. 11, and as in its operative position at Fig. 12. Fig. 13 is a horizontal sectional view, taken on line —13—13—, Fig. 2. Figs. 14, 15 and 16 are isometric perspectives of the detached parts of the knuckle between the movable pedal shaft and the frame, and the support for said knuckle. Fig. 17 is a sectional view, taken on line —17—17—, Fig. 1, representing the relative construction and arrangement of the parts mounted on the pedal shaft. Fig. 18 is a transverse sectional view, taken on line —18—18—, Fig. 1, illustrating the clip for adjusting the tension of the springs for supporting the pedal shaft. Figs. 19 and 20 are respectively front elevation and top plan view of the bracket for supporting the forward end of the rear mud guard, a portion of the frame bars being shown as in operative position at Fig. 20. Figs. 21 and 22 are respectively top plan and side elevation of a detached portion of the frame bars and the rear support for the rear mud guard. Fig. 23 is a horizontal sectional view of the rear axle. Fig. 24 is a transverse sectional view, taken on line —24—24—, Fig. 1. Fig. 25 is a transverse sectional view, taken on line —25—25—, Fig. 1, illustrating the clip for supporting the —L— shaped seat supporting the bracket, and Fig. 26 is a transverse sectional view, taken on line —26—26—, Fig. 1.

Bicycles, which are now coming into somewhat general use, are prevented from more extended use by reason of the jar experienced by the rider in passing over rough roads and obstructions. This jar is either transmitted to the rider's hands engaged with the handle bar or directly to his feet and body by the vibration of the pedal shaft. Moreover the rider is usually seated on a yielding seat having more or less movement, and, as his feet are mounted on the pedals secured to a rigidly mounted pedal shaft, great difficulty is



experienced in keeping the feet firmly fixed on the pedals. To obviate this latter difficulty some of the bicycles are provided with a cap or toe piece upon the pedal for engaging the rider's foot.

My invention is rendered particularly easy in operation by a yielding connection between the wheel and the front fork, which prevents the transmission of jar to the handle bar and by mounting the pedal shaft and the seat upon a yielding support, which reduces to a minimum the transmission of jar to the rider's body and feet, and causes said parts to move uniformly and simultaneously.

—A— represents the frame of my bicycle composed preferably of a pair of similarly arranged bars or tubes —a— having their front extremities bent upwardly at —a'— and approximated a greater distance than the rear extremities —a<sup>2</sup>—. The front bracket —B— is adapted to support the steering rod —C—, and is formed with a rearwardly extending arm —b— having sockets —b'— in which the front ends of the frame bars —a—a— are suitably secured as by brazing. The outer sleeve —D— for the lower end of the steering rod —C— is adapted to receive at its lower end the upwardly projecting nipple —e— rigidly secured to the front fork —E—. This sleeve —D— is formed with a bearing face —d— between which and a like bearing face —b<sup>2</sup>— on the front bracket —B— are interposed anti friction balls —D'— for reducing to a minimum the friction effected when turning the steering rod —C—. The upper end of the outer sleeve —D— is also formed with a roller bearing —d'— between which and a corresponding bearing —b<sup>3</sup>— on the upper end of the bracket —B— are interposed anti friction balls —D<sup>2</sup>—, and the said upper extremity is further supported by a nut —D<sup>3</sup>— screwing upon the sleeve —D— and formed with a depending flange —D<sup>4</sup>— adapted to cap over the upper end of the bracket —B—. The extreme upper end of the sleeve —D— is slightly tapered and is slotted at —d<sup>2</sup>—, and screwing thereupon is a nut —d<sup>3</sup>—, which is formed with a slightly tapering inner periphery and clamps the separate sections of said extreme upper end of the sleeve —D— against the periphery of the steering rod —C— inserted within said sleeve.

At the extreme upper end of the steering rod —C— is a cap formed with upturned ears —f— through which is passed the handle bar —F'— consisting of separate sections having their adjacent extremities provided with oppositely turned threads and engaged with a socket —f'— in the lever —f<sup>2</sup>— presently described, in connection with the brake mechanism; said oppositely threaded ends being held in position by a pin —F<sup>2</sup>— passed through an aperture in said lever, and a corresponding aperture in the handle bar formed by a groove in the adjacent faces of its separate sections. The opposite arms —e'— of the

fork —E— are arranged on opposite sides of the front wheel —G—.

As preferably constructed the front wheel is formed with a wooden hub —g— and staggered spokes —g'—, the hub being formed with a central aperture —g<sup>2</sup>— in which are rigidly secured the opposite metallic sections —g<sup>3</sup>—g<sup>3</sup>— having their outer ends formed flaring and provided with ball bearing seats —g<sup>4</sup>—. The front axle —H— is of considerably less diameter than the sections —g<sup>3</sup>—, and is supported in position by means of anti friction balls —h— interposed between the bearings —g<sup>4</sup>— and corresponding bearings —h'— secured to the axle —H—, or, as illustrated, to the inner face of the hub —I'— formed on the links —I— for yieldingly supporting the lower ends of the fork arms —e'— upon said front axle. The upper ends of the links —I— are formed on their inner face with a recess —i— having inner and outer flanges —i'— and —i<sup>2</sup>— in which is mounted a spring —I<sup>2</sup>— having one end —i<sup>3</sup>— secured to the link, and the other —i<sup>4</sup>— to the lower end of the fork arms —e'—. These lower ends of the fork arms are formed with a hub —e<sup>2</sup>— movable in a slot —I<sup>5</sup>— in the outer flange —i<sup>2</sup>— and with a hollow boss —e<sup>3</sup>— journaled within the inner flange —i'— of the link —I— and secured in position by a suitable clamp as a nut and bolt —I<sup>3</sup>—. The hub —I'— of the links —I—, which, as previously stated, is formed with the ball bearing face —h'—, is rigidly secured to the axle —H—, being preferably screwed thereon and held in position by a locking nut —H'—, the end of the shaft —H— being formed with a slot —H<sup>2</sup>— for enabling the same to be firmly held when the nut —H'— is screwed in position.

In the use of my bicycle the spring —I<sup>2</sup>— constantly forces the front face of the fork arms —e'— against the front wall or shoulder —i<sup>6</sup>— of the slot —i<sup>5</sup>—, as best seen at Fig. 2, and, as the wheel encounters an obstruction, the axle moves upwardly against the action of the spring until the rear face of the fork encounters the rear wall or shoulder —i<sup>7</sup>— of the slot, which can only happen when the wheel is excessively jarred so as to entirely overcome the force of the spring —I<sup>2</sup>—. The fork and its flexible connection reduce to a minimum the amount of jar ordinarily transmitted to the handle bar and render the riding of the bicycle much more pleasurable and healthful than when the same is continually jarred by passage over obstacles.

—J— represents any suitable construction of front mud guard, which may be suitably supported, as by means of a suitable brace —J'— and downwardly projecting ears —j— upon a support —j'— for one of the brake actuating levers, presently described.

—K— is the pedal shaft, which is yieldingly mounted on a knuckle —L— and a link —M—, and is held in position by an upper spring —R— and a lower spring —S—.



As best seen at Figs. 1, 2, 11, 12, 14, 15, and 16, the knuckle —L— consists of a pair of levers —L<sup>1</sup>— and —L<sup>2</sup>— having their adjacent extremities formed with eyes —l<sup>1</sup>—l<sup>2</sup>— hinged together by a pin —l<sup>3</sup>—, the free end of the lever —L<sup>1</sup>— being formed with eyes —l<sup>4</sup>— and hinged to corresponding eyes —l<sup>5</sup>— on a bracket —L<sup>3</sup>— secured to the frame —A—, and the free end of the lever —L<sup>2</sup>— being formed with eyes —l<sup>6</sup>— hinged to corresponding eyes —l<sup>7</sup>— on the forward arm —l<sup>8</sup>— of a lever —L<sup>4</sup>— journaled on the pedal shaft —K—. The bracket —L<sup>3</sup>— is formed at its upper face with suitable eyes —l<sup>9</sup>— for receiving the opposite frame bars —a—a—, and is preferably brazed thereto. The lever —L<sup>2</sup>—, when in its normal position, extends upwardly and forwardly from the lower arm —l<sup>8</sup>— of the lever —L<sup>4</sup>—, and the lever —L<sup>1</sup>— extends rearwardly from the forward end of said lever —L<sup>2</sup>—, as best seen at Figs. 1 and 2, thus requiring the smallest possible space for said knuckle, and causing the same to be extremely firm, although capable of instantly yielding to prevent transmission of jar to the rider as more clearly shown hereinafter. The lever —L<sup>4</sup>— is formed with a box or hub —L<sup>5</sup>— through which passes the pedal shaft —K—, and at its free ends is formed with bearing faces —l<sup>10</sup>— against which bear anti friction balls —l<sup>11</sup>— held in position by shoulders —l<sup>12</sup>— and —l<sup>13</sup>—. One of the shoulders —l<sup>11</sup>— is rigidly held in position by a suitable key —l<sup>14</sup>—, and on its outer face is rigidly secured the front sprocket wheel —N—, and on the outer face of the sprocket wheel the hub of the pedal crank —n—. The other shoulder —l<sup>12</sup>— is formed with screw threads, and is adjustable upon the axle —K— for taking up all wear and firmly drawing the parts against the friction balls —l<sup>10</sup>—. On the outer face of this adjustable nut is the opposite pedal crank —n'— having its hub rigidly secured to the axle by a suitable set screw —n<sup>2</sup>—.

Rigidly secured in any suitable manner to the rearwardly extending arm —l<sup>14</sup>— of the lever —L<sup>4</sup>— is the link —M— consisting preferably of two parallel tubes —m—m— having their forward ends capping over said arms —l<sup>14</sup>— and their rearward ends capping over nipples on a support —m'— hinged at —m<sup>2</sup>— to a support —W<sup>5</sup>— upon the rear axle —W—.

Extending upwardly from the hinge point of the levers —L<sup>2</sup>— and —L<sup>4</sup>— is an arm —O— having a projecting shoulder —o— adapted to be engaged by the rear end of the spring —R— for yieldingly supporting the pedal shaft. The forward end of this spring rests upon a movable adjuster or clamp —O'—, and is rigidly secured in any suitable manner as by brazing to a shoulder —o'— upon the rearwardly extending arm —b— of the front bracket —B— previously described. The lower spring —S— is arranged with its rear end beneath the hinge point of said le-

vers —L<sup>2</sup>— and —L<sup>4</sup>—, and its upper end also bears upon the clamp —O'— and is rigidly secured to shoulders —O<sup>2</sup>— on the arm —b— of the bracket —B—. The clamp —O'—, is moved lengthwisely of the frame bar a' for adjusting the springs R and S, and as best seen at Fig. —18—, consists of an upper plate —o<sup>3</sup>— having a bearing —o<sup>4</sup>— for the upper spring —R—, a lower plate —o<sup>5</sup>— having a bearing face —o<sup>6</sup>— for the lower spring —S—, curved bearing faces —o<sup>7</sup>— on the inner faces of the opposite extremities of said plates for engaging the upper end of the frame bars —a—a—, and a suitable clamping screw —o<sup>8</sup>— for drawing said plates together and clamping the support —O'— in position. It will readily be apparent from the foregoing that, when the wheels strike an obstruction and raise the frame, the pedal shaft remains in substantially its previous position without being jarred, as upon the elevation of the frame the knuckle —L— opens out against the action of the springs —R— and —S—, and the link —M— swings on its pivot —m<sup>2</sup>—.

—T— represents any suitable construction of seat; —t— a pin or other suitable support upon which said seat is secured by a suitable clamp —T'—; —t'— a clamp for securing the pin —t— to spring bars —u<sup>2</sup>— presently described, and —U— the seat supporting frame of my improved bicycle. This frame —U— consists of a pair of front tubes —u—u— brazed to a pair of projecting nipples —O<sup>2</sup>— on the arm —O—, a pair of rear tubes —u'— brazed to a corresponding pair of nipples —w— upon the support —W<sup>5</sup>— secured to the rear axle; and a pair of spring connecting bars —u<sup>2</sup>—u<sup>2</sup>—. The forward ends of the bars —u<sup>2</sup>—u<sup>2</sup>— are hinged at —u<sup>3</sup>— to the front frame bars —u—u—, and are formed at their rear extremity with the coils —u<sup>4</sup>— and with the projecting ends —u<sup>5</sup>— adjustably mounted within the hollow rear bars —u'— and secured in position by screws —u<sup>6</sup>— carried by a cap —u<sup>3</sup>— rigidly secured on the rear frame bars —u'—u'—.

—V— represents the rear mud guard, which is formed comparatively stiff in order to add to the rigidity of the frame, its forward end being secured to a bracket —v— rigidly secured to the frame bars —a—a— and its rearward end to the cap —u<sup>8</sup>— upon the spring frame bars —u'—u'—. The rear wheel —W— is also formed with a wooden hub —w'— having a central cavity —w<sup>2</sup>— in which are rigidly secured sleeves or linings —w<sup>3</sup>— having flaring ends —w<sup>4</sup>— provided with bearing faces —w<sup>5</sup>— for anti friction balls —w<sup>6</sup>—. Passed through these sleeves —w<sup>3</sup>— is the rear axle —W'— composed preferably of two sections firmly secured together, one being formed with a screw threaded nipple —W<sup>2</sup>— and the other with a screw threaded socket —W<sup>3</sup>—. The extremities of the axle extend beyond the hub —w'—, and are formed with eyes —W<sup>4</sup>— in which are adjustably mounted, by means of clamping nuts —w<sup>7</sup>—, the



supports or arms —W<sup>5</sup>— carrying the link —M— for the treadle axle, and the rear seat supporting frame bars —u'—u'. The rear sprocket wheel —X— is rigidly secured to the adjacent sleeve —w<sup>3</sup>— and is engaged by a nut —X'— formed with an inwardly extending hub —x— having a bearing face —x'— for the adjacent anti friction balls —w<sup>6</sup>—, and is also formed with a flange —X<sup>2</sup>— on the outside of the hub —w'. Upon the opposite section of the axle is adjustably mounted a shoulder —Y— having a bearing face —y— for the anti friction balls —w<sup>6</sup>— and formed with a series of apertures —y'— with which is engaged a suitable stop —Y'— for preventing the retraction of said shoulder.

It will be readily noted that, by means of the nuts —w<sup>7</sup>— the supports —W<sup>5</sup>— may be readily adjusted for taking up all slack in the sprocket chain —X<sup>3</sup>—.

In order to facilitate mounting of the bicycle one extremity of the rear axle is extended outwardly and formed with a foot engaging portion —W<sup>6</sup>—.

The brake mechanism —P— consists of a suitable shoe —P'— journaled on the hub —L<sup>5</sup>— of the pedal supporting lever —L<sup>4</sup>—, and suitable connections between the upper extremity of said shoe and the lever —f<sup>2</sup>— secured to the handle bar —F'. As preferably constructed these connections consist of a lever —p'— pivoted at —p<sup>2</sup>— to a support —p<sup>3</sup>— upon the frame —A—, and connected by a link —p<sup>4</sup>— passed through the arm —O— to the brake shoe —P'— a lever —p<sup>5</sup>— pivoted to a lug —p<sup>6</sup>— on the rear arm —b— of the front bracket —B—, and connected to the lever —p'— by a link —p<sup>7</sup>— passed through the spring —S— and a third lever —p<sup>8</sup>— pivoted to the support —j'— previously described, and connected by a horizontally jointed link —p<sup>9</sup>— to the lever —p<sup>5</sup>— and by a link —p<sup>10</sup>— to the end of the lever —f<sup>2</sup>—. The upper end of the link —p<sup>10</sup>— passes through an opening in the arm —p<sup>11</sup>— of the cap —F— upon the steering rod, and the spring —P<sup>2</sup>— interposed between said arms —p<sup>11</sup>— and a shoulder —p<sup>12</sup>— on the link —p<sup>10</sup>— constantly forces said link —p<sup>10</sup>— downwardly and throws the shoe out of engagement with the rear wheel —W—.

When desired to utilize the brake the rider bears downwardly in a natural movement of strongly gripping the handle bar when danger is apparent, and the connections between the brake shoe and the lever —f<sup>2</sup>— secured to said handle bar force the brake shoe firmly against the rear wheel against the action of the spring —P<sup>2</sup>—. This forms a particularly simple and effective style of brake, and is an essential feature of my invention.

The operation of my invention will be readily perceived from the foregoing description and upon reference to the parts. It will be particularly noted that the handle bar is almost entirely prevented from jar, and that, when the frame is jarred, this motion is not

transmitted to the rider, as both his feet and his body are supported yieldingly upon the frame by means of the yielding support for the treadle shaft and the seat supporting frame, which is carried upon the support for the treadle shaft.

It will be understood that the detail construction and arrangement of the parts of my invention may be somewhat varied from those shown and described without departing from the spirit thereof, hence I do not herein limit myself to such detail construction and arrangement.

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

1. The combination of a fork, a wheel having an axle, a link having one extremity secured to the axle and having a recess in its opposite extremity provided with a slot in its side wall for receiving the adjacent end of the fork, and a spring mounted in said recess in the link between the inner wall of the recess and the adjacent face of the fork and having one end connected to the link and the other to the fork, substantially as and for the purpose set forth.

2. The combination of a frame and a steering rod, a cap at the extremity of said rod provided with a pair of ears, a lever interposed between said ears and formed with a threaded socket, a handle bar composed of separable extremities having their adjacent ends screw threaded and passed through said socket, and a lock for preventing turning of said handle bar extremities, substantially as and for the purpose set forth.

3. The combination of a frame, a steering rod provided at its upper end with a projecting shoulder fixed thereto and with upwardly projecting ears, a handle bar journaled in said ears for operating the steering rod, a brake-shoe hinged to the frame, a lever p<sup>8</sup> pivoted to said frame, a jointed connection p<sup>9</sup> hinged to the lever p<sup>8</sup> and connected, substantially as described, to the brake-shoe, a lever f<sup>2</sup> having one end rigidly secured to the handle bar and the other projecting outwardly beyond the steering rod, a link having one end pivoted to the lever p<sup>8</sup> and the other to the projecting end of the lever f<sup>2</sup> and provided with a spring engaging shoulder, and a spring interposed between the projecting shoulder on the steering rod and the spring engaging shoulder on said link, substantially as and for the purpose specified.

4. The combination of a frame, a pedal shaft, a knuckle K interposed between the pedal shaft and the frame and comprising levers pivoted to each other and also to the pedal shaft and to the frame, a spring for supporting said knuckle in its normal position, and a seat connected to said knuckle, substantially as and for the purpose set forth.

5. The combination of a frame, a pedal shaft, a knuckle K interposed between the pedal shaft and the frame and comprising levers



pivoted to each other and also to the pedal shaft and to the frame, a spring for supporting said knuckle in its normal position, a seat connected to said knuckle, and an adjuster for adjusting the tension of said spring, substantially as described.

6. The combination of a frame, a pedal shaft, a knuckle K interposed between the pedal shaft and the frame and comprising levers pivoted to each other and also to the pedal shaft and to the frame, a spring for supporting said knuckle in its normal position, a link having one end hinged to the pedal shaft and the other to the rear portion of the frame, and a seat connected to said knuckle, substantially as described.

7. The combination of a frame, a seat, a seat support, a knuckle joint between the frame and the seat support, a spring secured to said frame and to said seat support, and an adjuster for adjusting the tension of the spring, substantially as and for the purpose specified.

8. The combination of a frame, a lever L' having its rear end hinged to the frame, a lever L<sup>2</sup> arranged beneath the lever L' and having its front end hinged to the corresponding end of the lever L', a pedal shaft, a lever L<sup>4</sup> having the pedal shaft journaled therein and having its front end hinged to the rear end of the lever L<sup>2</sup>, a spring connected, substantially as described, to said levers for supporting the same in operative position, and a seat connected to said levers, substantially as specified.

9. The combination of a frame, a lever L' having its rear end hinged to the frame, a lever L<sup>2</sup> arranged beneath the lever L' and having its front end hinged to the corresponding end of the lever L', a pedal shaft, a lever L<sup>4</sup> having the pedal shaft journaled therein and having its front end hinged to the rear end of the lever L<sup>2</sup>, a spring connected, substantially as described, to said levers for supporting the same in operative position, a seat connected to said levers, and a link M having its rear end hinged to the frame and its front end rigidly secured to the rear end of the lever L<sup>4</sup>, substantially as set forth.

10. The combination of a frame, a pair of hinged levers having their corresponding extremities hinged together and the opposite end of one lever hinged to the frame, a seat, a seat support hinged to the opposite end of the other lever, and a spring for holding said levers into operative position, substantially as specified.

11. The combination of a frame, a lever L' having its rear end hinged to the frame, a lever L<sup>2</sup> arranged beneath the lever L' and having its front end hinged to the corresponding end of the lever L', a pedal shaft, a lever L<sup>4</sup>

having the pedal shaft journaled therein and having its front end hinged to the rear end of the lever L<sup>2</sup>, a seat, a seat support having its lower end hinged to the pivotal pin of the levers L<sup>2</sup> L<sup>4</sup>, and a spring connected, substantially as described, to said levers for supporting the same, substantially as described.

12. The combination of a frame, a pedal shaft, a pair of hinged levers having their corresponding extremities hinged together and the opposite end of one lever hinged to the frame and the opposite end of the other lever to said pedal shaft, an upwardly projecting arm secured to the hinge pin of one of said levers and formed with an engaging shoulder, and a spring having one end secured to said frame and the other engaged with said engaging shoulder, substantially as specified.

13. The combination of a frame, a shaft, a knuckle K interposed between the pedal shaft and the frame and comprising levers pivoted to each other and also to the pedal shaft and to the frame, a brake-shoe journaled on one of the levers, a handle bar connected to the brake-shoe, a spring for supporting said knuckle in its normal position, and a seat supported on said knuckle, substantially as and for the purpose set forth.

14. The combination of a frame, a lever L' having its rear end hinged to the frame, a lever L<sup>2</sup> arranged beneath the lever L' and having its front end hinged to the corresponding end of the lever L', a pedal shaft, a lever L<sup>4</sup> having the pedal shaft journaled therein and having its front end hinged to the rear end of the lever L<sup>2</sup>, a brake-shoe journaled on the lever L<sup>4</sup>, a handle bar connected to the brake-shoe, a spring connected, substantially as described, to said levers for supporting the same in operative position, and a seat connected to said levers, substantially as and for the purpose described.

15. The combination of a frame, a rear wheel having an axle, a projecting arm adjustably secured to said axle, a link having one end hinged to the forward end of the arm, a pedal shaft journaled in the front end of the link, a knuckle joint between the pedal shaft and the frame, and a spring for supporting the pedal shaft, substantially as and for the purpose specified.

In testimony whereof I have hereunto signed my name, in the presence of two attesting witnesses, at Rochester, in the county of Monroe, in the State of New York, this 12th day of August, 1891.

HENRY LA CASSE.

Witnesses:

HAMPDEN HYDE,  
GEO. H. HUMPHREY.