

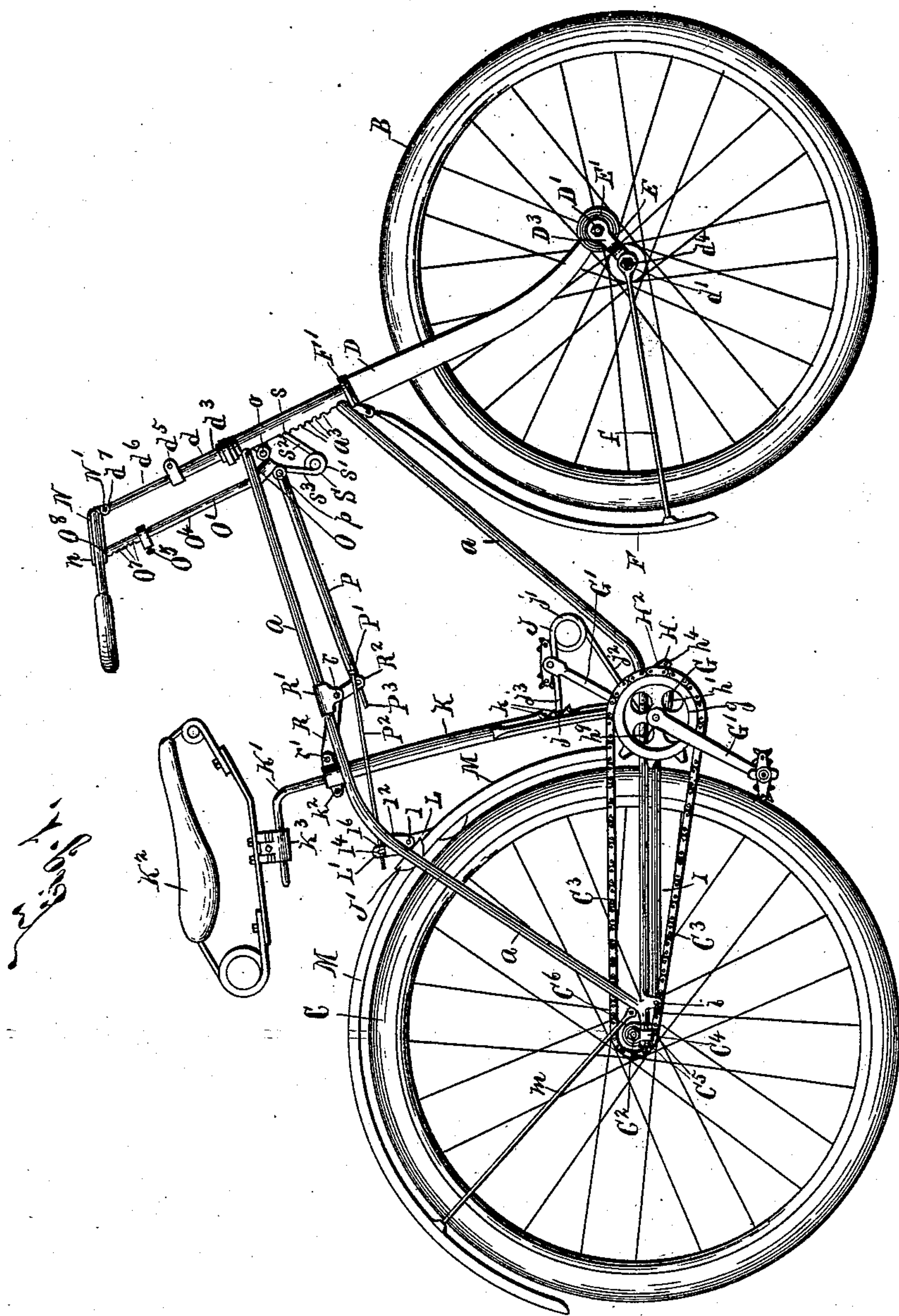
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8 Sheets—Sheet 1.

H. LA CASSE.
BICYCLE.

No. 524,389.

Patented Aug. 14, 1894.



WITNESSES:

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INVENTOR

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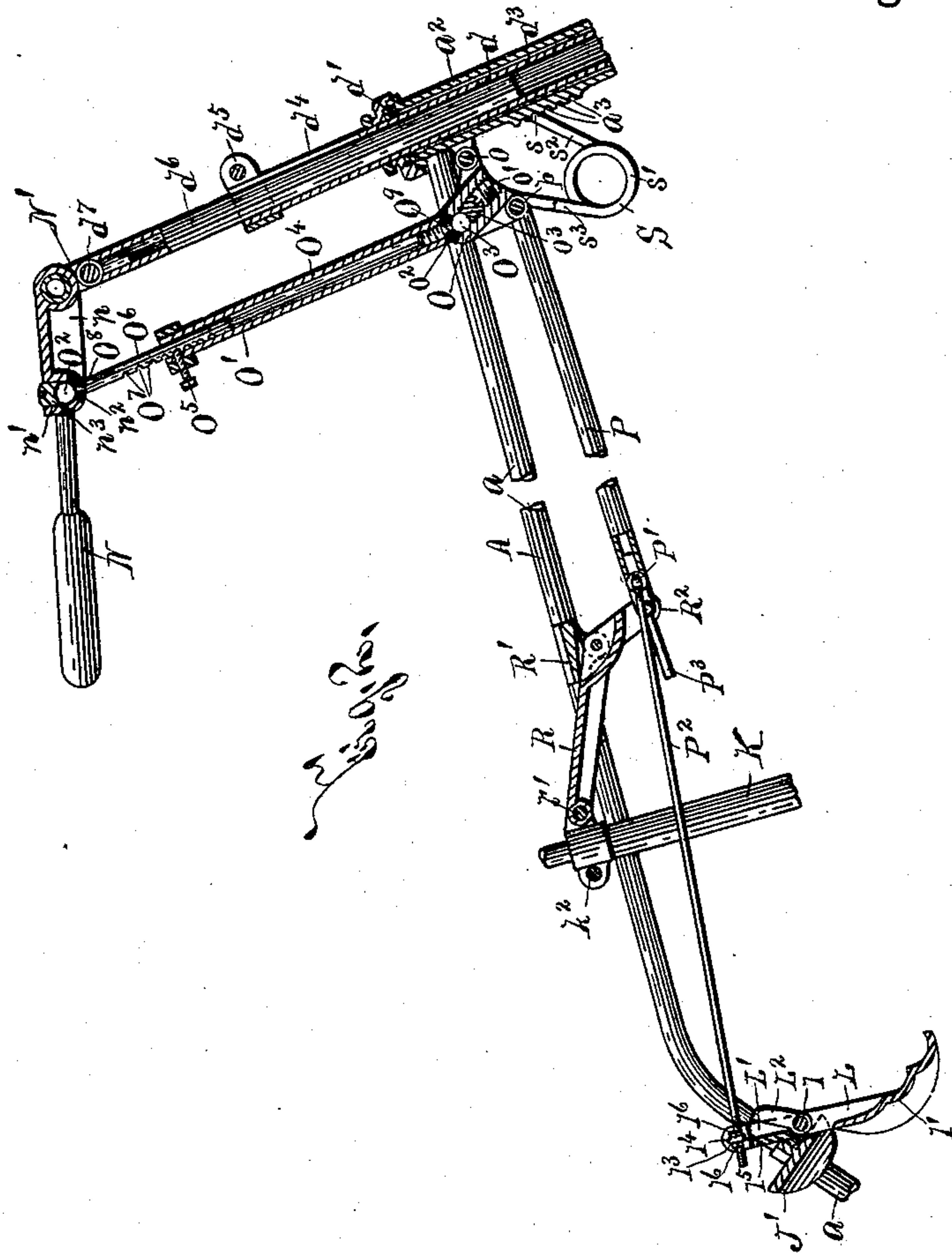
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8 Sheets—Sheet 2.

H. LA CASSE.
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No. 524,389.

Patented Aug. 14, 1894.



WITNESSES:

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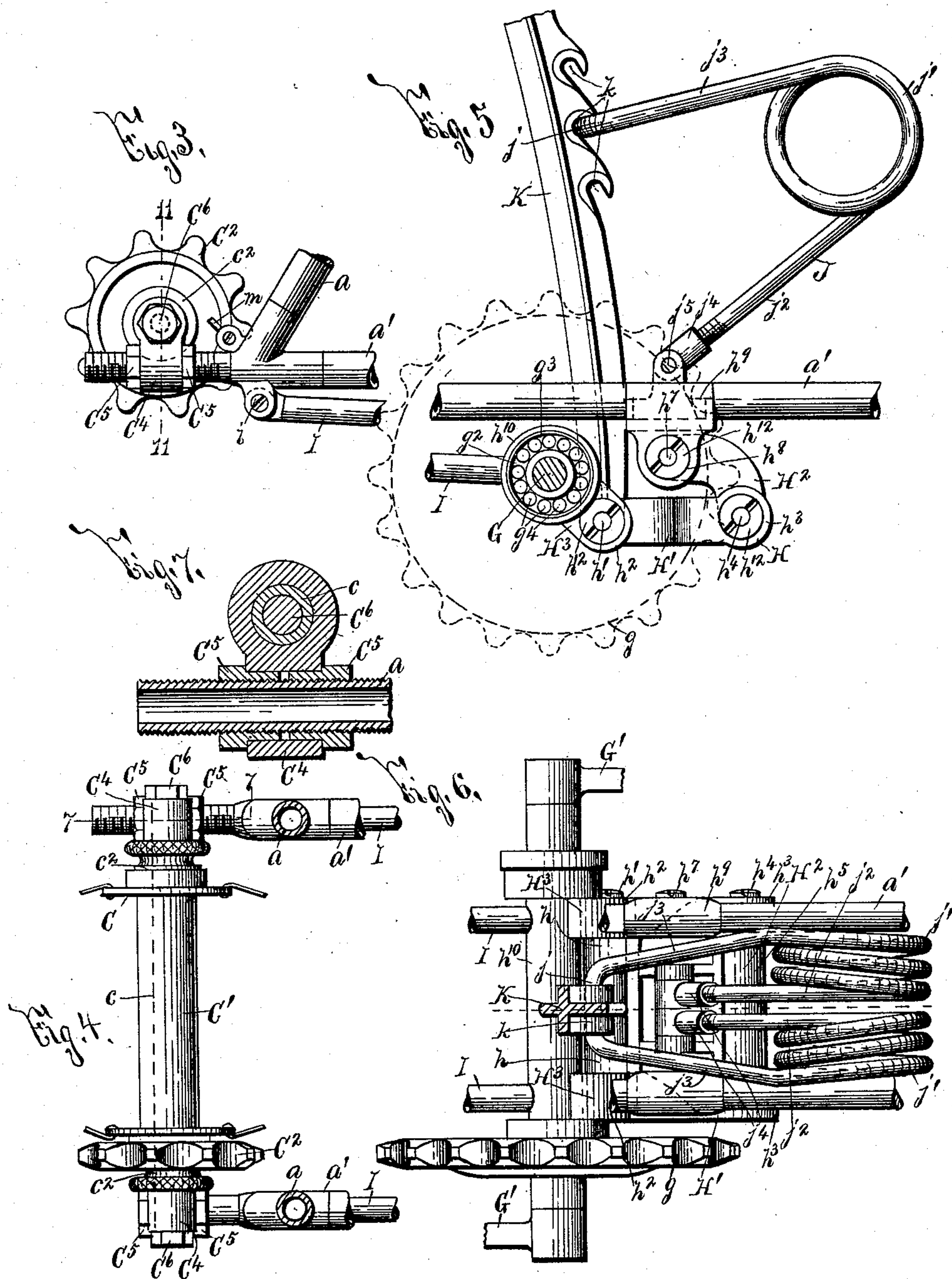
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No. 524,389.

Patented Aug. 14, 1894.



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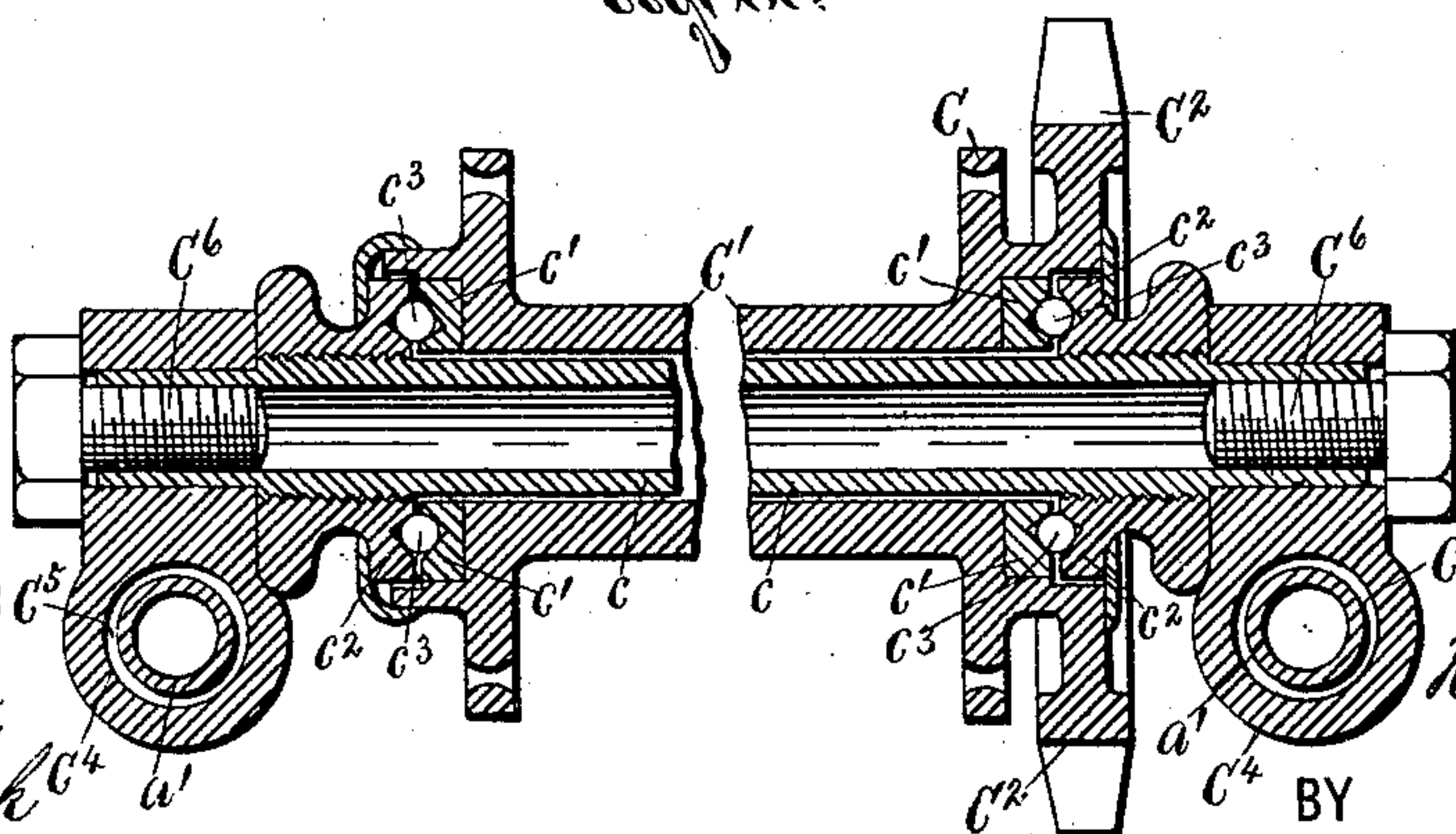
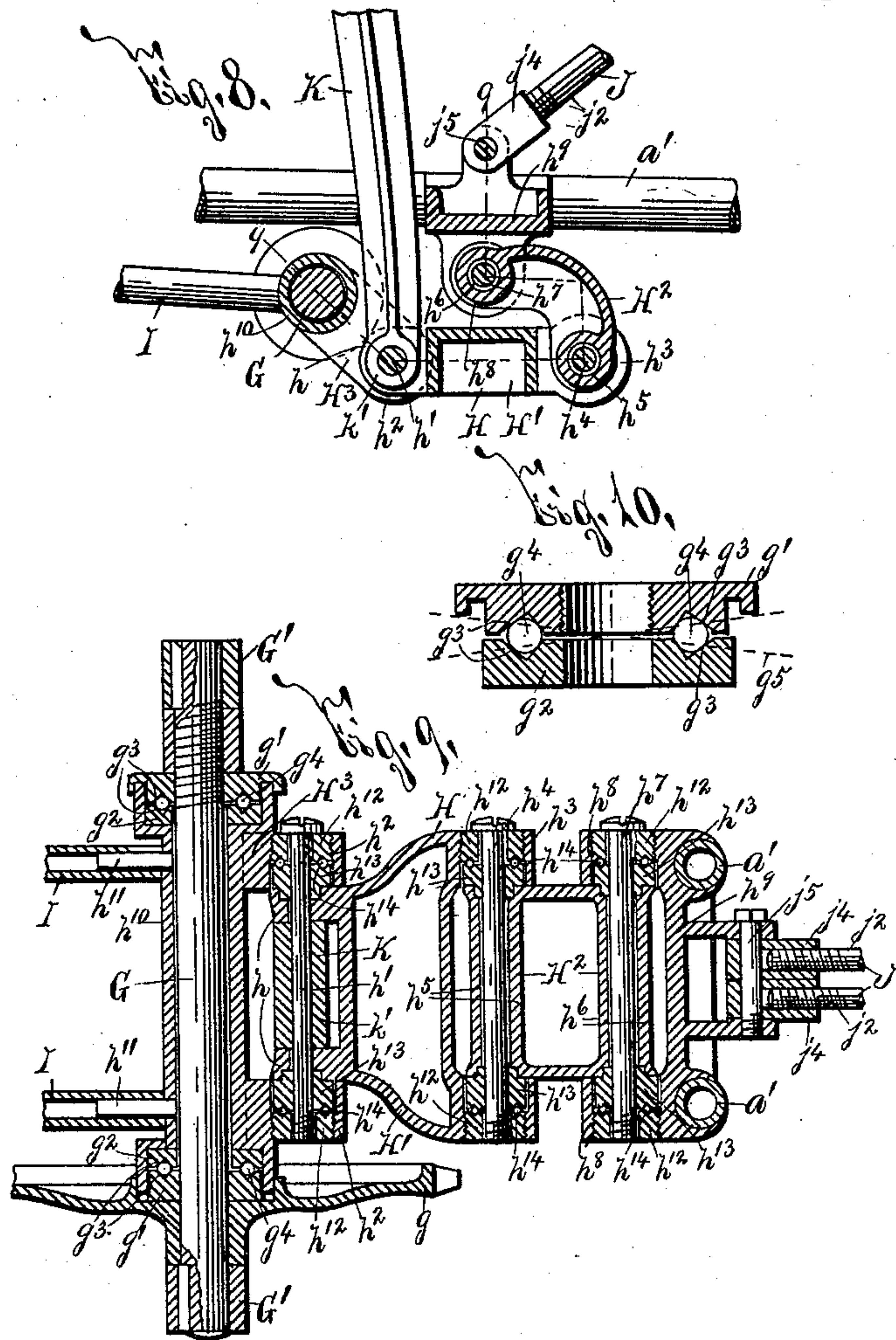
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H. LA CASSE.
BICYCLE.

No. 524,389.

Patented Aug. 14, 1894.



WITNESSES:

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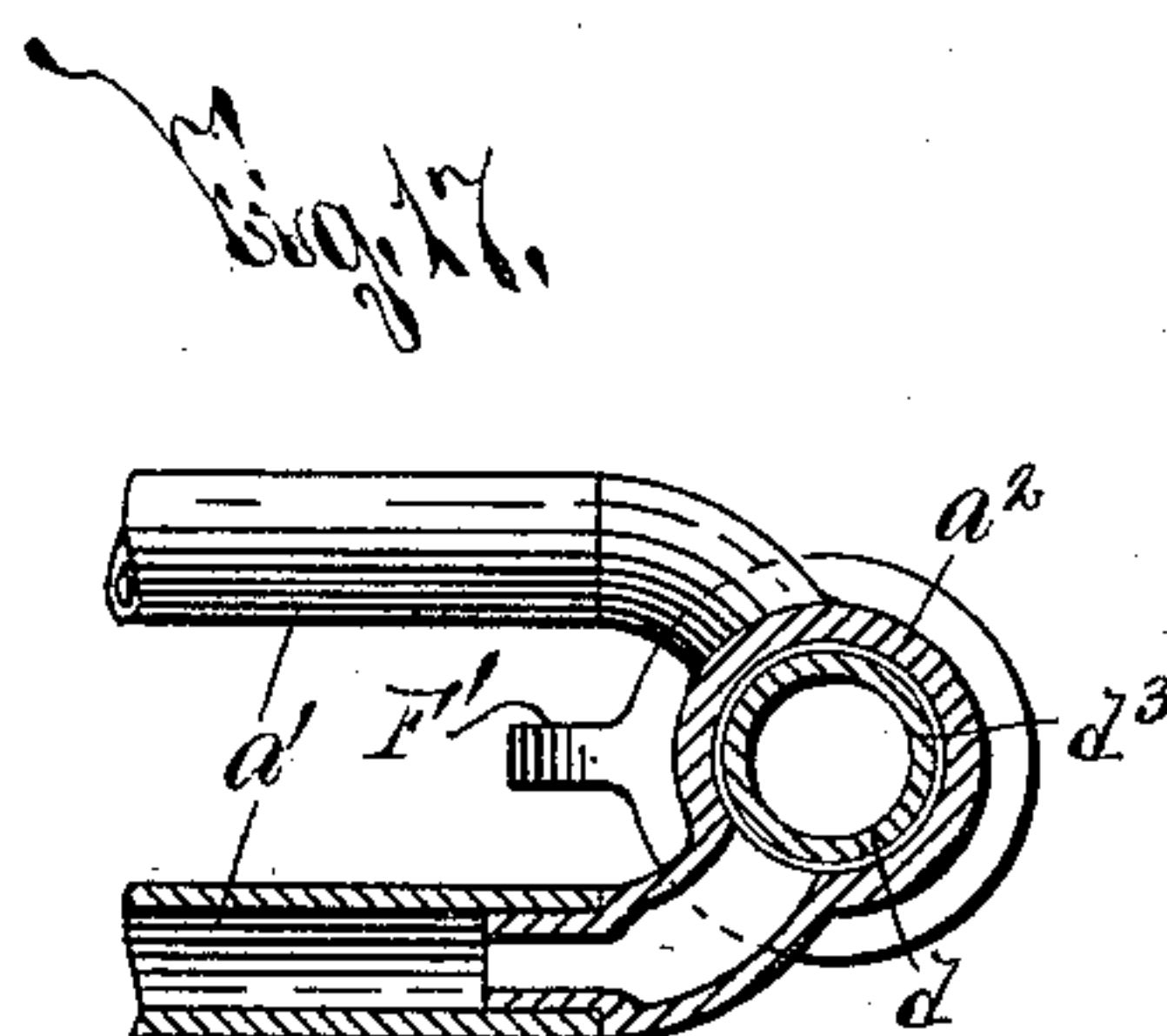
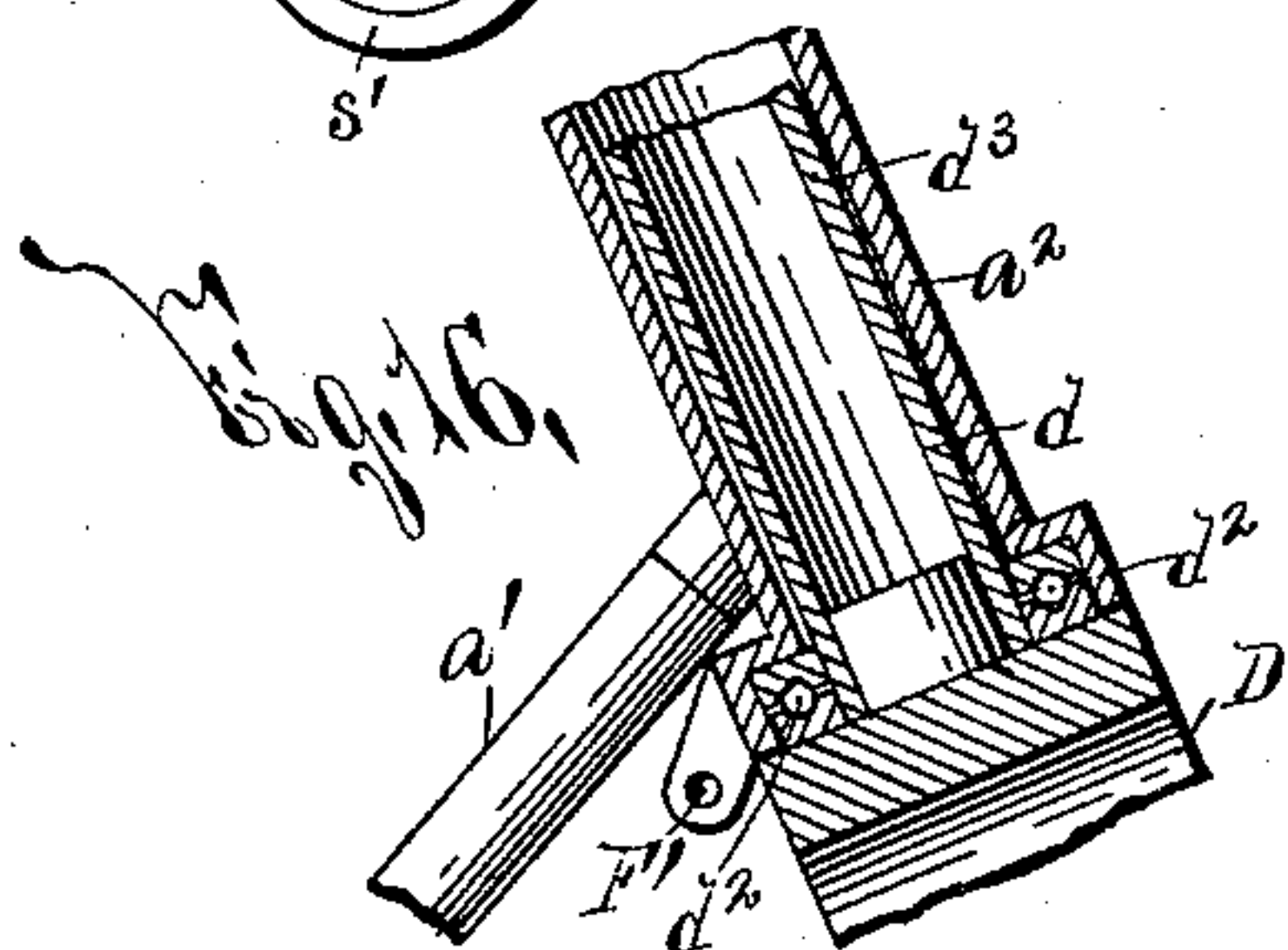
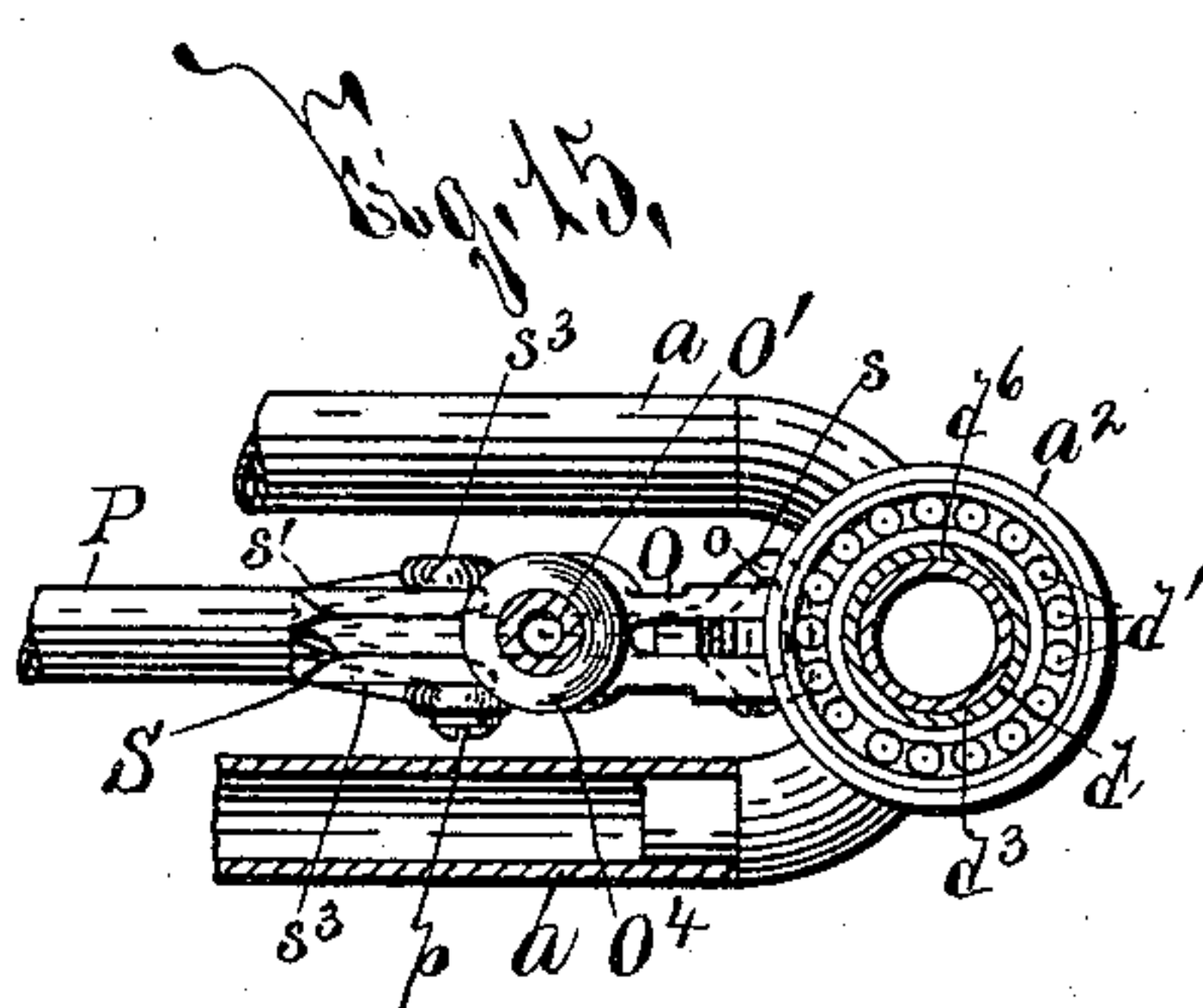
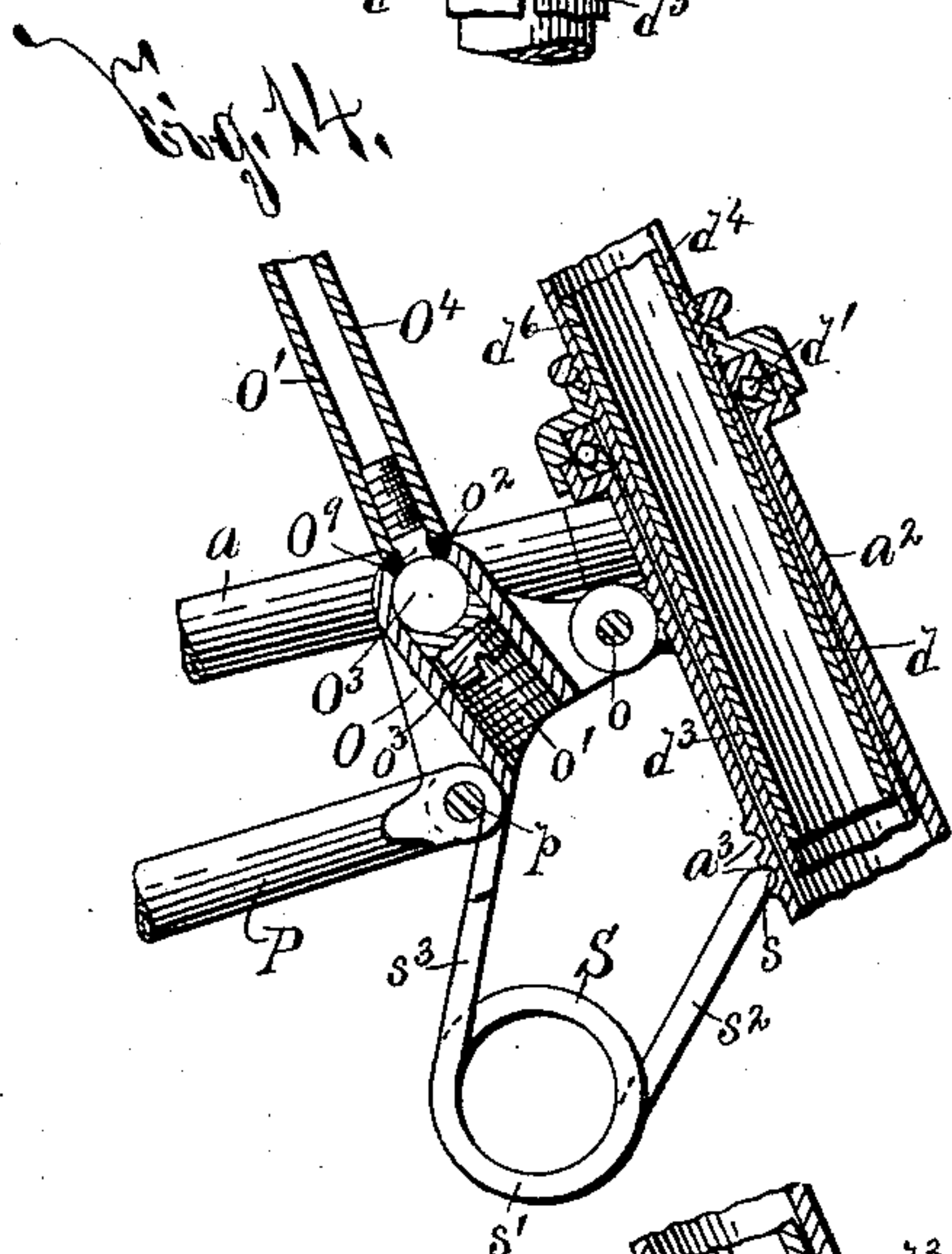
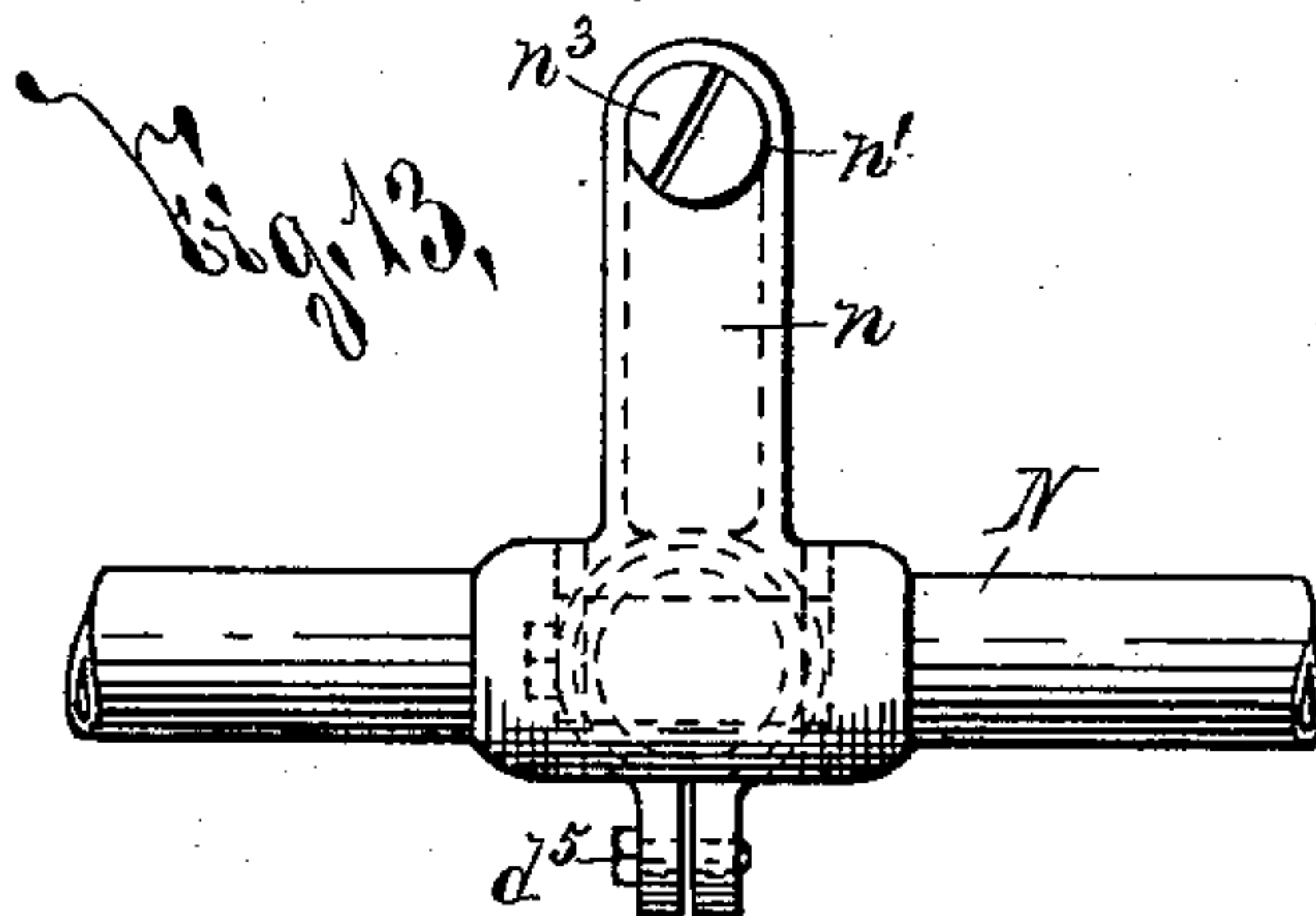
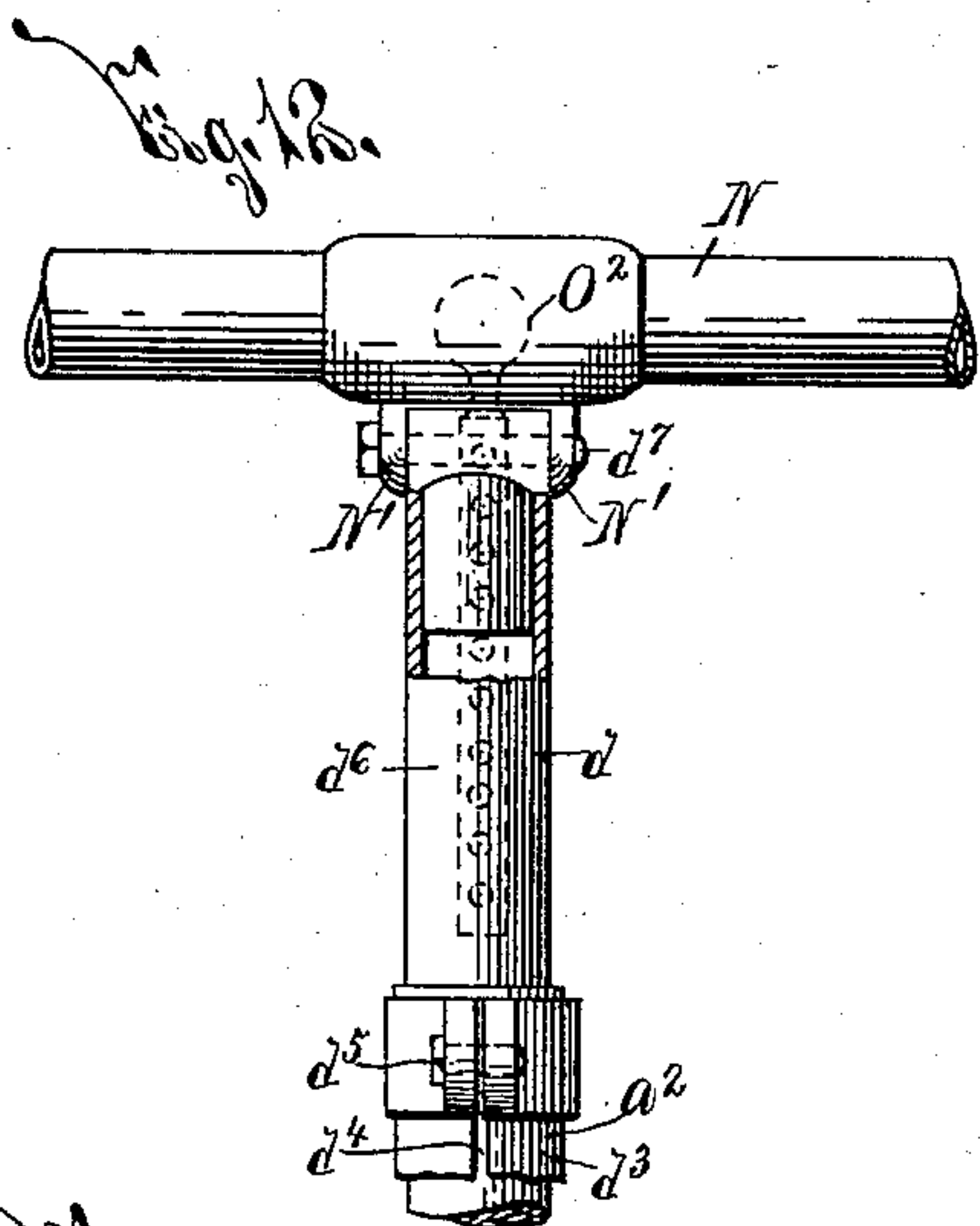
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H. LA CASSE.
BICYCLE.

No. 524,389.

Patented Aug. 14, 1894.



WITNESSES:

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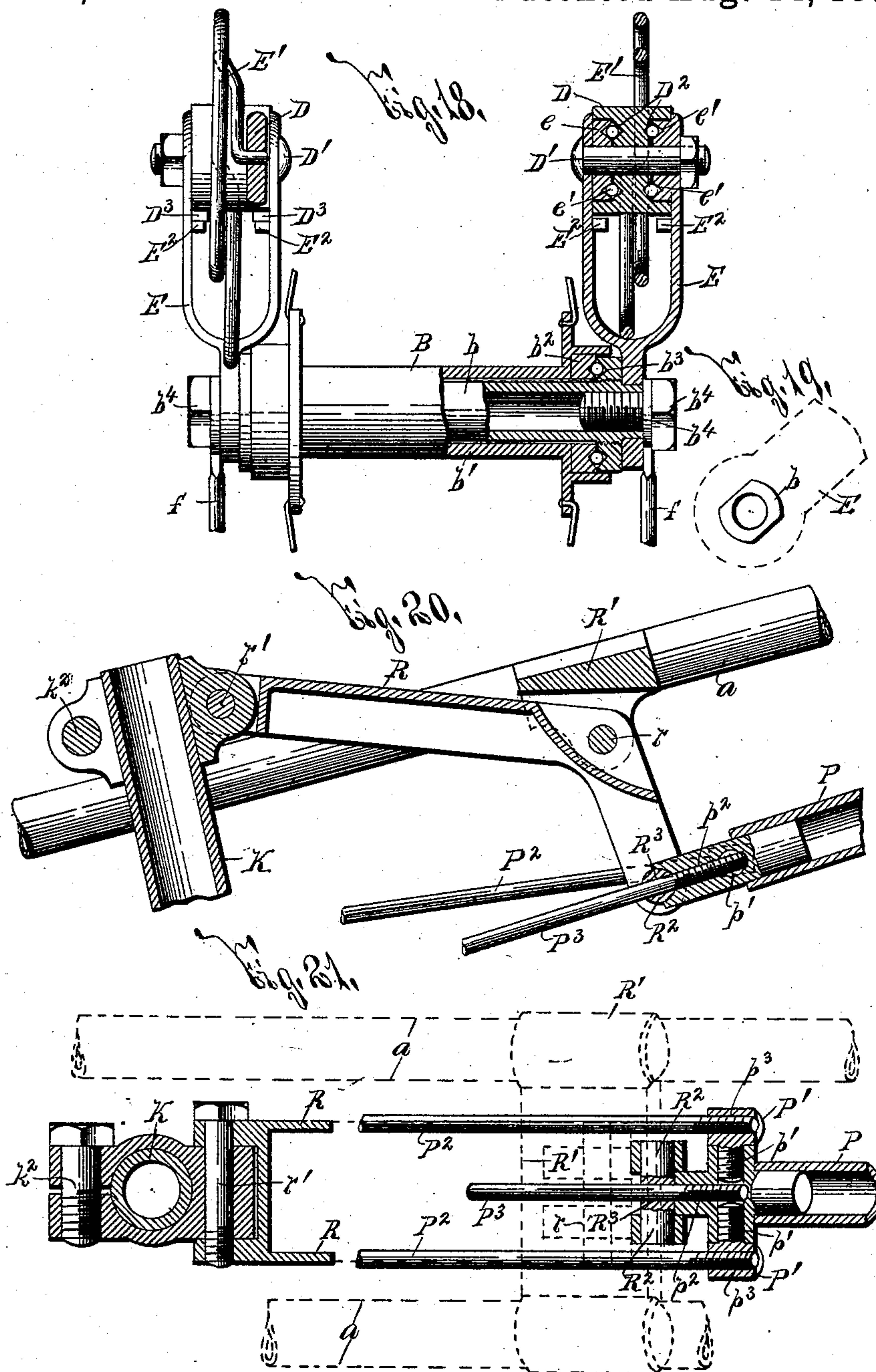
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8 Sheets—Sheet 6.

H. LA CASSE.
BICYCLE.

No. 524,389.

Patented Aug. 14, 1894.



WITNESSES:

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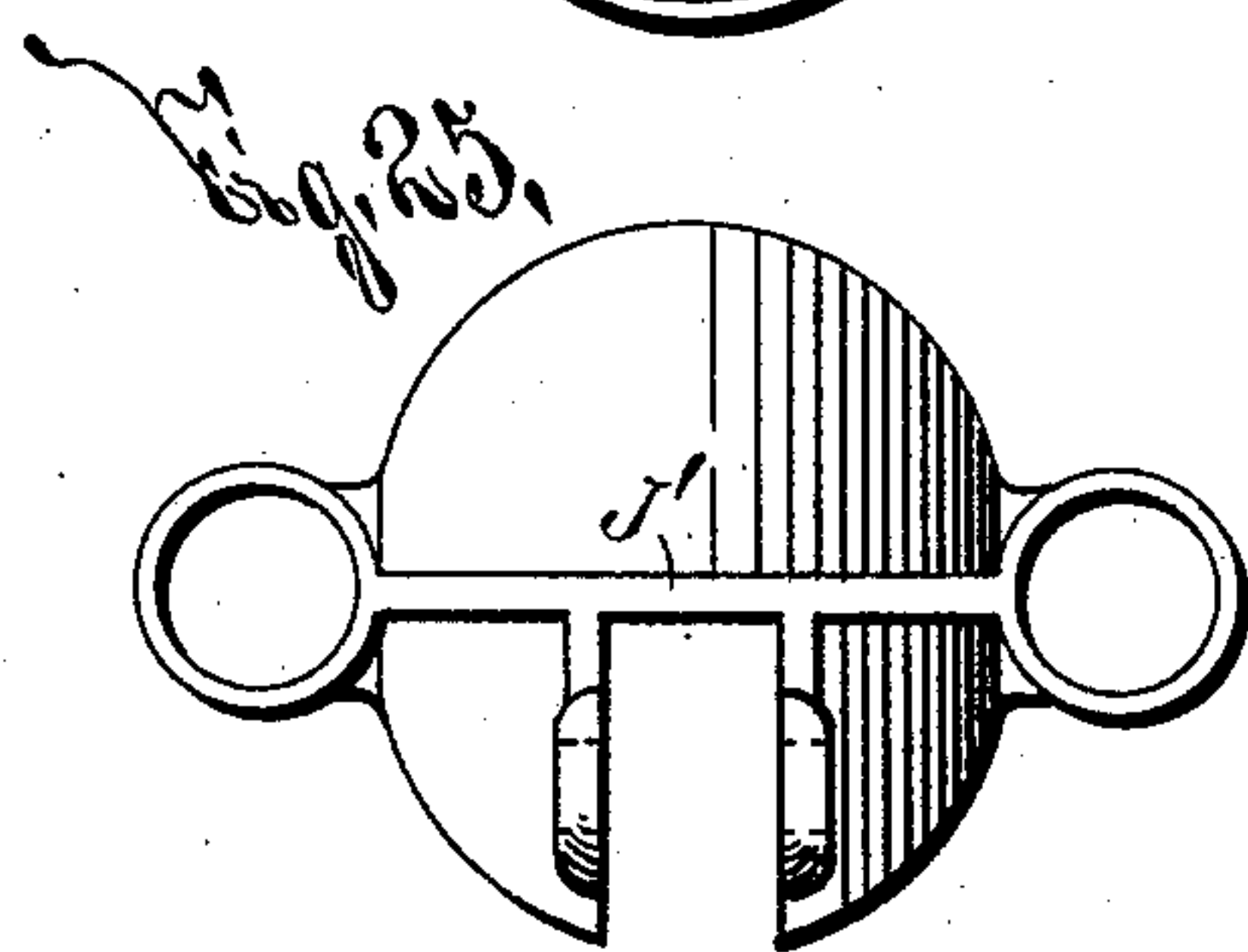
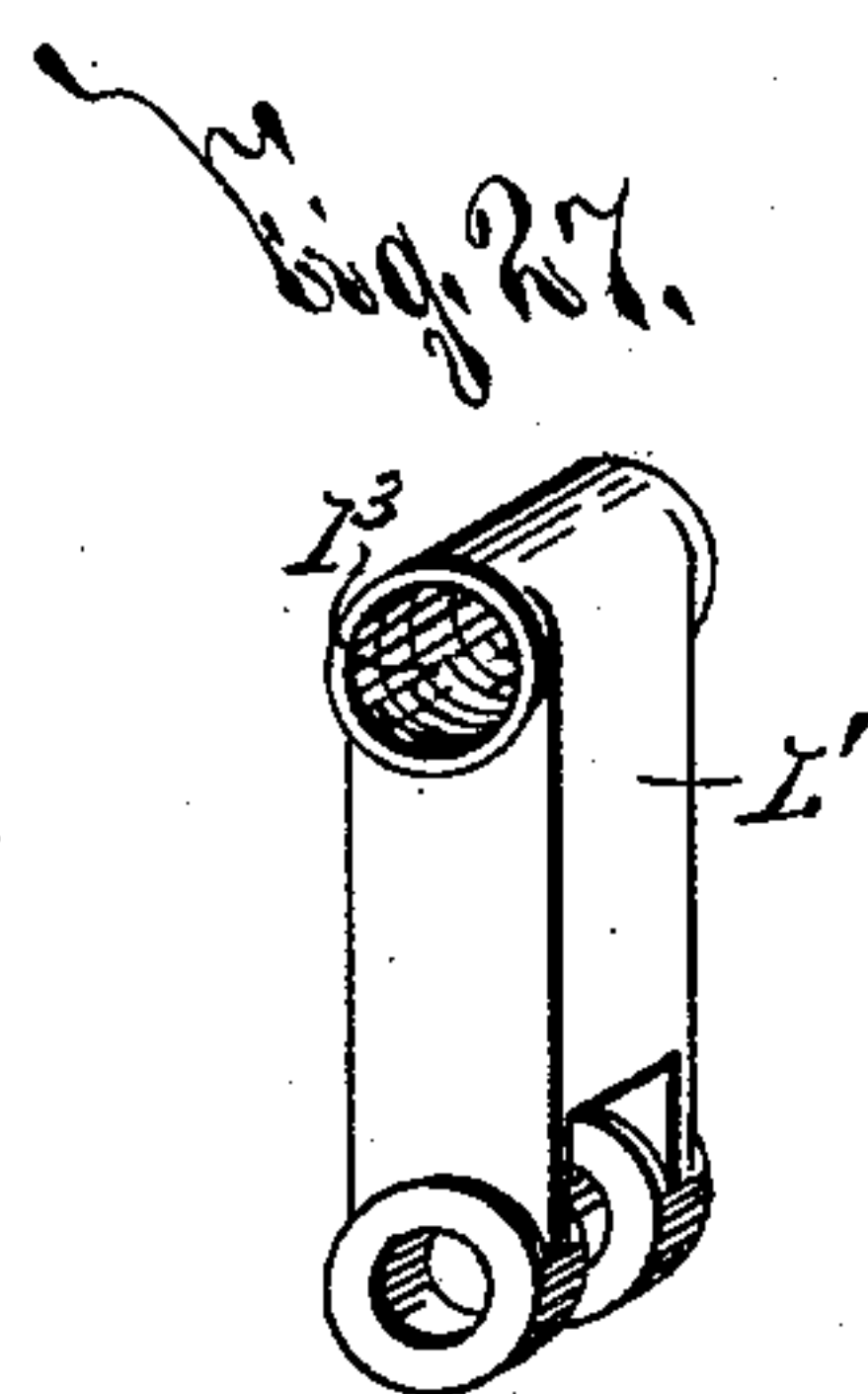
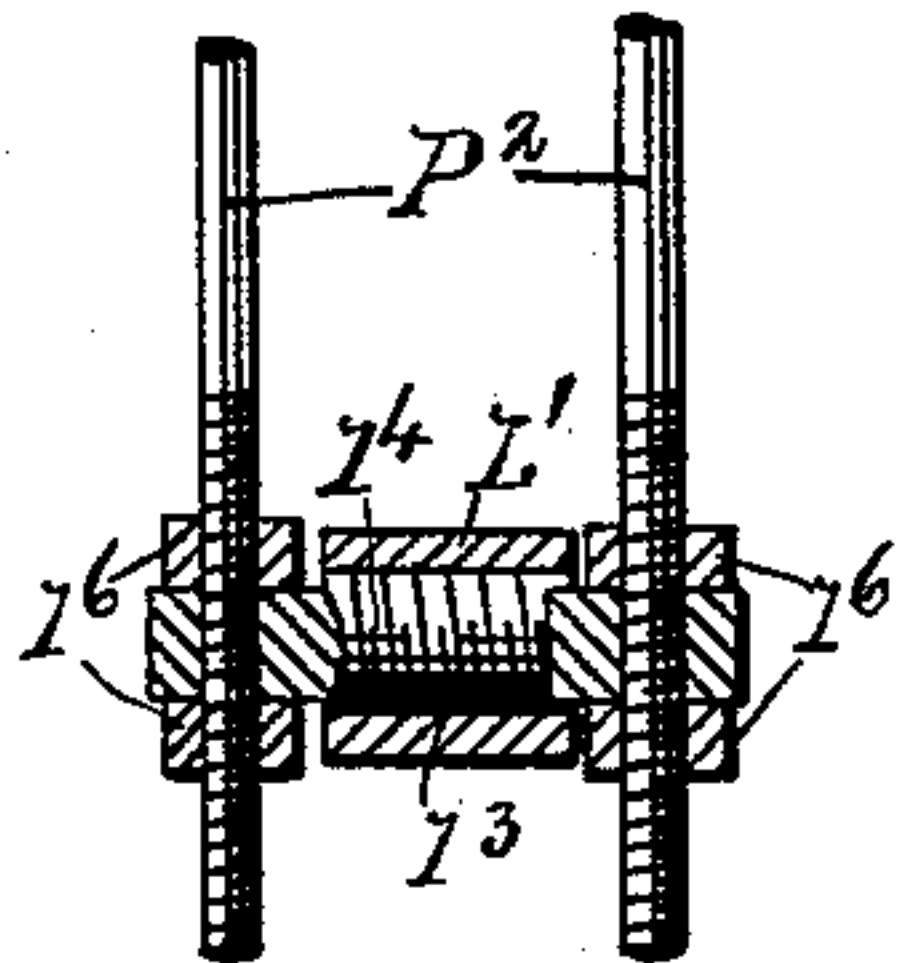
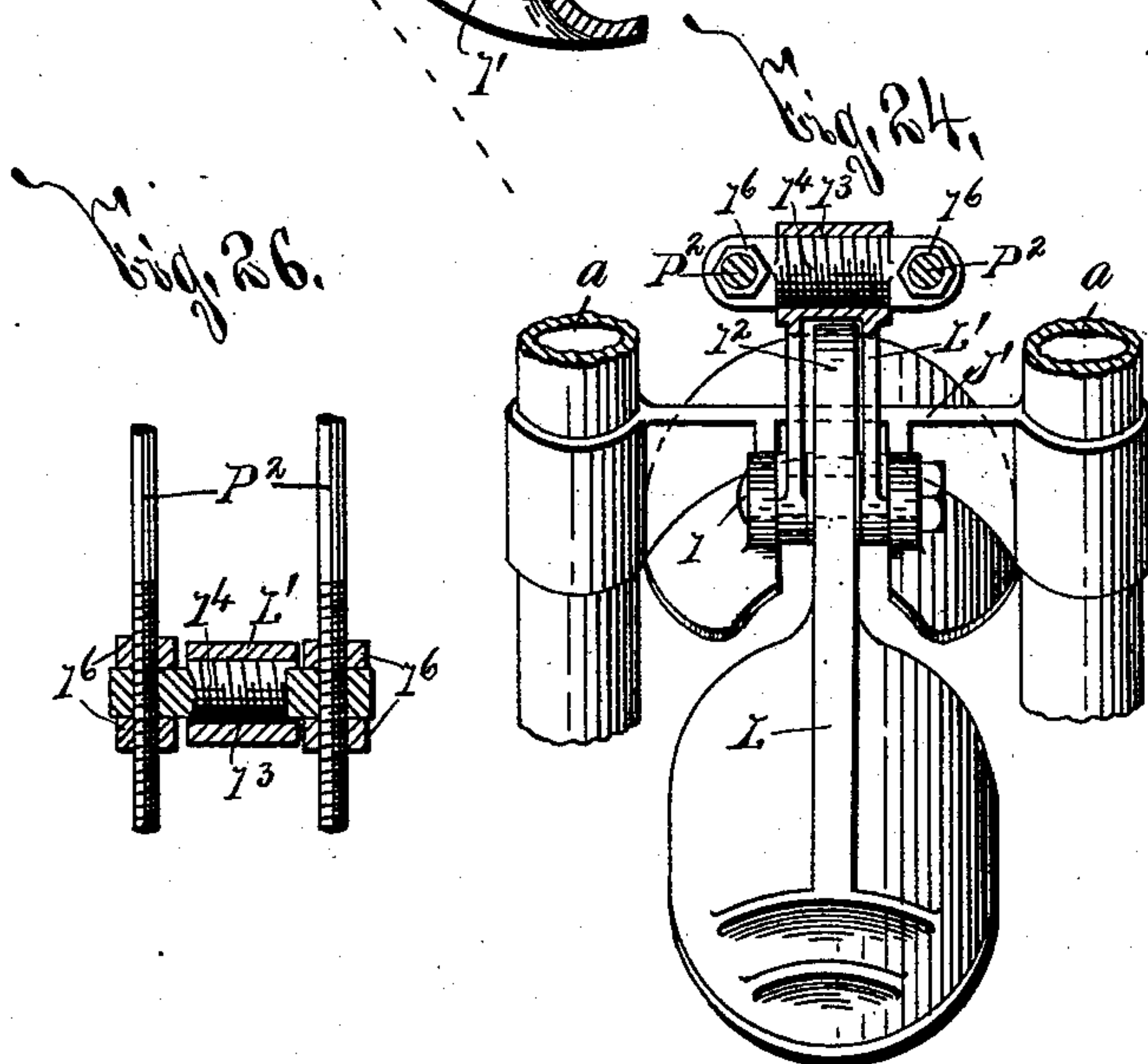
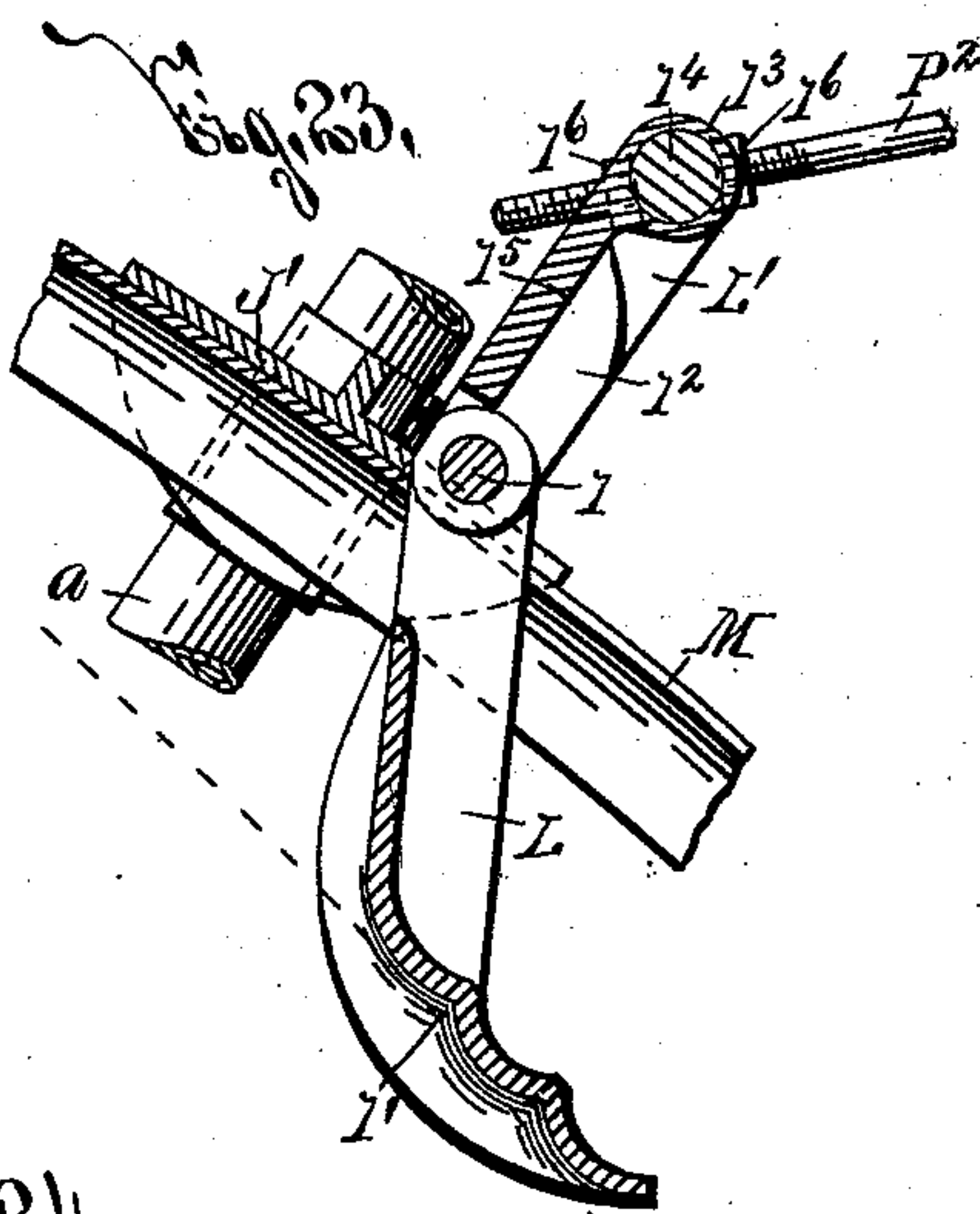
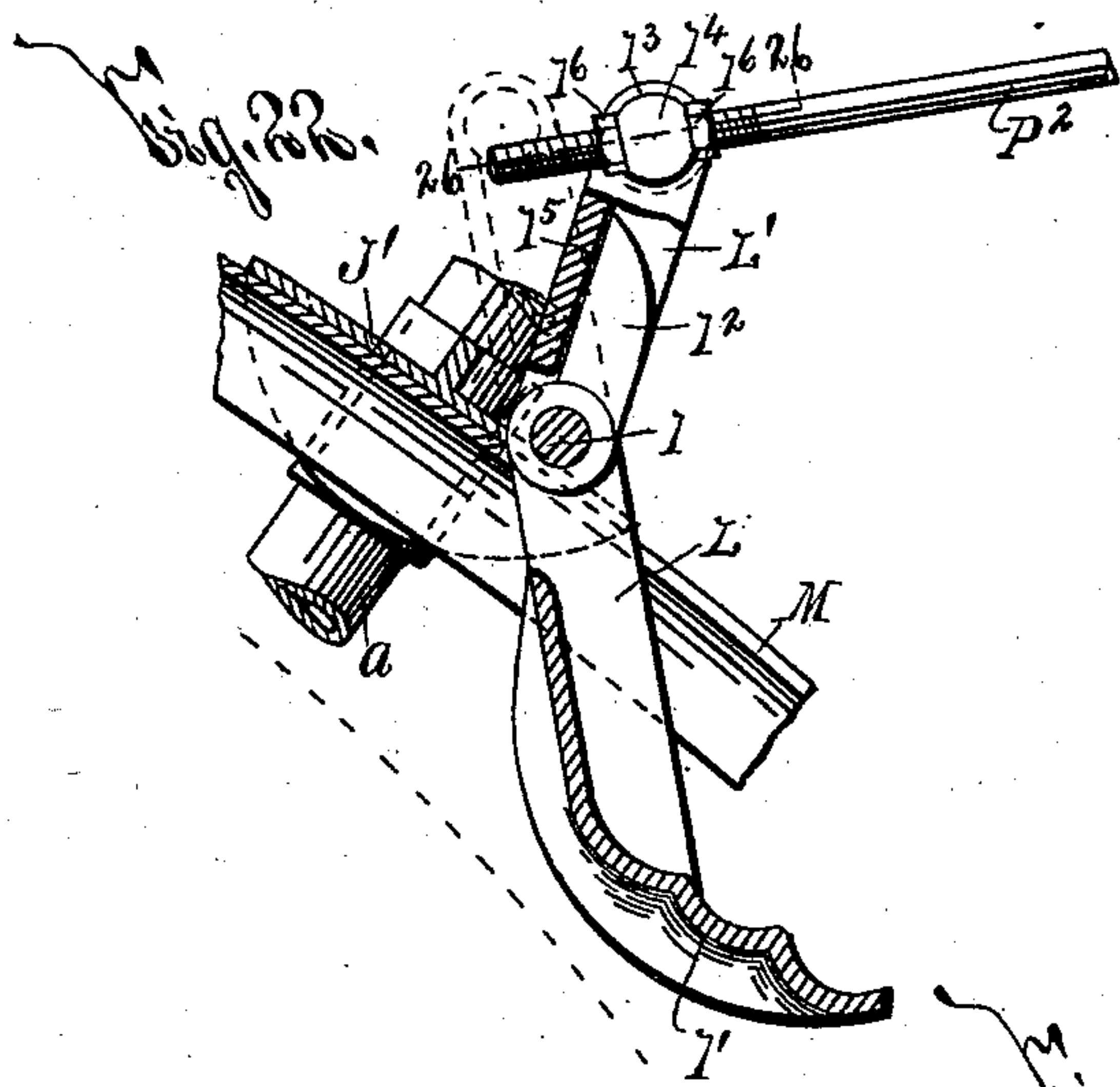
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8 Sheets—Sheet 7.

H. LA CASSE.
BICYCLE.

No. 524,389.

Patented Aug. 14, 1894.



WITNESSES:

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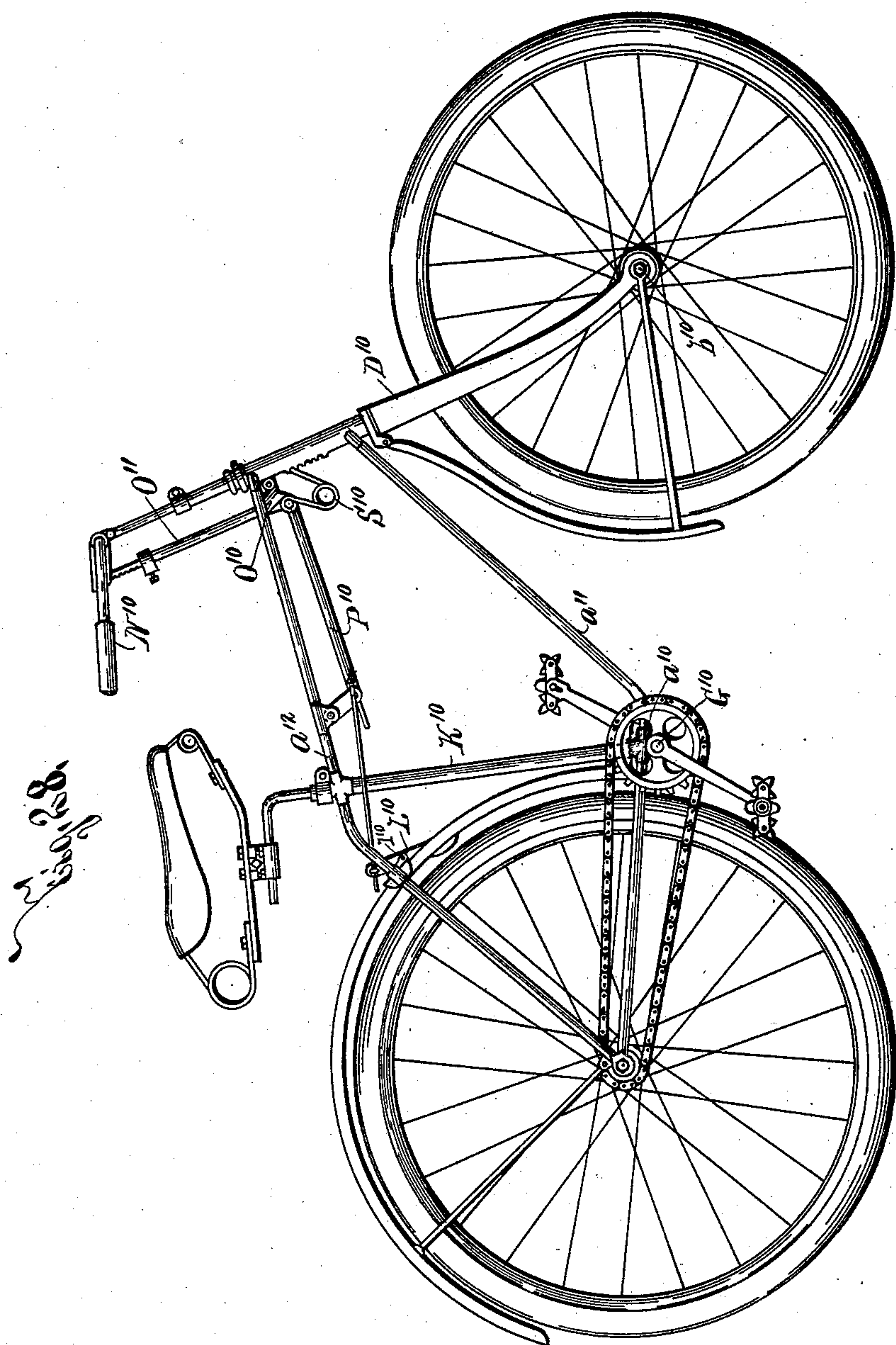
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8 Sheets—Sheet 8.

H. LA CASSE.
BICYCLE.

No. 524,389.

Patented Aug. 14, 1894.



Witnesses:
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UNITED STATES PATENT OFFICE.

HENRY LA CASSE, OF ROCHESTER, NEW YORK.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 524,389, dated August 14, 1894.

Application filed July 24, 1893. Serial No. 481,323. (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
5 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
10 bicycles of the class set forth in my Patent No. 518,411, dated April 17, 1894, and has for its object the production of a simple, practical, and economically manufactured device which reduces to a minimum the jar experienced by the rider, and is highly efficient
15 and durable in use; and to this end it consists in the construction and arrangement of the parts, all as hereinafter more particularly described and pointed out in the claims.

20 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 is a side elevation of my improved
25 bicycle illustrating the general construction and arrangement of its parts. Fig. 2 is a detail elevation, partly in section and partly broken away, of the upper portion of the frame, a part of the seat support, the handle
30 bar, the brake lever, and the connection between said parts. Figs. 3 and 4 are, respectively, elevation and top plan views of the rear axle, the sprocket wheel thereon and the adjacent parts of the frame. Figs. 5 and 6
35 are, respectively, elevation and top plan view of the lower end of the seat support, the pedal shaft, the adjacent portions of the frame, and the connections between the pedal shaft and the frame. Fig. 7 is a vertical sectional view,
40 taken on line 7—7, Fig. 4. Fig. 8 is a sectional view of a portion of the frame, the lower end of the seat support, the pedal shaft, the knuckle connecting the frame and pedal shaft, and the front end of the link secured
45 to said knuckle. Fig. 9 is a transverse sectional view, taken on line 9—9, Fig. 8, the parts being shown as outwardly unfolded from their operative position. Fig. 10 is a sectional view of one of the ball bearing sections seen at Fig. 9. Fig. 11 is a longitudinal sectional view of the rear axle, taken on
50 line 11—11, Fig. 3. Figs. 12 and 13 are, re-

spectively, elevation and top plan view of the upper end of the steering rod shown partly in section at Fig. 12 and the adjacent portion
55 of the handle bar. Figs. 14 and 15 are, respectively, elevation and top plan view, partly in section, of the upper end of the frame head in which the steering rod is journaled, a lever
60 hinged to said head, and the adjacent ends of connections from said lever to the handle bar and the seat support and brake lever. Figs. 16 and 17 are, respectively, vertical sectional
65 view and top plan view, partly in section, of the lower end of said head secured to the frame. Fig. 18 is an elevation, partly in section, of the front axle, the lower ends of the fork, and the links connecting the said axle and fork. Fig. 19 is an end elevation of the front axle
70 having the adjacent end of one of the links secured thereto indicated by dotted lines in operative position thereon. Figs. 20 and 21 are, respectively, vertical and horizontal sectional
75 views of the upper portion of the seat support, the hinged lever secured thereto, and the adjacent end of the link between said lever and the hinged lever best seen at Figs. 14
80 and 15 connected to the handle bar. Figs. 22 and 23 are vertical sectional views of the brake lever, the link for engaging the same and the adjacent portion of the frame, the
85 brake lever being shown in operative position at Fig. 23. Fig. 24 is an elevation, partly in section, of the parts as shown at Fig. 23. Fig. 25 is a top plan view of the detached
90 coupling or clip for supporting the brake lever. Fig. 26 is a detail sectional view, taken on line 26—26, Fig. 22. Fig. 27 is an isometric perspective of the link for engaging the brake lever, and Fig. 28 is an elevation of a
95 bicycle embodying a modified form of my invention.

The frame of my bicycle is composed of upper bars *a a* having downwardly inclined rear ends, lower bars *a' a'* having their rear ends
95 secured to the corresponding ends of the bars *a a* and their front ends inclined upwardly, and an upright head *a²* having its opposite extremity secured to the front ends of the bars *a a, a' a'*.

100
B C are, respectively, the front and rear wheels, D the fork, and *d* the steering rod which is journaled within the frame head *a* by upper and lower ball bearings *d' d²*. The

upper extremity of the lower section d^3 of the steering rod is provided with a lengthwise groove d^4 and a clamp d^5 , and the upper section d^6 thereof is adjustable lengthwisely in the lower section d^3 , and its upper end is hinged at d^7 to depending ears $N' N'$ formed upon the handle bar N presently described.

$E E$ are opposite links having their upper ends hinged by pivotal pins $D' D'$ to the lower extremities of the branches of the fork D , and their lower ends rigidly secured to the opposite ends of the front wheel shaft b , which, as best seen at Fig. 19, are formed angular in cross section.

As clearly seen at Fig. 1 the links $E E$ incline downwardly and rearwardly from their upper extremities, and consequently the axle b is at the rear of a perpendicular line drawn through the pivotal pins $D' D'$ of the upper extremities of said links, and in operation the lower ends of said links swing upwardly as the front wheel rises over an obstruction. The upper ends of the links $E E$, as best seen at Fig. 18, are bifurcated and are provided with opposite ball bearing sections $e e$, and anti-friction balls e' are interposed between said sections and opposite ball bearing faces D^2 upon the adjacent branches of the fork D for aiding the pivotal movement of the upper ends of the links $E E$ upon the lower ends of the forked branches.

$E' E'$ are springs having their upper ends secured to the opposite arms of the fork D and their lower ends engaged with the lower ends of the links $E E$ for normally depressing the lower ends of said links, and $D^3 E^2$ are shoulders formed respectively upon the branches of the fork D and the links $E E$ for limiting the upward movement of the front wheel against the action of the springs $E' E'$ as the front wheel rises over an obstruction of undue size.

As clearly seen at Fig. 18 the hub b' of the front wheel B is journaled upon the axle b by ball bearing sections $b^2 b^3$ arranged at the opposite ends of said hub and axle between the links $E E$.

$b^4 b^4$ are screws having their adjacent ends movable within the axle b and their outer ends formed with heads for securing together the ball bearing sections $b^2 b^3$ and holding the links $E E$ from lengthwise movement on the axle b , and $f f$ are supporting tie bars having their forward ends hinged upon said screws $b^4 b^4$ and their rear ends suitably connected to a front mud guard F having its upper end hinged at F' to the lower end of the frame head a^2 . This is a particularly practical and effective construction of support for the front wheel, as it reduces to a minimum the jar usually transmitted from said wheel to the steering rod, and permits the wheel to yield practically and effectively when passing over an obstruction even of considerable size. Moreover if, owing to a flaw therein, one of the springs E' should break, the other forces the front axle b downwardly, since the lower

ends of the links $E E$ are rigidly secured to said front axle, and, even if both springs should break; the shoulders $D^3 E^2$ prevent the wheel from assuming an inoperative position.

The pedal shaft G is supported by a knuckle H , a link I , and a spring J for holding said knuckle and link in their normal position.

As best seen at Figs. 1, 3, 4, 8, and 9 the knuckle H consists of levers $H' H^2 H^3$. The lever H' is of the cross section best seen in Fig. 8, and is disposed normally in a substantially horizontal plane, and its rear extremity is formed with an eye h encircling the central portion of a pin or bolt h' having its opposite ends encircled by eyes $h^2 h^2$ formed upon the forward end of the lever H^3 . The eye h is provided with a suitable cut-out for receiving the lower end of the seat support, presently described. The forward end of the lever H' is formed with eyes $h^3 h^3$ encircling the opposite ends of a pin or bolt h^4 , the central portion of which is encircled by an eye h^5 formed upon the forward end of the lever H^2 .

The lever H^2 has a curved body forming practically a right angle. Its rear end curves closely over and is disposed above its front end and above the raised central portion of the lever H' , and is formed with an eye h^6 encircling the central portion of a pin or bolt h^7 , the opposite ends of which are mounted in eyes $h^8 h^8$ formed upon a clip or cross bar h^9 having its opposite ends rigidly secured to the lower frame bars $a' a'$.

The forward end of the lever H^3 extends downwardly, its central portion is formed with a hub h^{10} for receiving the pedal shaft G , and its rear end consists of separated arms $h^{11} h^{11}$ secured to the forward end of the link I , which consists of separated bars having their rear ends hinged at i to ears depending from the rear ends of the lower frame bars $a' a'$. It is thus readily apparent that the rear end of the lever H' swings downwardly as said lever rocks on the pivotal pin or bolt h^4 ; that the forward end of the lever H^2 swings downwardly and backwardly as said lever rocks upon the pivotal pin or bolt h^7 , and that the forward end of the lever H^3 rigidly secured at its rear end to the link I swings downwardly as said link rocks upon the pivots $i i$.

In order to facilitate the movement of the levers $H' H^2 H^3$ and to reduce to a minimum the friction resultant from said movement the opposite ends of the pivotal pins or bolts $h' h^4 h^7$ are provided with ball bearing sections $h^{12} h^{13}$ between the adjacent faces of which are interposed anti-friction balls h^{14} . The inner ball bearing sections h^{13} on the pivotal pins or bolts $h' h^4 h^7$ are secured respectively to the eyes $h h^5 h^6$ in the usual manner, and the outer ball bearing sections h^{12} are secured respectively to the eyes $h^2 h^2$, $h^3 h^3$, and $h^8 h^8$. The bolts or pivotal pins $h' h^4$ and h^7 serve to more firmly secure the ball bearing sections together and to suitably adjust the same.

The spring J is composed of an intermedi-

ate portion or central bar j and opposite extremities, which extend from the opposite ends of said bar, and are each formed of a central coiled portion j' and lower and upper arms j^2 j^3 . The upper ends of the upper arms j^3 j^3 extend to the central cross bar j and the lower ends of the arms j^2 j^2 are adjustably secured in eyes j^4 j^4 hinged at j^5 to the clip or cross bar h^9 previously described.

10 The intermediate portion or central cross bar j of the spring J is engaged with notches or seats k k in a suitable upwardly extending seat support K having its lower end formed with an eye k' hinged upon the central portion of the pivotal pin or bolt h' .

15 The seat support K and the lever H^3 connected thereto serve as a connection between the intermediate portion or central bar of the spring J and the pedal-shaft, which is journaled in the lever H^3 . The upper end of this seat support K is hollow, and is formed with a lengthwise slot, not illustrated, and is provided with a clamp k^2 for securing in position the usual seat supporting bracket K' , the lower
25 end of which enters the upper end of the seat support K.

The seat or saddle K^2 is of any desirable form, size, and construction, and is adjustably secured by a clip K^3 to the upper end of the
30 seat supporting bracket K' .

The pedal shaft G is provided with a sprocket wheel g and with suitable pedal cranks G' G' , and, in order that said shaft may revolve freely, its opposite ends are encircled with
35 ball bearing sections g' g^2 secured, respectively to the shaft G and to the hub of the lever H^3 . The adjacent faces of the ball bearing sections g' g^2 are formed with grooves g^3 g^3 of angular cross section, and movable in said grooves are anti-friction balls g^4 . It is evident, however, that any suitable construction of ball bearing for the shaft G may be used if desired. This is a particularly simple and practical construction of support for the
40 seat and the pedal shaft, and it is apparent that, as both the pedal shaft, knuckle H, link I, and the seat support K are held in operative position by the spring J which forms a yielding connection between the rigid bicycle frame and said parts, the rider's body mounted on the seat K^2 and his feet resting on the pedals of the pedal shaft G vibrate in unison, and consequently the jar transmitted to the rider by the seat and pedals is reduced to a
55 minimum.

The rear wheel C is formed with a hub C' mounted on the rear axle c , and at the opposite extremities of the axle c are ball bearing sections c' c^2 secured respectively to the hub
60 C' and to the axle c , and having their adjacent faces separated by anti-friction balls c^3 movable in grooves in said faces.

C^2 is a sprocket wheel secured at one end of the hub C' , and C^3 is a chain movable over said sprocket wheel C^2 and the similar wheel
65 g upon the pedal shaft.

At the outside of the ball bearing sections c' c^2 are eyes C^4 C^4 each provided with movable hollow nuts C^5 C^5 for receiving screw threaded arms projecting from the lower rear
70 extremity of the bicycle frame, thus enabling the ready adjustment of the chain C^3 .

C^6 C^6 are screws having their ends inserted within the ends of the rear axle c , and their heads bearing against the eyes C^4 C^4 for preventing lengthwise movement of said eyes upon the axle c . 75

The brake lever L of my improved bicycle is pivoted to a pin or bolt l mounted in ears formed upon a clip or tie plate J' having its
80 opposite extremities secured to the downwardly extending ends of the frame bars a a , and its central portion secured to the central portion of the rear mud guard M.

The front extremity of the mud guard M is secured to the lower frame bar a' a' , and serves to brace or hold apart the central portions of the upper and lower frame bars a a , a' a' , and the rear extremity of said mud guard is supported by ties m m arranged at opposite sides of the rear wheel C and having their forward ends secured to the rear end of the bicycle frame. 85

The lower end of the brake lever L is formed with a corrugated or grooved face l' for engaging the tire of the rear wheel C, and the upper end of said brake lever is formed with an arm l^2 extending above the pivotal pin l . 90

L' is a link having its lower end hinged to the pivotal pin for the brake lever L, and its upper end provided with a screw threaded socket l^3 for receiving a head l^4 journaled in said socket. The central portion of said link is formed with a bearing face l^5 normally separated from the adjacent face of the brake lever arm l^2 , as shown by dotted lines at Fig. 22. As the upper end of the link L' is rocked forwardly the face l^5 engages the adjacent face of the brake lever arm l^2 and forces the lower end of said brake lever into operative engagement with the tire of the rear wheel C. 100

The handle bar N is of any desirable form, size, and construction, and its central portion is formed with a rearwardly extending arm n provided with a downwardly extending socket
115 n' having an opening n^2 in its lower extremity and provided also with a nut or cap n^3 for closing said socket.

Pivoted at o to an ear projecting rearwardly from the frame head a^2 is the intermediate portion of a lever O provided at one extremity with an upwardly extending socket o' having an aperture o^2 in its upper end and with a nut or cap o^3 for closing said socket. 120

O' is a link provided with upper and lower ball shaped ends O^2 O^3 movable respectively in the socket n' of the arm n and the socket o' of the lever O. The link O' is preferably adjustable lengthwisely in order to accommodate its length to the projection of the steering rod section d^3 above the frame head a^2 , 125
130

and consists of a lower tubular section O^4 provided at its upper end with a set screw or other fastening device O^5 and an upper section O^6 telescoping within the upper end of the lower section O^4 and formed with notches O^7 for receiving the inner end of the screw O^5 . The outer ends of the sections of the link O' are formed with the contracted portions or necks $O^8 O^9$ which are adjacent to the ball shaped portions $O^2 O^3$, and are registered with the apertures $n^2 o^2$ formed respectively in the arm n and the lever O .

As clearly seen at Fig. 14 the ball shaped end O^3 of the link O' is formed separable from the remaining portion of the tubular section O^4 of said link upon a short stud or bar having its opposite end screw threaded and engaged with the lower end of said section O^4 .

P is a link arranged in a plane substantially parallel with the plane of the forward ends of the frame bars $a a$ and having one end hinged at p to the lower end of the lever O and the other provided with a head having a concaved rear face and formed with transversely extending sockets $p' p'$ and a lengthwisely extending socket p^2 .

$P' P'$ are heads having screw threaded arms movably mounted in the sockets $p' p'$, and $P^2 P^2$ are rods having their forward ends mounted in sockets $p^3 p^3$ formed in the outer ends of the heads $P' P'$ and their rear ends adjustably secured in the opposite ends of the head l^4 by nuts $l^6 l^6$ bearing upon opposite sides of the opposite ends of said head.

P^3 is an arm or guiding bar of rounding cross section having its forward end supported in the socket p^2 of the head at the rear end of the link P .

R is a movable support or lever having its central portion hinged at r to a clip plate R' secured at its opposite ends to the central portions of the upper frame bars $a a$ and its rear extremity hinged at r' to the upper end of the seat support K . The forward end of the lever R is formed with a downturned arm journaled on a movable bar or head R^2 of rounding cross section bearing against the rounding rear face of the head at the rear end of the link P and formed with a transverse opening R^3 for receiving the guiding bar or arm P^3 and permitting said arm to move lengthwisely through said head or bar R^2 .

It will thus be seen that the link O' , the link O , the link P , the rods $P^2 P^2$ and the lever R form a connection between the handle bar N and the brake lever L , whereby, when the handle bar N is depressed, the brake lever is brought into operation, and that the support or lever R forms a movable connection between the seat support and the brake operating mechanism, whereby the seat and the handle bar move or vibrate in unison.

The brake operating mechanism is held in operative position by a spring S composed of a central bar s , which enters grooves or seats a^3 in the frame head a^2 and opposite extremi-

ties which are each composed of a central coiled portion s' and separated arms $s^2 s^3$, the arms s^3 being engaged with the lever O and the arms s^2 being extended to the central cross bar s .

When the rider is not mounted upon the seat or saddle K^2 the spring J slightly elevates the seat support above its normal position, and the spring S , which forces the rear end of the link P into engagement with the bar or head R^2 , slightly elevates the handle bar N above its normal position, and, when the rider is upon the seat, both the seat and the handle bar are slightly depressed below their position assumed when the machine is riderless.

In the practical use of my bicycle the bearing face l^5 of the link L' moves toward and away from the adjacent face of the brake lever L^2 as the seat vibrates, but said face is only brought into contact with said brake lever when the handle bar is depressed by the rider a sufficient distance to engage said parts.

At Fig. 28 I have shown a modified form of my improved bicycle in which the crank shaft G^{10} is journaled in rigid ears a^{10} upon the lower frame bars a^{11} , the seat support K^{10} rigidly secured at its lower end to the lower frame bar a^{11} and rigidly secured at its upper end to the upper frame bars a^{12} , and the front axle b^{10} journaled in the lower ends of the branches of the fork D^{10} .

The brake lever L^{10} is pivoted at l^{10} and a link P^{10} is secured to its upper end and to the adjacent end of a lever O^{10} similar to the lever O shown in the preceding figures.

The handle bar N^{10} , the lever O^{10} , the connection O^{11} between said handle bar and the lever O^{10} , and the spring S^{10} are similar to the corresponding parts $N O O' S$ in the preceding figures.

The operation of my invention will be readily perceived from the foregoing description and upon reference to the drawings, and it will be particularly noted that the frame is extremely durable, owing to its rigidity, and that the convenience and pleasure of the rider is greatly enhanced, since his body, feet, and hands vibrate in unison as the bicycle passes over inequalities in the road bed.

It is evident that the detail construction and arrangement of the parts of my bicycle may be considerably varied without departing from the spirit of my invention, and consequently I do not herein limit myself to such exact 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 frame, a vertically movable seat support flexibly connected to the frame, a handle bar flexibly connected to said frame and seat support and having its hand engaging portions movable vertically in unison with the seat support and movable vertically independently thereof and a brake

connected with the handle bar and applied by the independent movement thereof, substantially as described.

2. The combination of a frame, a vertically movable seat support flexibly connected to the frame, a link movable lengthwise of the frame and connected to the seat support, a handle bar flexibly connected to said frame and seat support and having its hand engaging portion movable vertically in unison with the seat support and similarly movable independently thereof, and a second link as O' connected by universal connections to the former link and to the handle bar, whereby the former link is moved lengthwise as the hand engaging portions of the handle bar move vertically, substantially as and for the purpose specified.

3. The combination of a frame, a vertically movable seat support flexibly connected to the frame, a spring for forcing the seat support to its normal position, a link movable lengthwise of the frame and connected to the seat support, a handle bar flexibly connected to said frame and seat support and having its hand engaging portions movable vertically in unison with the seat support and similarly movable independently thereof, a second link as O' connected by universal connections to the former link and to the handle bar, whereby the former link is moved lengthwise as the hand engaging portions of the handle bar move vertically, and a second spring for forcing the handle bar to its normal position, substantially as set forth.

4. The combination with a frame, a vertically movable pedal-shaft, a knuckle between the pedal-shaft and the frame comprising a series of levers pivoted to each other and to said pedal-shaft and frame, a vertically movable seat support having one end pivoted to one of the levers comprising said knuckle, and a handle bar flexibly connected to said frame and seat support and having its hand engaging portions movable vertically in unison with the seat support and also movable vertically independently thereof and a brake connected with the handle bar and applied by the independent movement thereof, substantially as specified.

5. The combination of a frame, a movable seat support, a lever pivoted to the frame and having one end connected to the seat support, a movable handle bar, a link as P having one end flexibly connected to the handle bar and its other end movable lengthwise in the opposite end of said lever and provided with a shoulder bearing thereagainst, and a spring for forcing said shoulder on the link into engagement with the lever, substantially as and for the purpose specified.

6. The combination of a frame, a movable seat support, a lever R pivoted to the frame and having one end connected to the seat support, a movable handle bar having a socket, a lever O hinged to the frame and

formed with a socket, a link O' having its opposite extremities provided with ball shaped ends mounted within said sockets, a link P having one end flexibly connected to the lever O and its other end movable lengthwise in the opposite end of said lever R and provided with a shoulder bearing thereagainst, and a spring for forcing said parts to their normal position, substantially as specified.

7. The combination of a frame, a vertically moving seat support, a lever pivoted to the frame and connected with the seat support at one end, a bar at the other end thereof having a transverse opening, a link movable lengthwise of the frame and having at its rear end a head with a concave rear face adapted to bear against said bar, a guiding bar connected with the head and sliding through the opening in said bar, a brake lever movably mounted on the frame, a rod detachably engaged with the brake lever and connected with the link, and a hinged handle bar connected to the link for actuating the same, substantially as and for the purpose described.

8. The combination of a frame, a movable seat support, a lever pivoted to the frame and having one end connected to the seat support, a movable handle bar, a link P having one end flexibly connected to the handle bar and its other end movable lengthwise in the opposite end of said lever and provided with a shoulder bearing thereagainst, a spring for forcing said shoulder on the link into engagement with the lever, a brake lever movably mounted on the frame, and a rod detachably engaged with the brake lever and connected with the link, substantially as specified.

9. The combination of a frame, a movable seat support, a lever pivoted to the frame and having one end connected to the seat support, a movable handle bar, a link P having one end flexibly connected to the handle bar and its other end movable lengthwise in the opposite end of said lever and provided with a shoulder bearing thereagainst, a spring for forcing said shoulder on the link into engagement with the lever, a brake lever movably mounted on the frame and having an arm, a link mounted on the pivot of the brake lever and having a bearing face in rear of said arm, and connections between this link and the former link, as and for the purpose set forth.

10. The combination of a frame, a movable seat support, a lever pivoted to the frame and having one end connected to the seat support, a movable handle bar, a link P having one end flexibly connected to the handle bar and its other end movable lengthwise in the opposite end of said lever and provided with a shoulder bearing thereagainst, a spring for forcing said shoulder on the link into engagement with the lever, a brake lever movably mounted on the frame and hav-

ing an arm, a link mounted on the pivot of
the brake lever and having a bearing face in
rear of said arm, a head journaled in the up-
per end of this link, and a rod having one
5 end adjustable in said head and the other
end connected with the former link, as and
for the purpose set forth.

In testimony whereof I have hereunto

signed my name, in the presence of two attest-
ing witnesses, at Rochester, in the county of 10
Monroe, in the State of New York, this 18th
day of February, 1893.

HENRY LA CASSE.

Witnesses:

EDWIN W. PARSONS,
E. A. WEISBURG.