

No. 677,079.

Patented June 25, 1901.

J. H. GUILLEY, J. H. PIERCE & J. E. WRIGHT.

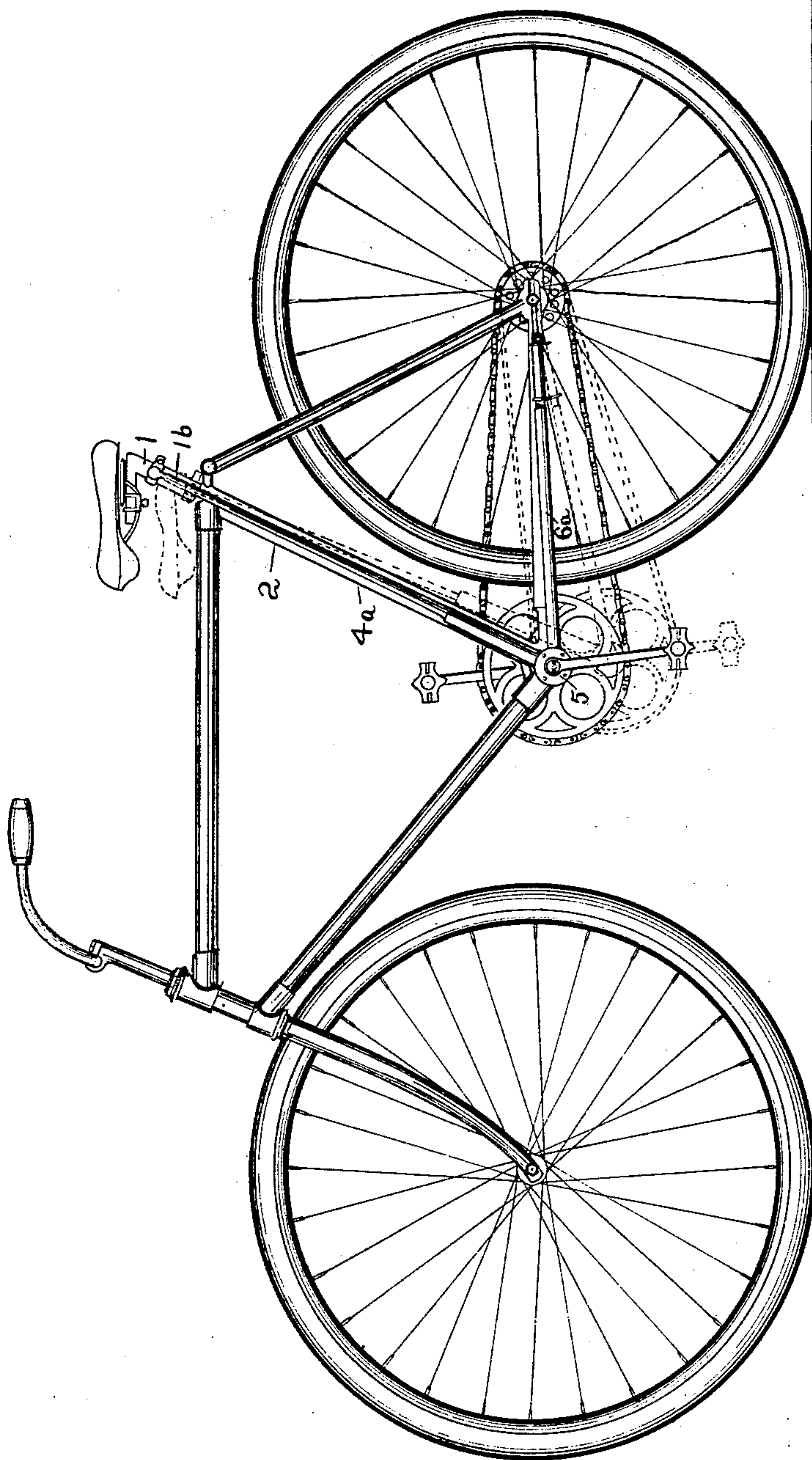
BICYCLE.

(No Model.)

(Application filed Mar. 27, 1900.)

3 Sheets—Sheet 1

Fig. 1.



WITNESSES:
W. Nicholson.
William Stephens

J. H. Guiley
J. H. Pierce
J. E. Wright INVENTORS

BY

Geo. B. Wilcox ATTORNEY.

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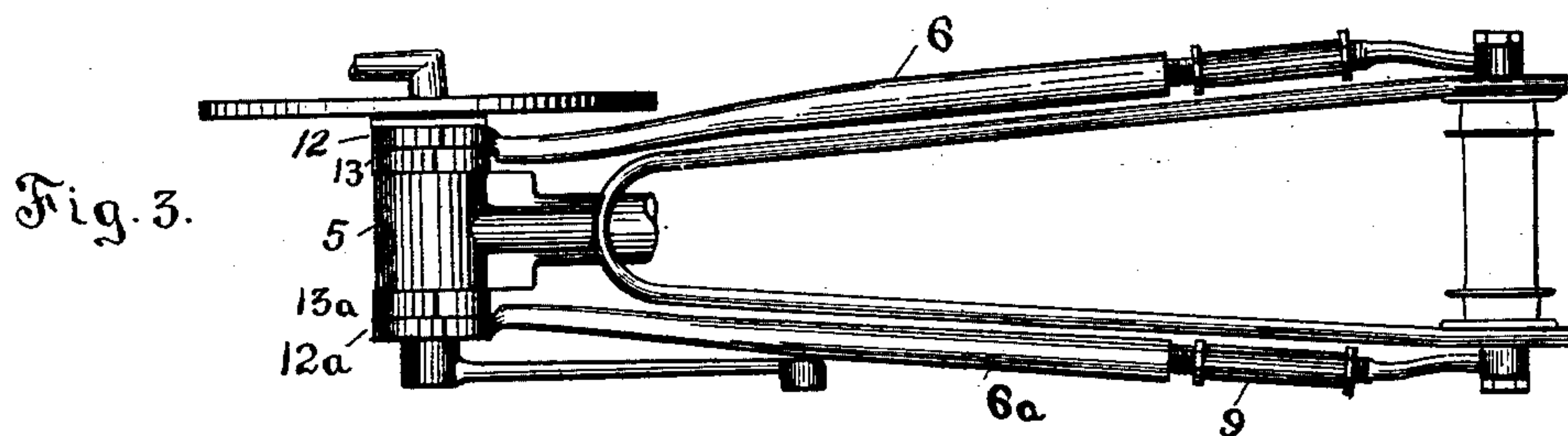
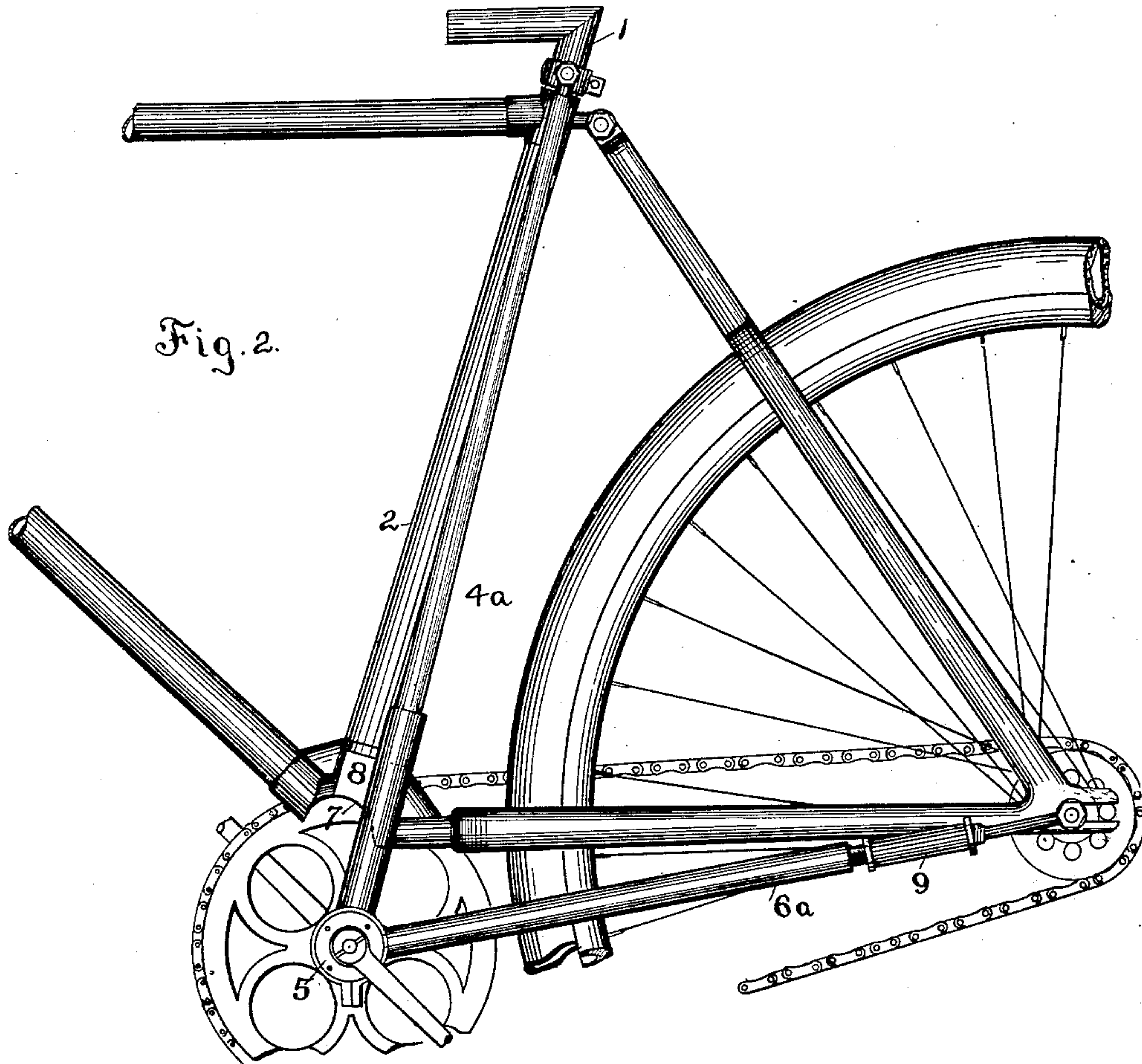
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WITNESSES:
William Stephens
W. Nicholson

J. H. Guiley
J. H. Pierce and J. E. Wright INVENTORS
BY
Geo. B. Wilcox ATTORNEY.

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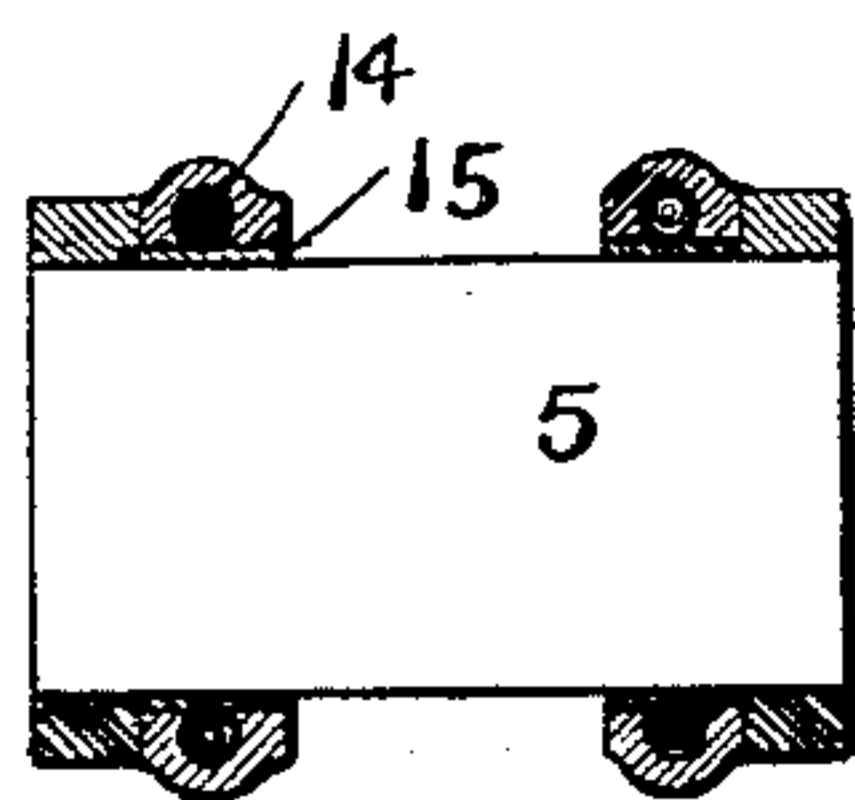
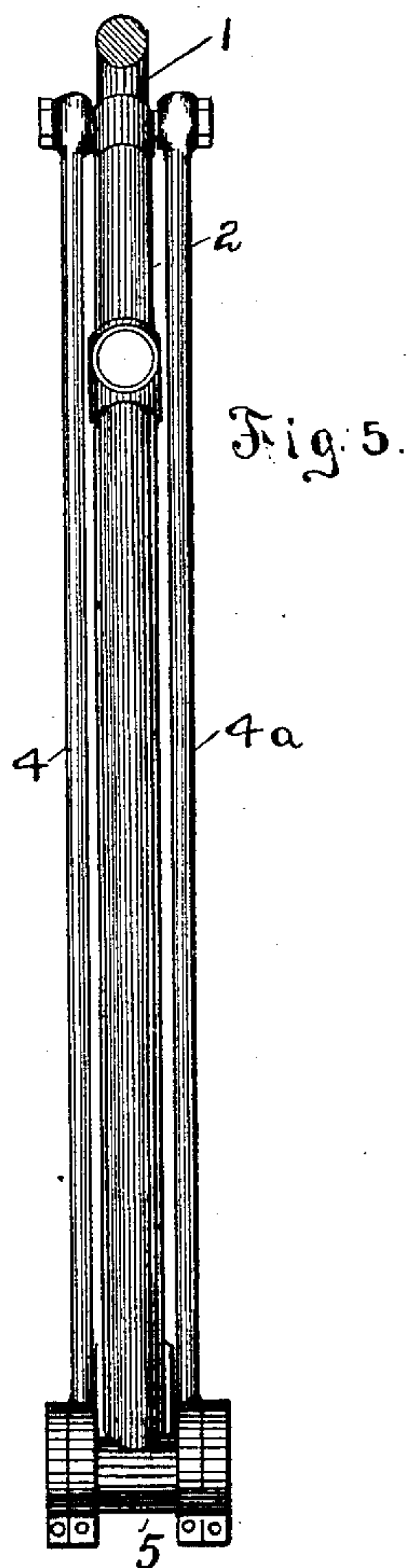
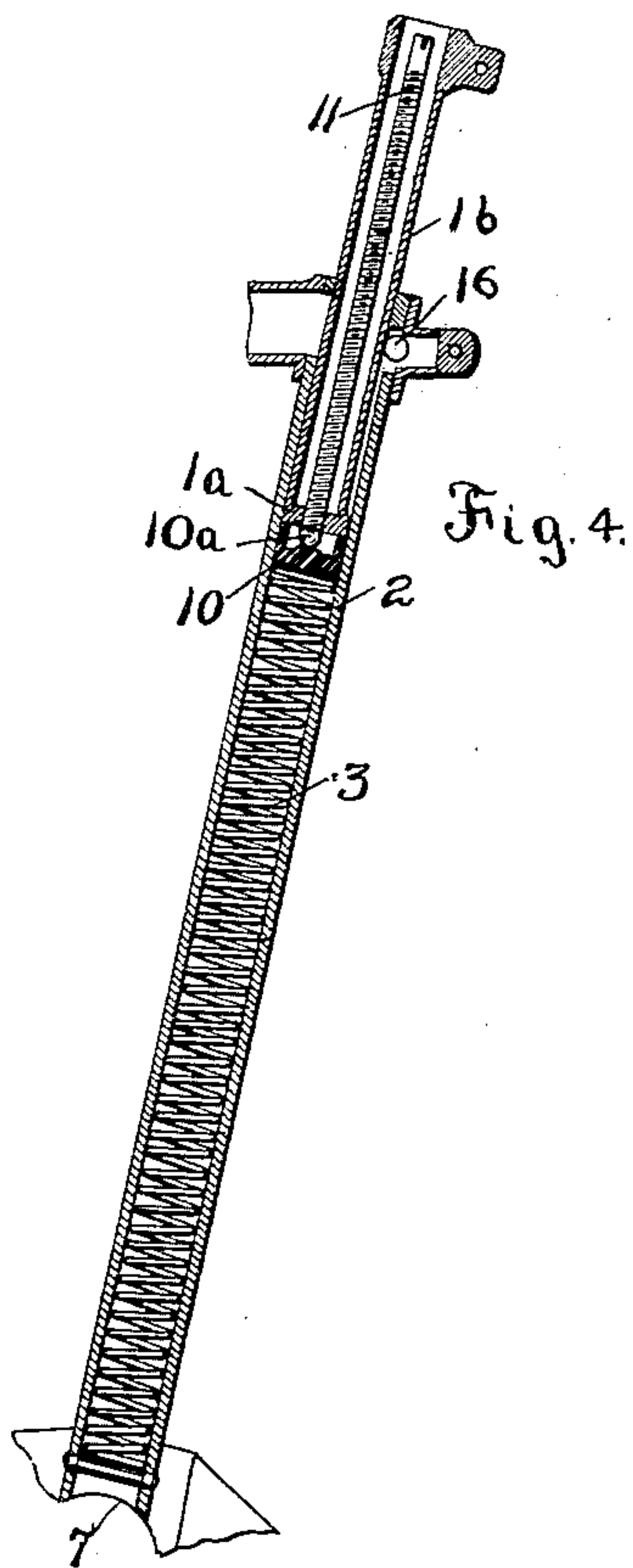
J. H. GUILLEY, J. H. PIERCE & J. E. WRIGHT.

BICYCLE.

(Application filed Mar. 27, 1900.)

(No Model.)

3 Sheets—Sheet 3.



WITNESSES:
William Stephens
W. Nicholson.

J. H. Guilley
J. H. Pierce
J. E. Wright INVENTOR. S.
BY
Geo. B. Wilcox ATTORNEY.

UNITED STATES PATENT OFFICE.

JACOB H. GUILLEY, OF SAGINAW, AND JAMES H. PIERCE AND JAMES E. WRIGHT, OF WEST BAY CITY, MICHIGAN.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 677,079, dated June 25, 1901.

Application filed March 27, 1900. Serial No. 10,358. (No model.)

To all whom it may concern:

Be it known that we, JACOB H. GUILLEY, residing at Saginaw, in the county of Saginaw, and JAMES H. PIERCE and JAMES E. WRIGHT, residing at West Bay City, in the county of Bay, State of Michigan, citizens of the United States, have invented certain new and useful Improvements in Bicycles; and we 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.

Our invention relates to bicycles; and the improvements consist in the construction of the bicycle-frame and the arrangements of its parts, by which the objects of our invention are attained.

The objects are, first, to provide a cushion or spring frame for bicycles that will permit the front and rear wheels to travel over rough or uneven ground or pavements without imparting shock or vibration to the seat or pedals and to accomplish this without greatly altering the construction of the bicycle-frame as ordinarily built; second, to provide for the vertical vibration of the seat and pedals in such manner that the crank-hanger will always move on the arc of a circle struck from a point at or near the center of the rear wheel and be guided by a pair of radial arms pivotally connected to said center; third, to provide means for preventing lateral movement of the rods that connect the crank-hanger to the seat-post, said means being of such construction as to utilize the full strength of the usual type of frame without cutting it for the accommodation of guides, arcs, or similar devices, and, fourth, to provide means for regulating the chain adjustment, tension of the spring that supports the seat, and to insure a fair bearing of the seat-post on the supporting-spring. The means by which we accomplish these objects is illustrated in the accompanying drawings, throughout the several views of which similar characters of reference designate corresponding parts and devices.

Figure 1 is a side view of a bicycle, showing the improvement. Fig. 2 is a detail of

the improvement, showing the seat-post and crank-hanger depressed as they would appear when the wheel passes over a sudden rise in the pavement. Fig. 3 is a plan showing the arrangement of side rods. Fig. 4 is a section of the upright member of the frame, showing the arrangement of the seat-post and spring and the means for adjusting the spring to suit different riders. Fig. 5 is a front view of the upright post, showing the two rods that connect the crank-hanger to the seat-post. Fig. 6 is a detail of the bearing by which the side rods are connected to the crank-hanger.

As is clearly shown in the drawings, the device consists in a vertically-movable seat-post 1, carried by the upright member 2 of the bicycle-frame and supported by a coiled spring 3, carried within the upright member. Side rods 4 and 4^a are pivotally connected to the seat-post at their upper ends, and their lower ends support the two sides of the crank-hanger 5, which is independent of the main frame structure of the bicycle. Two other rods 6 and 6^a are pivotally attached at their forward ends to the crank-hanger 5 and extending backward one on each side of the rear wheel are pivoted at their rear ends to the main frame of the bicycle at or near the center of the rear wheel.

The lower connection of the frame members, as at 7, is so constructed as to fit the upper face of the crank-hanger bearing when the latter is in its raised position, and the side rods 6 and 6^a are adjusted to proper length for returning the crank-hanger to its seat.

To prevent lateral movement of the crank-hanger and side rods, a flat bearing-surface 8 is provided on each side of the upright member 2 or in other suitable position, and the inner sides of the rods 4 and 4^a are faced to slip thereon. The wear on these lateral faces is found in practice to be very slight, since no direct pressure is brought upon them by the weight of the rider. Hence we do not ordinarily provide elaborate means for taking up the wear at this point; but, if desired, any suitable means for adjusting may be provided without departing from our invention.

When the rear ends of the radius-rods 6

and 6^a are pivoted to the axis of the rear wheel, means, as a turnbuckle 9, is provided in each rod for lengthening or shortening to accommodate the chain adjustment. When the rods 6 and 6^a are pivoted to the main frame off the center of the rear wheel, (preferably above or below it,) the chain adjustment ceases to affect the radius-rods and the means for lengthening or shortening them may be dispensed with. In the latter case the chain is adjusted as in ordinary bicycles.

The means for cushioning the seat-post consists in a coiled spring 3, preferably resting on the bottom of the upright tube 2. A cupped piston 10, carrying a metal ball 10^a in its center, rests on the top of the spring. The seat-post, which is independent, rests in a sleeve 1^b, which has a bottom 1^a, tapped and threaded to receive the lower end of an adjusting-screw 11, that passes through the seat-post. The lower end of the adjusting-screw is cupped to take the top of the ball 10^a. It is thus evident that when the seat-post is fixed relatively to the crank-hanger by means of the side rods 4 and 4^a the spring 3 may be compressed by screwing down the adjusting-rod 11, forcing the plunger 10 down against the spring. The ball 10^a serves to permit the plunger 10 to adjust itself to the surface of the spring and also acts as a washer to prevent rotation of the plunger and consequent twisting of the spring when the screw 11 is being turned.

The connections between the side rods and the crank-hanger may be made in any suitable manner; but we prefer to employ the means shown in the drawings, in which 12^a and 13^a are straps connected to the sets of radius-rods and to the sets of upright side rods, respectively. The straps surround the crank-hanger, and one set or both sets of straps may have a motion of rotation about the crank-hanger, if desired. In Fig. 6 is shown a section of the straps, one of which is provided with a ball-race 14, the balls of which revolve on a hardened flange 15 of the remaining strap.

While we have shown and described specific forms of connections for the rods and crank-hanger and for the spring adjustment, we do not desire to confine our invention to these forms, since the essential features of the invention would be preserved if other suitable forms of these details were employed.

To lessen the friction between the seat-post sleeve 1^b and its bearing, the rear side of the

seat-post sleeve may be flatted and a roller 16 provided in the member 2, against which the seat-post sleeve bears.

The essence of our invention would be retained if the side rods 4 and 4^a were made shorter than shown in the drawings, being connected to the seat-post sleeve near its lower end by means of a pin passing through a small slot in each side of the member 2. This construction is not shown in the drawings for the sake of clearness and because such a change would be obvious from the description of our invention in this specification.

What we claim is—

1. In combination with the main frame of a bicycle having a downwardly-extending seat-post tube; a seat-post yieldingly mounted on a spring within the seat-post tube; a crank-hanger normally resting against the lower end of the seat-post tube but capable of downward movement independent thereof; a pair of rods, one on each side of the seat-post tube, pivoted at their upper ends to the seat-post and attached at their lower ends to the crank-hanger; guides on the inner surfaces of said rods for engaging similar surfaces on the bicycle-frame; a pair of rearwardly-extending rods pivoted at their rear ends to the main frame at or near the center of the rear wheel, and pivoted at their front ends to the crank-hanger; and turnbuckles in said rearwardly-extending rods for adjusting their length, substantially as described, and for the purposes set forth.

2. In combination with the frame having an immovable seat-post tube; a crank-hanger normally resting in a recess provided in the lower end of the seat-post tube, but capable of downward movement independent thereof; a pair of rods, one on each side of and pivoted to the seat-post at their upper ends, and attached at their lower ends to the crank-hanger; guide-surfaces on said rods for engaging similar surfaces on the bicycle-frame; and a pair of rearwardly-extending rods pivoted at their rear ends to the main frame and attached at their front ends to the crank-hanger.

In testimony whereof we affix our signatures in presence of two witnesses.

JACOB H. GUILLEY.

JAMES H. PIERCE.

JAMES E. WRIGHT.

Witnesses:

GEO. B. WILLCOX,

WILLIAM STEPHENS.