

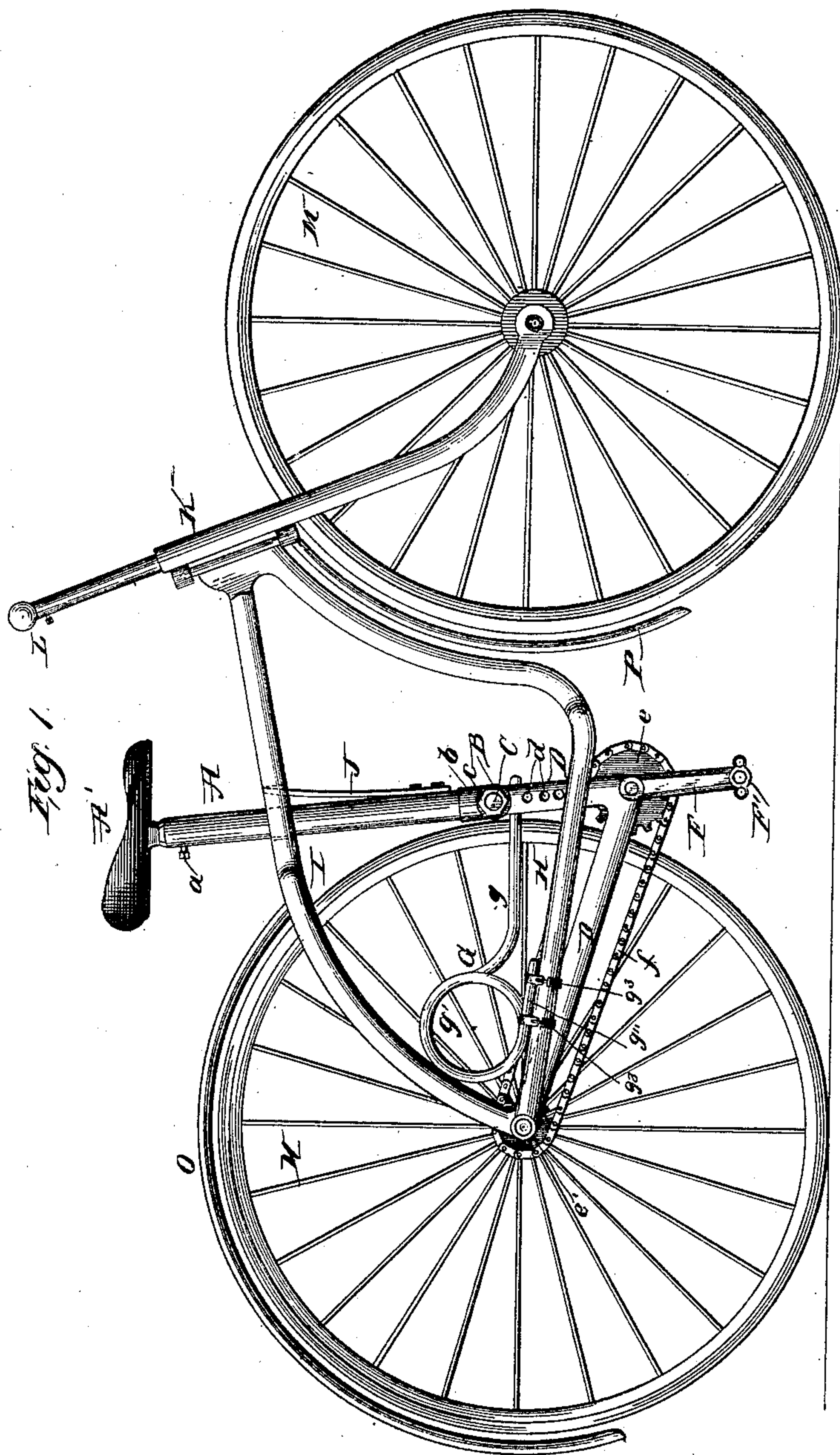
(No Model.)

H. C. GOODRICH.
BICYCLE.

2 Sheets—Sheet 1.

No. 437,191.

Patented Sept. 30, 1890.



Witnesses—

Q. W. Bond
J. W. Bond

Inventor

Harry C Godrich

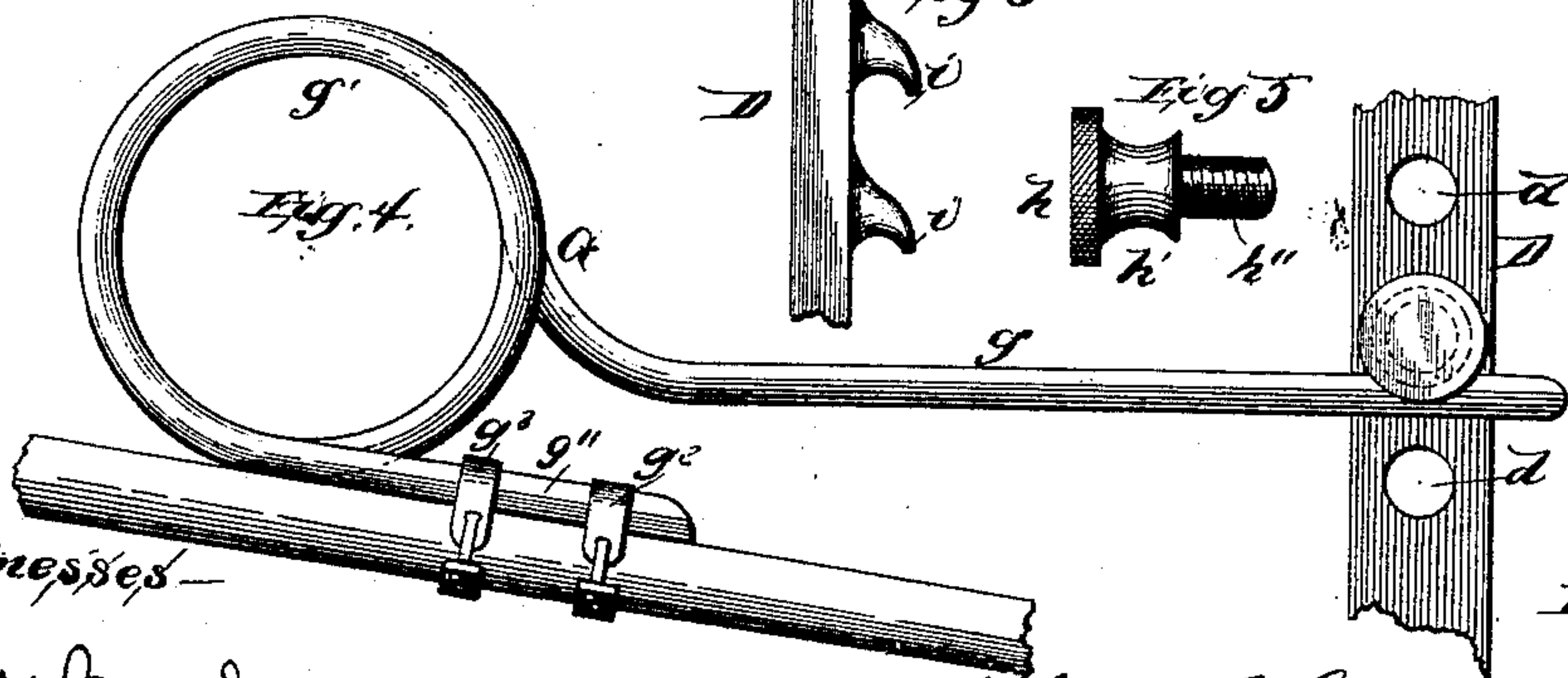
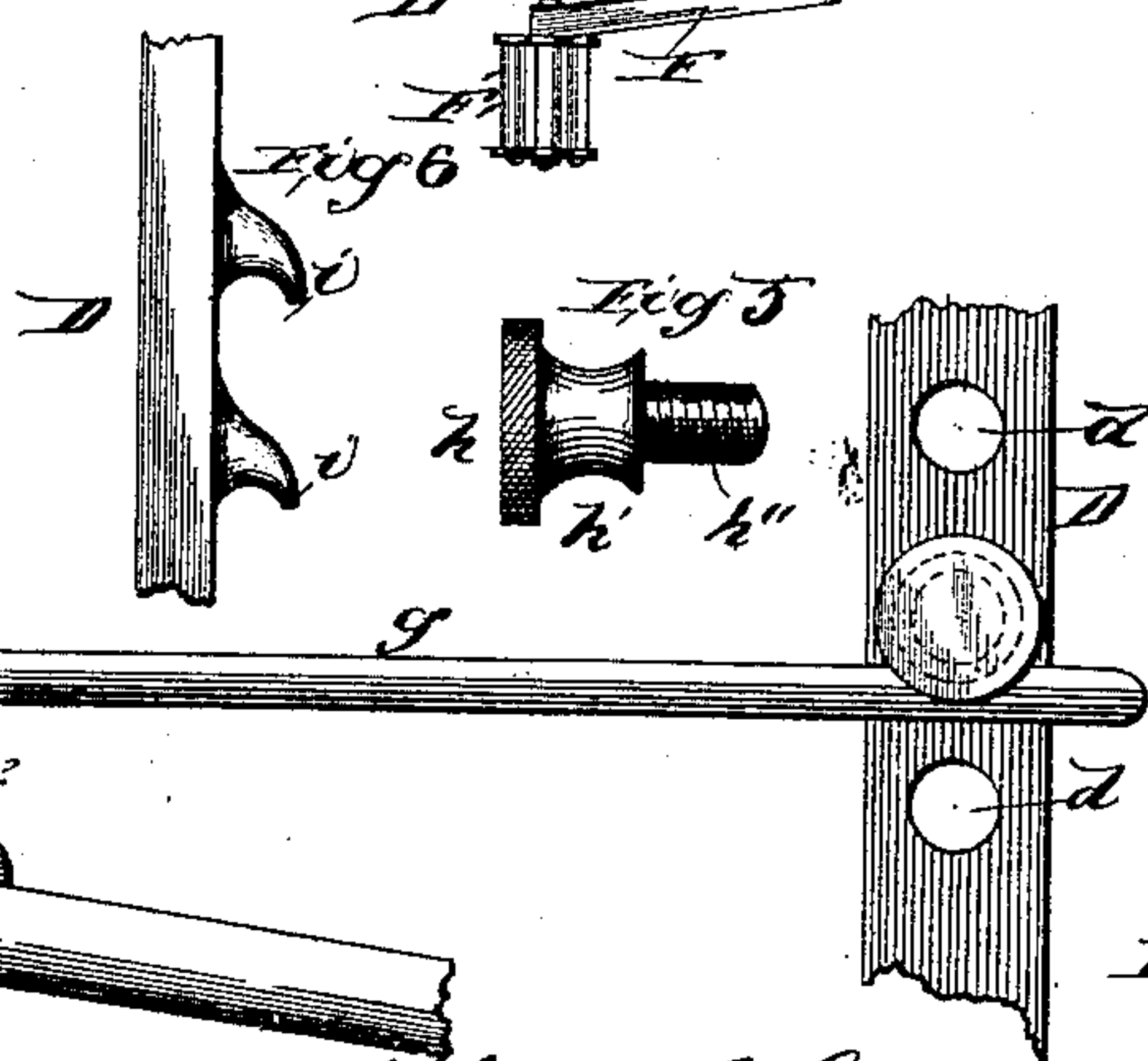
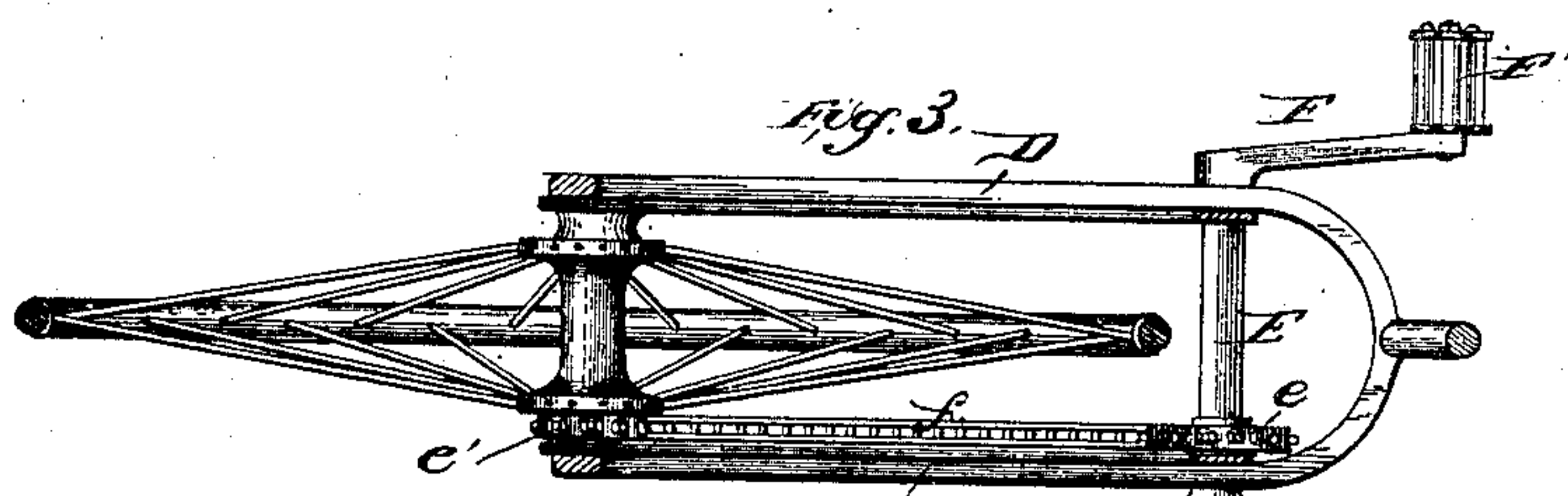
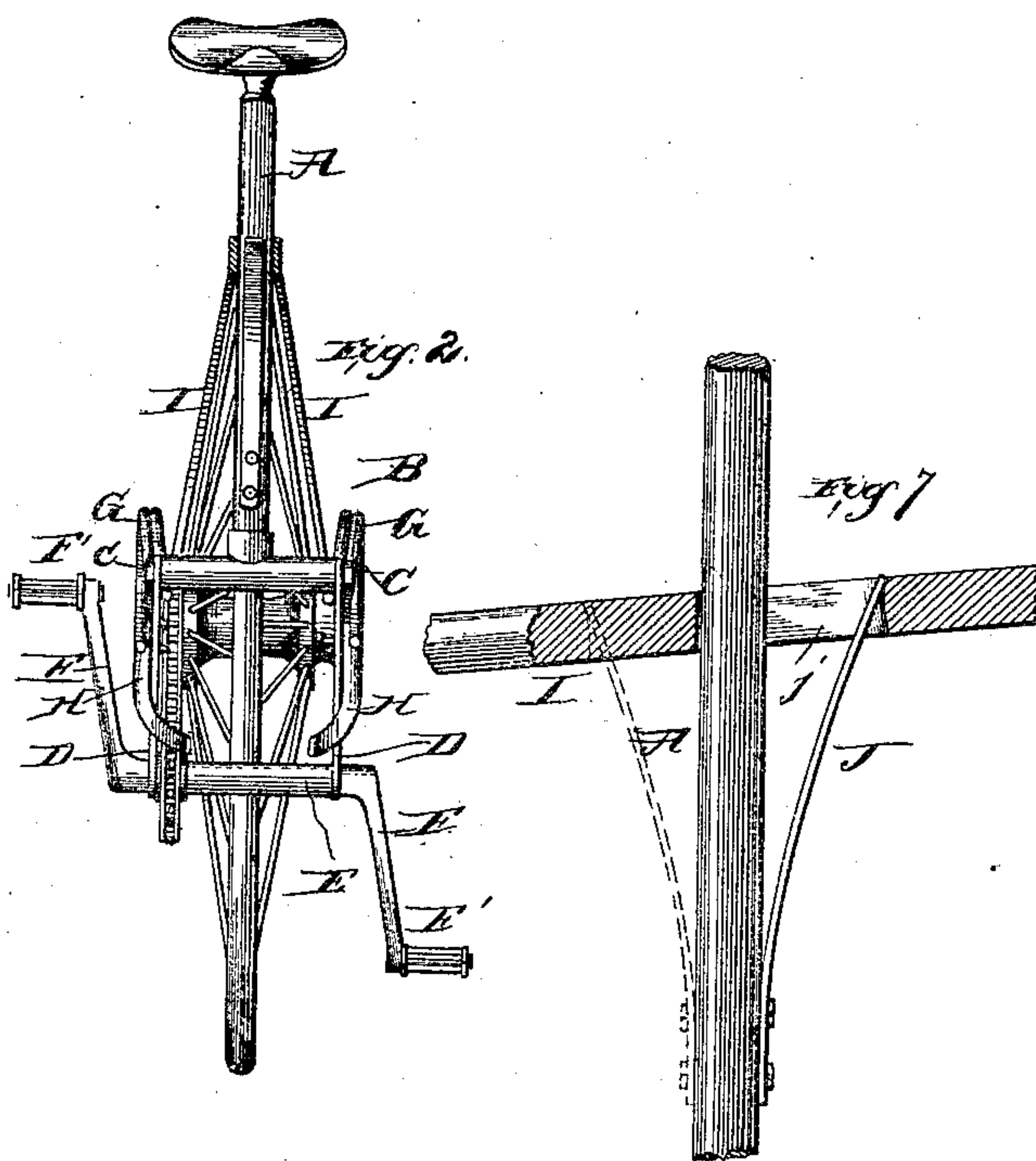
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H. C. GOODRICH.
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Harry C Goodrich

UNITED STATES PATENT OFFICE.

HARRY C. GOODRICH, OF CHICAGO, ILLINOIS.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 437,191, dated September 30, 1890.

Application filed November 7, 1889. Serial No. 329,583. (No model.)

To all whom it may concern:

Be it known that I, HARRY C. GOODRICH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Bicycles; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, forming a part hereof, in which—

Figure 1 is a side elevation. Fig. 2 is a sectional elevation of the rear of the machine, taken on a line forward of the seat. Fig. 3 is a longitudinal section of the rear of the machine, taken on a line above the lower fork of the frame. Fig. 4 is a detail showing the spring and one form of connecting it to the machine. Fig. 5 is a detail of the interlocking-head between the spring and the yoke carrying the seat-standard and treadle. Fig. 6 is a modification showing hooks instead of a head for connecting the spring and yoke. Fig. 7 is a detail showing the seat-standard and the spring for allowing a forward yield of the standard.

It has been found in riding the ordinary form of bicycle having low wheels, and which are usually termed "Safeties," that the effects of the continuous jar are felt more or less by the riders, causing a disagreeable sensation if producing no injurious results, and this continuous vibration is due to the rigidity of the frame connecting the forward and rear wheel, which rigidity of the frame is absolutely necessary in order to properly support the rider, and inasmuch as the jar of the wheel is communicated to the frame and the seat is mounted on the frame it follows that the vibrations are transmitted to the seat and the treadles and are received by the rider.

The main object of the present invention is to overcome this vibrating effect and at the same time have a rigid frame connecting the wheels, with which frame the seat has no connection, to improve the connection between the seat and the treadles, and to improve generally the construction and operation of the machine as a whole; and its nature consists in providing a seat-standard carried by swinging yoke supported by springs, which

yoke likewise carries the treadles, so as to maintain a uniformity of length between the seat and the treadles irrespective of the position of the spring, in providing a seat-supporting standard and a carrying-yoke therefor supported by a spring, to have no connection with the frame of the machine, which remains rigid while the seat and treadles yield, in providing a spring located between a yoke carrying the treadles and the sprocket-wheel and the rigid frame for the driving-wheels, and in the several parts and combinations of parts hereinafter described, and pointed out in the claims as new.

In the drawings, A represents the seat-supporting standard, carrying at its upper end a seat A', which seat is connected to the standard, in the usual manner, by means of a stem on the seat entering a hole in the end of the standard, with a set-screw *a* in the standard, by which the stem can be locked when the seat is properly adjusted.

B is a sleeve, having at its center a socket *b* to receive the lower end of the standard A.

C is a pivotal bolt passing longitudinally through the sleeve B and having at one end a head and at its other end a screw-thread to receive a nut *c*.

D are two arms, which together form a vibrating yoke. Each arm is formed of a long portion and a short portion, the short portion extending up and being attached to the pivotal bolt C, as shown in Figs. 1 and 2, and each short arm of the yoke D has therein a series of adjusting-holes *d*, and the rear end of the arms of the yoke D are attached to the journal-pin of the rear wheel in the arrangement shown.

E is a sleeve located between the arms of the yoke D at the juncture of the long and short portions.

F are the treadle-cranks, each having a treadle F', and these cranks project out in opposite directions from the end of a bearing-pin located in the sleeve E, as usual, which pin projects beyond the outer faces of the yoke D.

G are springs, one for each arm of the yoke D, each spring consisting of an end *g*, a coil *g'*, and an end *g''*, which end *g''* is fastened by clips *g³* to the side bar of the lower fork of the frame. The end *g* of each spring G pro-

jects forward and passes beneath a head h , having a circular depression h' and a screw-threaded stem h'' , which stem can be passed through one of the holes d of the arm of the yoke and be there secured by a suitable nut, and instead of using an adjustable head h for adjusting the tension of the spring such adjustment can be had by hooks i , formed on the side face of each arm of the yoke D, as shown in Figs. 2 and 6.

H is the lower portion of the main frame, formed of a yoke shape at the rear, to receive the rear wheel, as usual, and formed of a single bar at the forward end, as usual.

I is the upper portion of the main frame, consisting of a rear yoke and a single front bar corresponding to the lower portion and rigidly secured to or formed with the lower portion, so that the frame as a whole is one continuous rigid frame, as shown in Fig. 1.

J is a spring secured at its lower end to the seat-standard B, and extending upward with a forward projection and passing at its upper end through a slot j in the upper portion I of the main frame.

K is the yoke-standard for the forward wheels, to which the main frame is pivotally attached in the usual manner.

L are the handles, attached to the standard K, as usual.

M is the front wheel, mounted between the forward standards K as usual.

N is the rear wheel, also of the usual construction and located between the rear forks of the main frame in the usual manner.

O is the mud-guard for the rear wheel.

P is the mud-guard for the front wheel, and these guards O P are supported as usual.

The crank-pin has secured thereto a sprocket-wheel e , and a hub on the rear wheel N has secured thereto a sprocket-wheel e' , and over these sprocket-wheels e and e' a drive-chain f runs, so that by the rotation of the crank-pin from the cranks F, through the treadles F', the sprocket-wheel e will be driven, driving the chain f , which drives the sprocket-wheel e' and rotates the rear wheel N.

The frame formed by the upper and lower sections H and I is a continuous rigid one, and is designed for bicycles ridden by men. For a bicycle to be ridden by a lady the forward portion of the upper section I is to be omitted, forming a frame such as those used for bicycles for ladies.

The standard A is carried by the sleeve B in the construction shown in Figs. 1, 2, and 3, and this sleeve B is carried by the yoke D, and the yoke D likewise carries the sleeve E, with the cranks F and treadles F', and the sprocket-wheel e , and this yoke D is in turn carried by the springs G, so that, in fact, the seat A' and the treadles F' are carried by the yoke D and supported by the springs G, furnishing a yielding support for the seat and treadle which will always maintain these parts in the same relative position. The yoke D, through its springs G, will receive the vibra-

tions and prevent their transmission to the rider, inasmuch as the yoke is entirely disconnected from the rigid frame, so that the vibrations of such frame cannot be transmitted to the yoke, and consequently cannot pass to the rider, and by giving the standard a forward yield through the spring J the bumps of the forward wheel will be taken by the spring J, thereby relieving the rider of the vibration from the forward wheel, as well as from the rear wheel.

The construction shown in Figs. 1, 2, and 3 has the yoke D extending up to meet the sleeve B, thereby forming a pivot between the seat-standard and the yoke to permit of the forward and back swing of the yoke, so as not to affect the standard by any draw thereon from the change in the position of the yoke.

The rider mounts the seat A', which is adjusted properly in the usual manner, and the weight of the rider will carry down the standard A, sleeve B, and yoke D with the treadles F', cranks F, and sprocket-wheel e , thereby maintaining the correct relation for the rider between the seat and the treadles, and the drop of the parts from the weight of the rider will be had until the springs G are under a tension sufficient to support the rider's weight, and when this condition is reached the weight of the rider is carried entirely by the springs, which allows of the necessary yield without transmitting any vibrations to the rider, and in case the springs G are not under sufficient strain for the weight of the rider when adjusted at the upper adjustment the forward end of each spring can be adjusted lower down, as required for the weight of the rider to relieve the vibrations.

The front and rear wheels are connected by a rigid frame, thereby attaining all the benefits of a rigid connection between the wheels, and at the same time the seat is supported clear of this rigid frame, and is therefore not subjected to the vibrations of the frame, as such vibrations are received by the spring G, and as the yoke D, which carries the seat and the driving devices, has no connection with the rigid frame, it follows that such yoke will not receive the vibrations of the frame. This machine has therein all of the advantages possessed by the rigid-frame machine, and is free from the disadvantages of such machine by reason of the yielding support given to the rider through the spring-supported yoke carrying the seat and the driving devices.

A companion spring can be located on the opposite side of the standard A to the spring J, as shown by the dotted line in Fig. 7, to take the rearward thrust or play of the standard. The standard A and the sleeve B can be formed from a single piece, and the forward portion of the frame I can be made removable, so that for the use of a lady it can be taken away, and for a gentleman it can be

secured in position by screws, clamps, or other suitable means, thus enabling the frame to be used with either style of bicycle.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a bicycle, of a standard carrying a seat and hinged intermediate of the seat and treadles, a rigid frame connecting the wheels, and a spring interposed between the rigid frame and the seat-standard for relieving the seat from vibrations and maintaining the standard in a straight-line movement, substantially as and for the purpose specified.

2. The combination, in a bicycle, of a standard carrying a seat, a yoke supporting the standard and carrying the treadles, a jointed connection between the standard and yoke intermediate of the seat and treadles, a rigid frame connecting the wheels, and a spring carrying the yoke, substantially as and for the purpose specified.

3. The combination, in a bicycle, of a standard carrying a seat, a swinging yoke supporting the standard and carrying the treadles and a driving-wheel, a jointed connection between the standard and yoke intermediate of the seat and treadles, a rigid frame, and a spring mounted on the rigid frame and supporting the swinging yoke, substantially as and for the purpose specified.

4. The combination, in a bicycle, of a standard carrying a seat, a rigid frame connecting the wheels, a spring mounted on the rigid frame and supporting the seat-standard, and a spring attached to the seat-standard and holding the standard against forward play, substantially as and for the purpose specified.

5. The combination, in a bicycle, of a swinging yoke having the seat pivotally connected therewith and carrying the driving mechanism and a spring supporting the swinging yoke for giving the seat a straight-line movement and maintaining the seat and treadles

in the same relation, substantially as and for the purpose specified.

6. The standard A, carrying the seat A', sleeve B, and yoke D, in combination with the spring G, supporting the yoke D, and a rigid frame connecting the wheels of the bicycle, substantially as and for the purpose specified.

7. The standard A, carrying the seat A', sleeve B, pivot C, and yoke D, in combination with the sleeve E, spring G, and a rigid frame connecting the wheels of a bicycle, substantially as and for the purpose specified.

8. The standard A, carrying the seat A', sleeve B, pivot C, yoke D, sleeve E, with sprocket-wheel e, cranks F, and treadles F', in combination with the spring G and a rigid frame connecting the wheels of a bicycle, substantially as and for the purpose specified.

9. The standard A, carrying the seat A', sleeve B, pivot C, yoke D, sleeve E, with sprocket-wheel e, cranks F, and treadles F', in combination with the spring G, the spring J, and a rigid frame connecting the wheels of a bicycle, substantially as and for the purposes specified.

10. The swinging yoke D, a seat-standard jointed to the yoke, and a driving mechanism carried by the yoke, in combination with the spring G, supporting the yoke D, and a rigid frame connecting the wheels of a bicycle, substantially as and for the purpose specified.

11. The standard A and swinging yoke D, carrying the driving mechanism of a bicycle and jointed to the standard A, in combination with the spring G, supporting the yoke, and a rigid frame connecting the wheels of a bicycle, substantially as and for the purpose specified.

HARRY C. GOODRICH.

Witnesses:

O. W. BOND,
M. L. PRICE.