

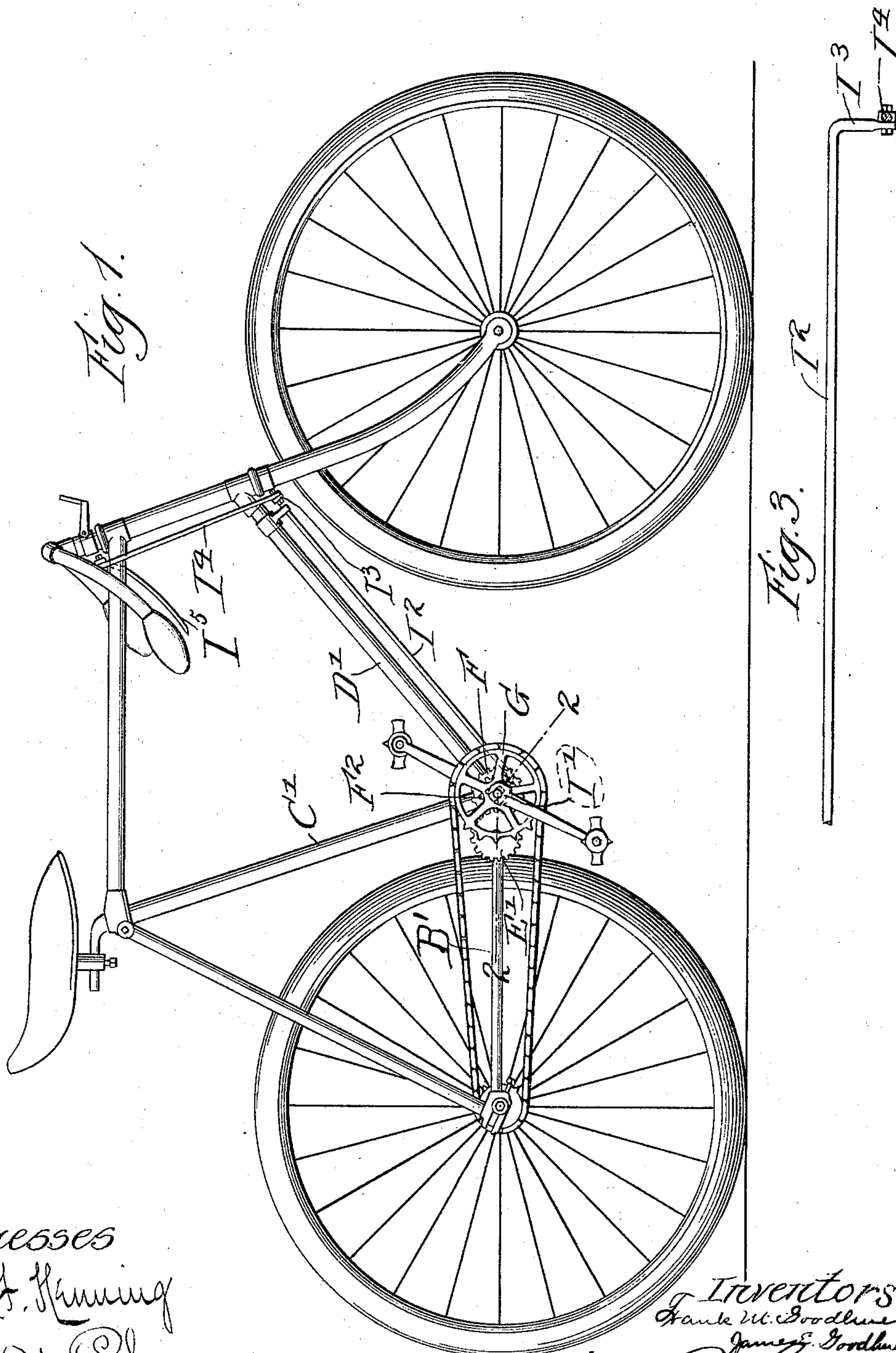
(No Model.)

2 Sheets—Sheet 1

F. M. & J. E. GOODHUE.
BICYCLE.

No. 542,637.

Patented July 16, 1895.



Witnesses

Wm. L. Hanning

Geo. M. Phelps

Inventors
Frank M. Goodhue
James E. Goodhue

by Francis W. Parker, Atty

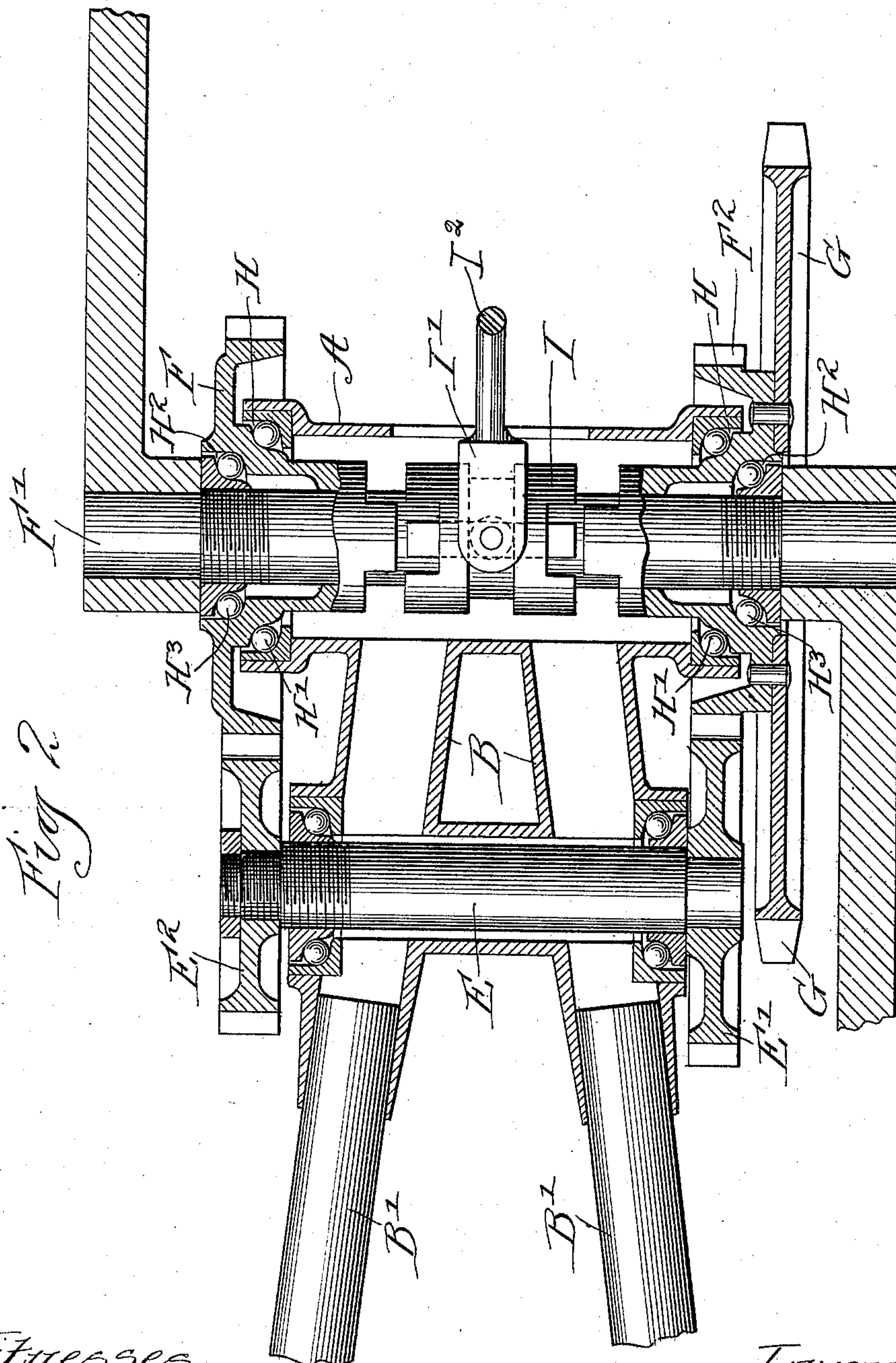
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Frank M. Goodhue
James C. Goodhue
by *Lawrence W. Parker,*
Att'y.

UNITED STATES PATENT OFFICE.

FRANK M. GOODHUE AND JAMES E. GOODHUE, OF ST. CHARLES, ASSIGNORS
TO THE TWO-SPEED BICYCLE COMPANY, OF CHICAGO, ILLINOIS.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 512,637, dated July 16, 1895.

Application filed October 23, 1894. Serial No. 526,711. (No model.)

To all whom it may concern:

Be it known that we, FRANK M. GOODHUE and JAMES E. GOODHUE, citizens of the United States, residing at St. Charles, in the county of Kane and State of Illinois, have invented a certain new and useful Improvement in Bicycles, of which the following is a specification.

Our invention relates to bicycles, and has for its object to produce a new and improved device by which the speed of the bicycle may be varied with relation to the speed of the pedal-shaft.

We have illustrated our invention in the accompanying drawings, wherein—

Figure 1 is a side elevation of a bicycle embodying our invention. Fig. 2 is a section on line 2 2, Fig. 1. Fig. 3 is a detail.

Like letters refer to like parts throughout the several figures.

Our device is preferably used on a bicycle-frame in which the fork of the rear wheel and the seat-post are connected in the usual manner to the sleeve that acts as a bearing for the pedal-shaft. This construction is set forth in the accompanying drawings, wherein is shown the sleeve A provided with the projecting arms B B for the members B' B' of the fork of the rear wheel, and the arms for the seat-post C' and the brace D'. The sleeve A with its projecting arms is preferably forged from one piece and drilled out so as to leave a hollow shell, and thus make the parts as light as possible.

In applying our device to a bicycle, we provide a bearing in each of the arms B B for an auxiliary shaft E. This shaft is provided with the gear-wheels E' E² and works in ball-bearings in the usual manner. The gear-wheel E² meshes with the gear-wheel F, loosely mounted on the pedal-shaft F'. Another gear-wheel F² is loosely mounted on the other end of the pedal-shaft and meshes with the gear E' on the auxiliary shaft E. The sprocket-wheel G is rigidly connected to the gear-wheel F². The gear-wheels F and F² are provided with the external grooves H H for the balls H', which form the ball-bearing between said gear-wheels and the sleeve, and also with the grooves H² H² for the balls H³, which form a ball-bearing between the said gear-wheels and the pedal-shaft F'. Feathered upon the

pedal-shaft F' is the sliding clutch-block I. This clutch-block is moved by means of the bifurcated shifting-arm I'. Said shifting-arm is connected to the rod I² running along the brace D'. The upper end of the rod I² is provided with the projecting arm I³, (see Fig. 3,) to which is pivotally connected the rod I⁴. Said rod I⁴ is connected to the lever I⁵, which is pivotally connected to the handle of the bicycle. By this construction the clutch-block I may be moved by moving the lever I⁵. We have shown a construction by which the clutch-block can be moved by a lever near the hand of the rider, but it will be understood that any other construction that will accomplish the object may be used if desired. It will be seen that by this construction the ordinary form of sleeve for the pedal-shaft may be used, and a light and compact two-speed bicycle produced.

We do not wish to be limited to the exact construction shown, as it is evident that the several parts may be modified to a considerable extent without departing from the spirit of our invention.

The use and operation of our invention are as follows: When the clutch I is moved so as to engage the gear-wheel F², said gear-wheel, and hence the sprocket-wheel G attached thereto, will rotate with the pedal-shaft F'. If now the rider desires to speed up, he moves the lever I⁵ which, through the agency of rod I⁴ and arm I³, rotates the rod I² and moves the shifting-arm I' and clutch I until such clutch engages the gear-wheel F. The motion of the pedal-shaft is then conveyed by clutch I, gear-wheel F, gear-wheel E², shaft E, gear-wheel E', and gear-wheel F² to the sprocket-wheel G, and when the gear-wheels are made as shown in the drawings, the sprocket-wheel will be driven at a greater speed than the pedal-shaft.

It will be seen that we have here a speed-changing device in which there are no gears to be moved out of mesh with each other and which may be easily applied to the ordinary bicycle without adding very materially to its weight. This construction also allows the bearings to be made ball-bearings.

The gear-wheels F and F² are provided with external and internal ball-bearings, the internal ball-bearing being used to decrease the

friction between the pedal-shaft and the gear-wheels when said gear-wheels move at a speed different from that of the pedal-shaft.

We claim—

5 The combination of a bicycle frame, with the usual wheels and a connecting piece at about the point where the pedal-shaft is located, said connecting piece comprising two sleeves rigidly connected by parts of such
10 connection, and sockets or the like for the various forks and rods of the frame, a pedal-shaft in the first mentioned sleeve, two gear-wheels of different sizes toward the ends of the pedal-shaft and loose thereon, bearings
15 therefor in the ends of the sleeve, a sprocket-wheel rigid with one gear, a clutch within the

sleeve between the gears and adapted to slide on but rotate with the shaft, and thus to operatively connect it with either gear, a moving device for the clutch, under the control of 20 the operator, an auxiliary shaft in the other sleeve and thus in rigid relation to the pedal-shaft, bearings therefor within the sleeve and gears of different sizes thereon simultaneously meshing with the gears of the pedal- 25 shaft, substantially as shown and described.

FRANK M. GOODHUE.

JAMES E. GOODHUE.

Witnesses:

F. H. LYMAN,

W. R. GOODMAN.