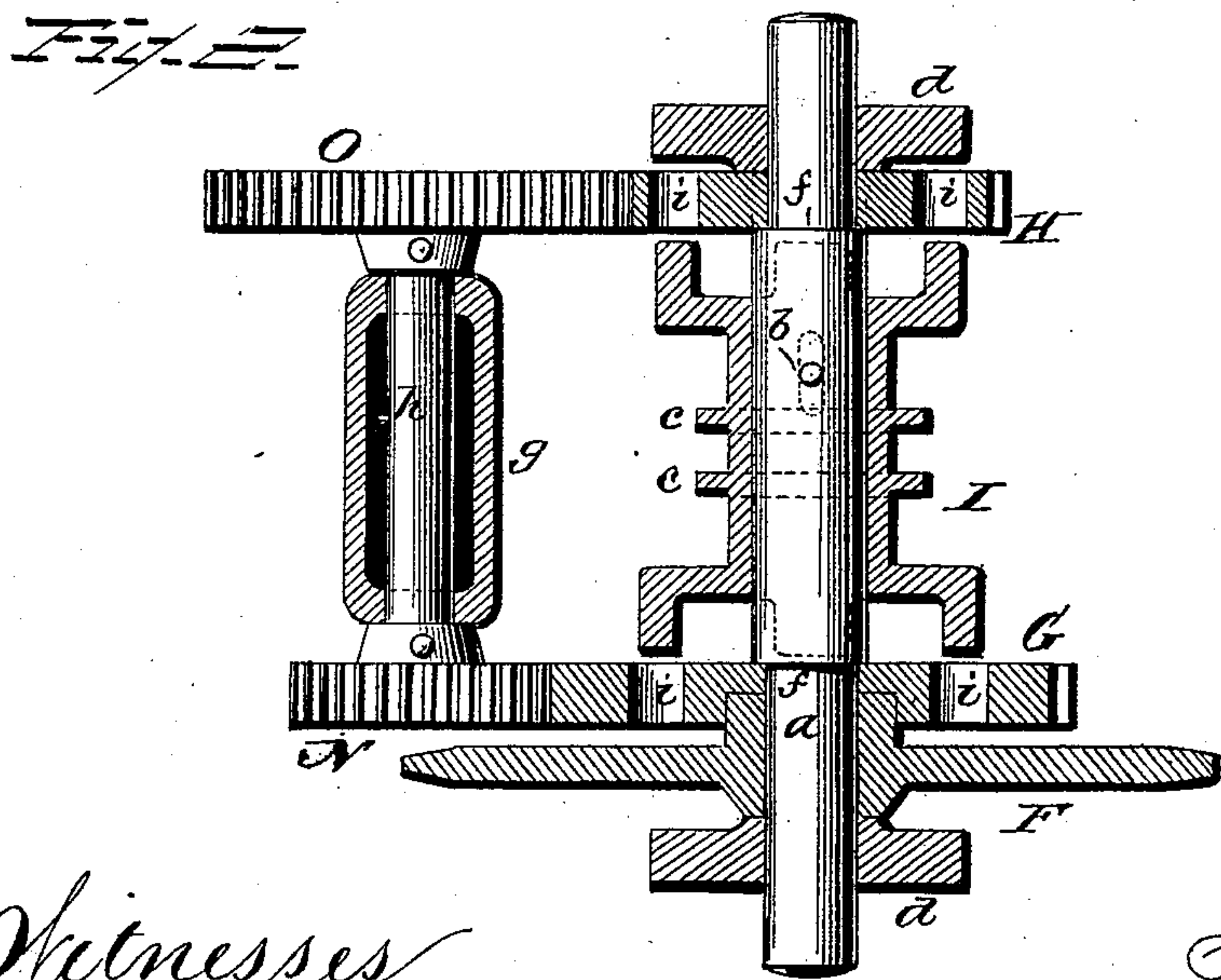
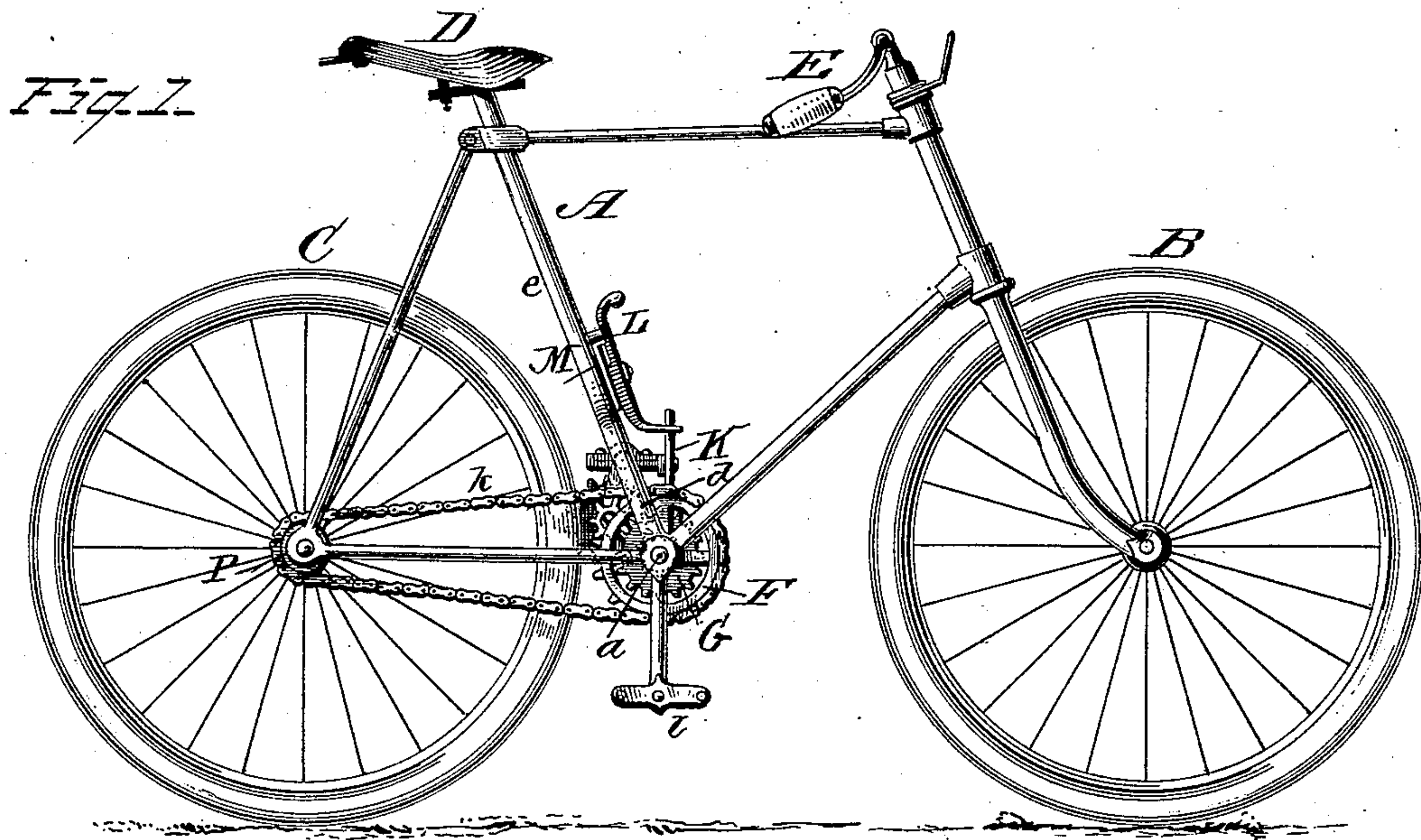


(No Model.)

D. LIPPY & I. E. FINFROCK.  
DRIVING GEAR FOR BICYCLES.

No. 528,957.

Patented Nov. 13, 1894.



Witnesses  
C. Williamson,  
G. Goddard.

Inventors.  
David Lippy,  
Ira Elmer Finfrock  
per Cha. N. Fowler  
Attorney.



# UNITED STATES PATENT OFFICE.

DAVID LIPPY AND IRA ELMER FINFROCK, OF MANSFIELD, OHIO.

## DRIVING-GEAR FOR BICYCLES.

SPECIFICATION forming part of Letters Patent No. 528,957, dated November 13, 1894.

Application filed June 26, 1894. Serial No. 515,743. (No model.)

*To all whom it may concern:*

Be it known that we, DAVID LIPPY and IRA ELMER FINFROCK, citizens of the United States, residing at Mansfield, in the county of Richland and State of Ohio, have invented certain new and useful Improvements in Driving-Gear for Bicycles; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters of reference marked thereon.

The present invention has relation to that class of differential speed mechanism for bicycles in which provision is made for changing the speed and power of the machine to adapt it to the nature or character of the road over which the machine is propelled without the necessity of the rider dismounting and also to enable the pedal-shaft to be disconnected with the gearing when desired to use the machine in "coasting" on down grades.

It is the object of the invention to improve this differential speed-mechanism whereby lightness, strength and durability are secured and the mechanism be simple in construction and easily operated by the rider without dismounting and while the machine is in motion, which objects are attained by the mechanism substantially as shown in the drawings and hereinafter described and claimed.

Figure 1 of the drawings represents a side elevation of a bicycle with our improved differential speed mechanism applied thereto. Fig. 2 represents a plan view of the mechanism on an enlarged scale and partly in section.

In the accompanying drawings A represents the frame of the machine which may be of the usual construction, and B C are the front and rear wheels respectively, said frame having the usual saddle D and provided with the handle-bar E, all of which are of the usual form and construction common with this class of bicycles.

The differential speed mechanism which forms the subject of our invention, consists of the large sprocket-wheel F loosely mounted upon the pedal-shaft *a*, which wheel is keyed or otherwise suitably connected to a gear-wheel G. To the opposite end of the pedal-shaft is loosely mounted a gear wheel H and

between these two gear-wheels is located a double clutch I which is loosely mounted on the pedal-shaft so as to have a sliding motion lengthwise thereof but prevented from turning on its axis by means of a pin *b* extending through the shaft and its ends projecting into elongated slots in the sleeve of the clutch, as shown in dotted lines of Fig. 2. The double clutch I has annular flanges *c* for connecting therewith the usual forked lever K, and to the upper end of the lever is connected a shifting-lever L in convenient position to be operated by the rider without dismounting. This shifting-lever L is pivoted to a notched bracket M upon the bicycle-frame for holding the lever in its adjusted position when moved to either the right or left in operating the double clutch box.

Any suitable or well known means may be employed for operating the double clutch-box as found best adapted to the purpose.

The forked ends *d* of the saddle supporting bar *e* form bearings for the pedal-shaft *a*, said shaft being enlarged at its center to form bearing shoulders *f* for the gear-wheels G and H. A suitable bearing *g* is provided for a short shaft *h*, said bearing being connected to the supporting bar *e* near its lower or forked end in any convenient manner. The shaft *h* has upon its respective ends the gear-wheels N and O which are rigidly connected to the ends of the shaft and move therewith. The gear-wheels N O mesh with the teeth of the gear-wheels G H respectively, the gear-wheels G N being of larger size than the wheels O H so as to make provision for the increase of power or speed as circumstances may require.

When the double clutch is in position shown in Fig. 2, it is disconnected with either of the gear-wheels G H and consequently disconnects the pedal-shaft with the gearing to enable said shaft to remain stationary while "coasting" on down grades. When the clutch is shifted to engage with the openings or holes *i* in the gear-wheel G, said wheel will be locked to the shaft and turn with it, thereby increasing the speed with decreased power. When the clutch is shifted in the opposite direction to engage with the gear-wheel H, the power is increased with less speed. A sprocket-chain *k* connects the sprocket-wheel F with the sprocket wheel P upon the hub of

the bicycle-wheel C, and the shaft *a* has connected with it the usual foot-pedals *l*.

Having now fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

5 A driving gear for bicycles, consisting of a sprocket-wheel loosely mounted upon the end of the pedal-shaft, a large gear-wheel keyed to the sprocket-wheel, a small gear-wheel  
10 loosely mounted upon the opposite end of the shaft, a small and a large gear-wheel upon the ends of a rotary shaft and meshing respectively with the large and small gear-wheels upon the pedal-shaft, a sprocket-chain con-

necting the sprocket-wheel with the sprocket 15 wheel upon the hub of the rear bicycle-wheel, and a slidable double clutch upon the pedal shaft and means for operating it, substantially as and for the purpose set forth.

In testimony that we claim the above we 20 have hereunto subscribed our names in the presence of two witnesses.

DAVID LIPPY.  
IRA ELMER FINFROCK.

Witnesses:

BURTON J. OUSTINE,  
W. H. GIFFORD.