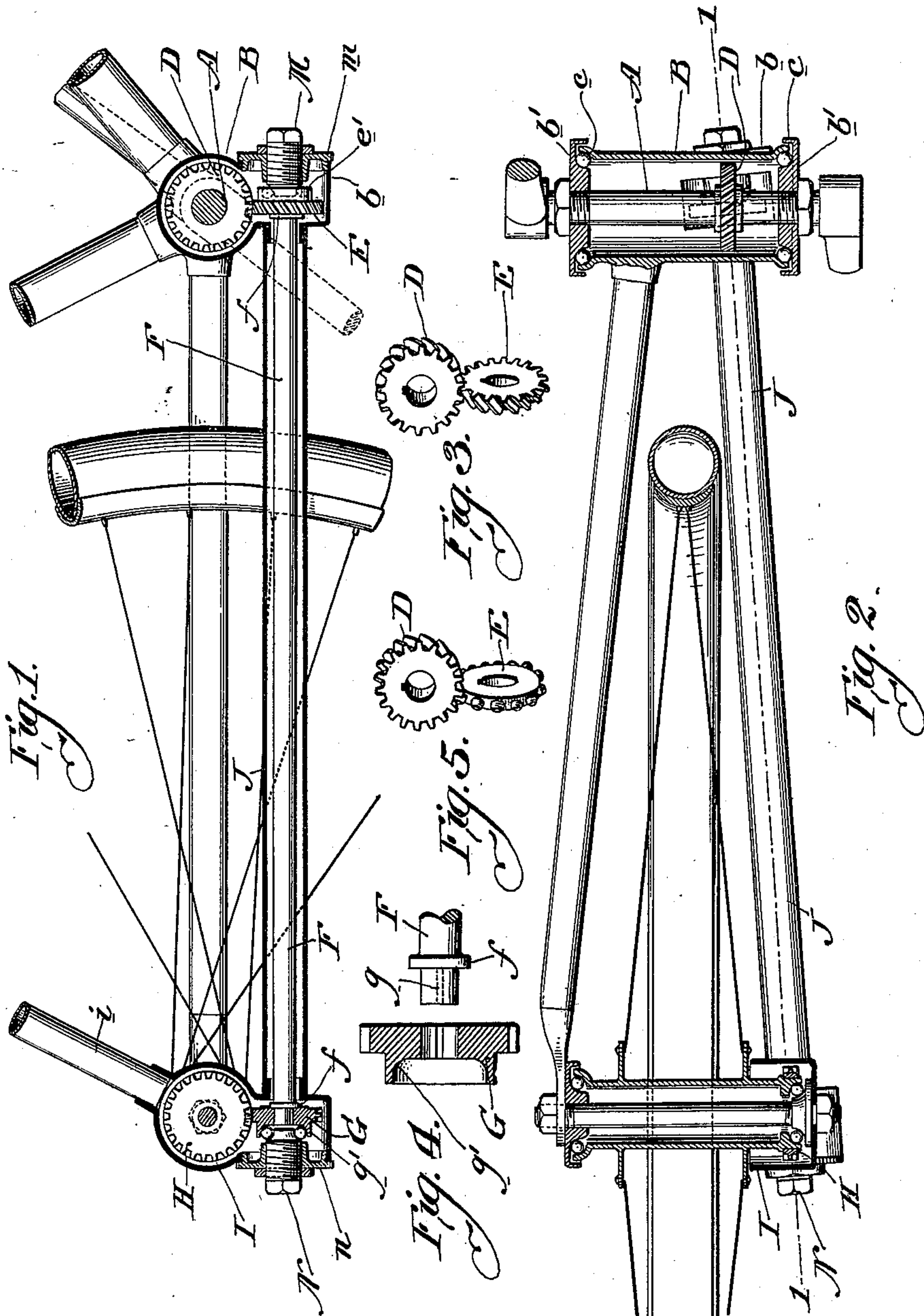


(No Model.)

W. PINCUS.
DRIVING MECHANISM FOR BICYCLES.

No. 599,065.

Patented Feb. 15, 1898.



WITNESSES:
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UNITED STATES PATENT OFFICE.

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DRIVING MECHANISM FOR BICYCLES.

SPECIFICATION forming part of Letters Patent No. 599,065, dated February 15, 1898.

Application filed October 30, 1896. Serial No. 610,543. (No model.)

To all whom it may concern:

Be it known that I, WALTER PINCUS, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Driving Mechanism for Bicycles; and I do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to certain improvements in chainless bicycles, and has for its object to provide a novel form of gearing for connecting the crank-shaft to the rear driving-wheel, as more fully set forth hereinafter.

In the accompanying drawings, Figure 1 is a sectional elevation on the line 1 1, Fig. 2, of a bicycle-gearing constructed in accordance with my invention. Fig. 2 is a sectional plan view of the same. Fig. 3 is a perspective view of one pair of the connecting-gears. Fig. 4 is a partly-sectional view showing one end of the connecting-shaft and one of the gear-wheels detached therefrom, and Fig. 5 is a perspective view illustrating a modified form of gear-wheels.

One of the principal objections to chain-gearing is the accumulation of dirt and grit, which increases the friction to a very considerable extent and which cannot be prevented by any of the ordinary protective casings. The same objection applies to nearly all other forms of gearing connections, owing to the fact that it is very difficult to provide them with a dust-proof covering.

In carrying out my invention I provide an absolutely dust-proof casing for all parts of the gearing, the parts of the casing near the gears being removable, so that the gears may be readily examined or removed.

Referring to the drawings, A represents the crank-shaft, passing through the usual crank-hanger B and provided with adjustable cones *b*, which form, with cups carried by the hanger, the usual ball-races *c*. On this crank-shaft is secured a spiral gear D, which intermeshes with a similar spiral spring E, carried by a horizontal shaft F, extending to the hub of the

rear or driving wheel and there carrying a spiral gear G, intermeshing with a similar spiral gear H on the hub of said wheel. 55

From the hanger B extends a preferably integral casing *b'*, which surrounds the two spiral gears D E, and the rear portion of the frame is provided with a casing I, from which extends a bar *i* to the top of the seat-post. 60 The casing *b'* and the casing I are connected by a tube J, which forms one of the rear bracing-bars and is brazed at each end to sockets in the casings.

Through the tube J extends the shaft F, 65 provided near each end with a collar *f*, and from thence to the ends of shaft are feathers *g* for the reception of the spiral gears E G, as shown more clearly in Fig. 4, each gear-wheel being readily removed from position by sliding it off the end of the shaft. 70

The spiral gears E and G are respectively formed integral with cups *e' g'*, each of which forms part of a ball-race, the opposite half of which is formed by adjusting-screws M N, respectively carried by plates *m n*, screwing into threaded openings in the ends of the casings. 75

The openings in the casings are larger than the diameter of the spiral gears, so that when occasion requires the gears may be readily removed. The shaft F can also be easily drawn from its position in the tube J and all of the parts disconnected when cleaning or repairs are required. This construction enables the rider to change his gears very readily when 85 necessary, and he can carry with him several gears E, having teeth of different inclination, but of the same pitch, any one of which may be placed in position on the end of the shaft F to mesh with the gear D on the crank-shaft. 90

The adjusting-screws M N enable the rider to properly move the shaft F longitudinally and to adjust both the ball-bearings and the position of the shaft.

In a gearing connection such as described 95 all the working parts are inclosed in such manner as to render the entrance of dirt and grit impossible, and all parts may be made of a standard uniform size, so as to be interchangeable. 100

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

The combination on a bicycle, of the rear

driving-wheel hub, the crank-axle, gears on
the wheel-hub and the crank-shaft, gear-cas-
ings carried by the fixed frame of the machine,
a tube J in the form of a rear bracing-bar ex-
5 tending between said gear-casings, removable
end plates *m, n* on said gear-casings, adjust-
ing-screws M, N, carried by said plates, a con-
necting-shaft extending within the tube J,
gears carried by said shaft, each of said gears
10 having a ball-bearing cup adapted to coact

with the ball-bearing surfaces on the ends of
the adjusting-screws M, N, and antifriction-
balls between the cups and the ends of the
screws, substantially as specified.

In testimony whereof I affix my signature 15
in presence of two witnesses.

WALTER PINCUS.

Witnesses:

J. DANIEL EBY,

J. WILLIAM MORGAN.