(No Model.) 2 Sheets—Sheet 1.

F. E. MACMAHON & A. J. POSTANS.

DRIVING GEAR FOR VELOCIPEDES.

No. 588,684. Patented Aug. 24, 1897.

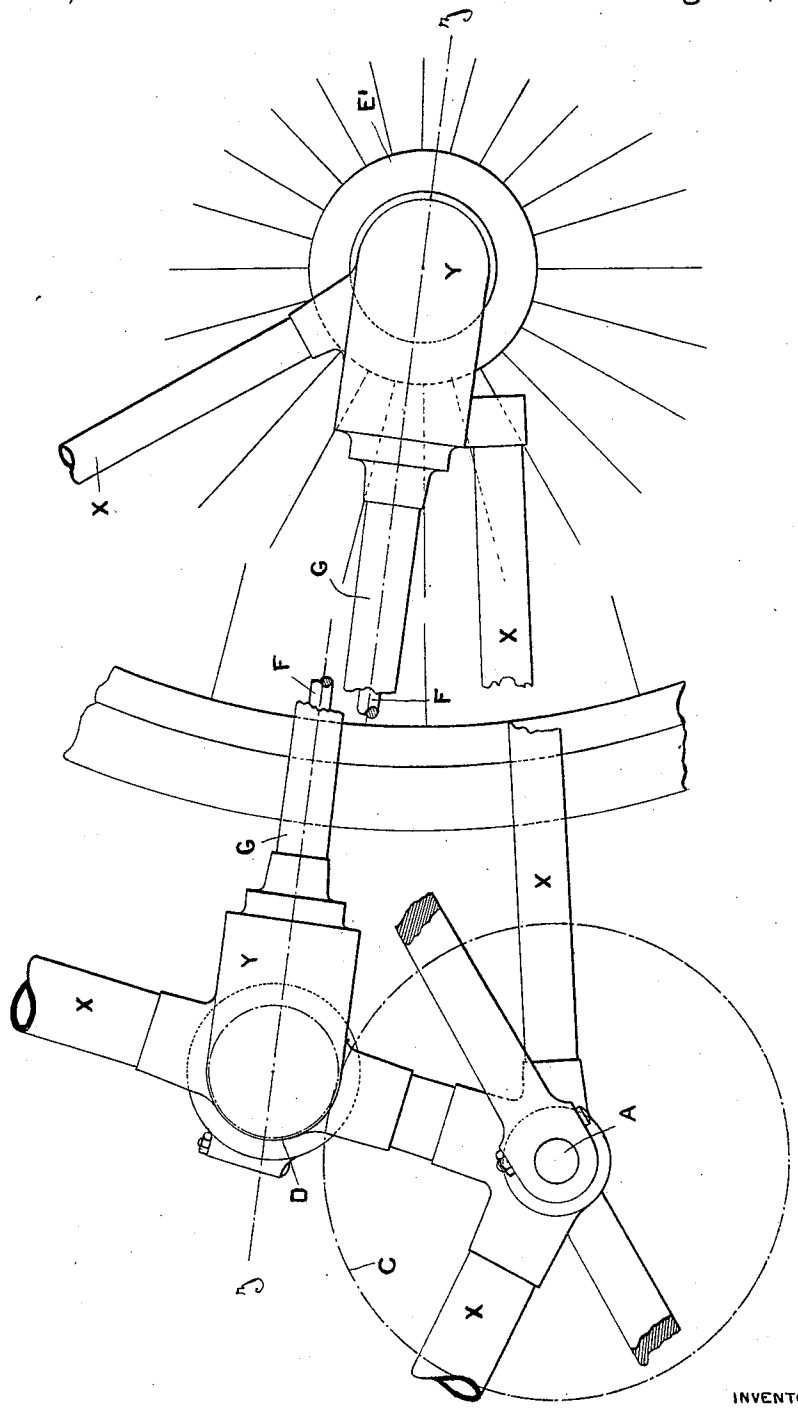


FIG. I.

WITNESSES.
Alfred H. Broad.
William H. James.

INVENTORS.
Francis Edward Macmahon and
Arthur James Postans.
per Robert S. Phillips.
Attorney.

THE NORRIS PETERS CO., PHOTO-LITH., WASHINGTON, D. C.

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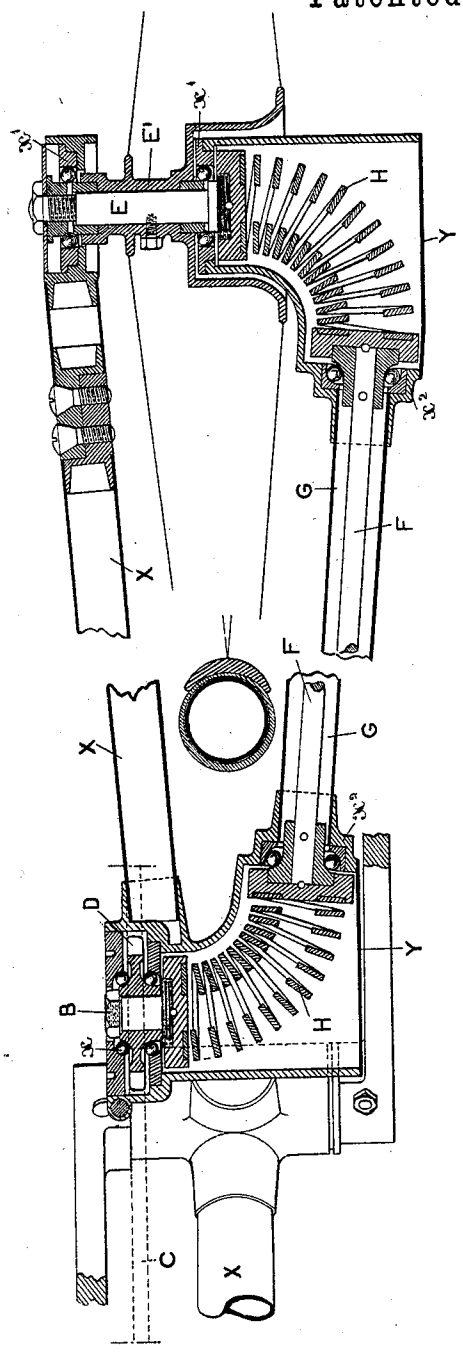


Fig. 2.

WITNESSES.

Alfred K. Broad.

William H. James.

INVENTORS.

Francis Edward Macmahon and

Arthur James Postans.

per Robert B. Phillips.

Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANCIS EDWARD MACMAHON AND ARTHUR JAMES POSTANS, OF LONDON, ENGLAND.

DRIVING-GEAR FOR VELOCIPEDES.

SPECIFICATION forming part of Letters Patent No. 588,684, dated August 24, 1897.

Application filed November 16, 1896. Serial No. 612,352. (No model.) Patented in England February 29, 1896, No. 4,576, and in France December 18, 1896, No. 262,293.

To all whom it may concern:

Be it known that we, FRANCIS EDWARD MACMAHON and ARTHUR JAMES POSTANS, subjects of the Queen of Great Britain, residing at London, in the county of Middlesex, England, have invented a new and Improved Driving-Gear for Velocipedes, of which the following is a full and complete specification.

Letters Patent for this invention have been obtained in England, No. 4,576, dated February 29, 1896, and in France, No. 262,293, dated December 18, 1896.

This invention relates to an improved driving-gear for imparting motion from the pedal-crank axles of velocipedes to the driving wheel or wheels thereof; and it has for its object dispensing with the ordinary chain driving-gear, which has many objections in actual use.

In the accompanying drawings, Figure 1 is a broken view, in side elevation, showing the improved driving-gear applied to the driving-wheel of a bicycle; and Fig. 2 is a broken view, in sectional plan, on line *z z*, Fig. 1.

Similar parts are denoted by like letters of reference in both views.

In a convenient position in close proximity to the pedal-crank axle A—preferably above it, as shown in the accompanying drawings—is a short axle B, mounted in suitable ball-bearings x, carried by the frame X of the machine. Motion is imparted to this secondary or intermediate axle B by means of a spur-wheel C and pinion C′, the relative sizes of which are determined as it is desired to gear the driving-wheel up or down. The hub E′ of the driving-wheel is fixed on an axle E, adapted to run in suitable bearings x', carried by the lower members of the frame X of the machine. Motion is imparted from the secondary or intermediate axle B to the axle E of the driving-wheel by means of an axle F, extending between the ends of the axles B and E on one side of the machine and connected thereto by short flexible shafts H. The axle F is mounted in suitable ball-bearings x^2, carried by the frame X of the machine and is preferably arranged to run in and be inclosed by a tube, such as G. The flexible shafts H are preferably inclosed in suitable cases Y, formed on or attached to the frame X of the machine to protect them from dirt and dust. The flexible shafts preferably take the form of coil-springs, as shown, but any other type of flexible shaft may be used, and they are connected to the ends of the respective axles in any convenient manner, such as that shown by Fig. 2 of the drawings.

The advantages we gain by this system of driving are, first, enabling the driving-wheel and pedal-crank axle to be mounted in the frame at fixed points with respect to each other, as there is no necessity to provide for the adjustment of these parts with respect to one another; secondly, dispensing with the necessity for a dress or chain guard; thirdly, absence of noise or rattle; fourthly, obtaining a slight amount of elasticity between the pedal-crank axle and the driving-wheel, such as is sought to be obtained by spring chain-wheels, elastic driving-wheels, and the like.

We wish it to be understood that the secondary axle B may be mounted in other positions with respect to the pedal-crank axle and that the shaft F may be arranged on whichever side of the machine is found most convenient.

We are aware that it is not new to utilize flexible shafts for transmitting motion from one shaft to another located at right angles to each other, and we do not, therefore, claim such broadly; but

What we do claim, and desire to secure by Letters Patent, is—

The combination, with a bicycle-frame X, two cases Y secured to the said frame and provided with bearings x and x' on one side and bearings x^2 on the other side of the said frame, and a tube G arranged concentric with the bearings x^2 and secured to the said casings; of a shaft F passing through the tube G and journaled in the bearings x^2, a shaft B operatively connected with the crank-axle and journaled in the bearing x, a shaft E journaled in the bearing x', a bicycle-wheel secured on the shaft E, and flexible shafts connecting the respective ends of the shaft F with the shafts B and E, substantially as set forth.

FRANCIS EDWARD MACMAHON.
ARTHUR JAMES POSTANS.

Witnesses:
ROBERT E. PHILLIPS,
ALFRED K. CROAD.