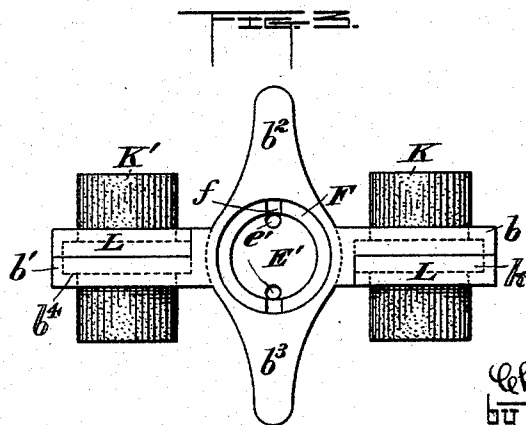
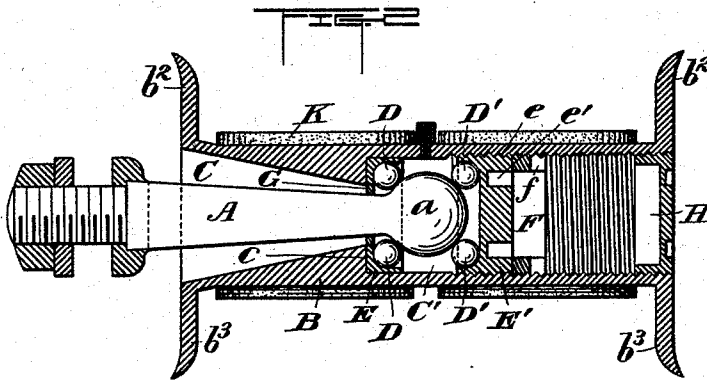
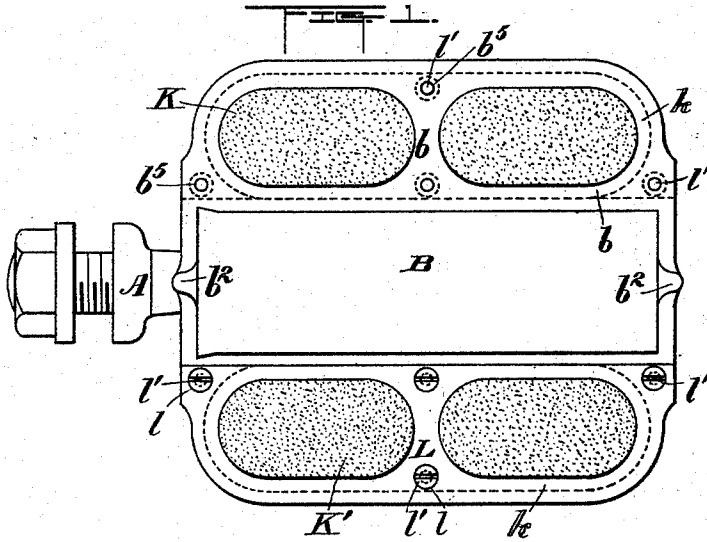


(No Model.)

C. H. DAVIDS.
BICYCLE PEDAL.

No. 527,384.

Patented Oct. 9, 1894.



Witnesses
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UNITED STATES PATENT OFFICE.

CHARLES H. DAVIDS, OF BROOKLYN, NEW YORK.

BICYCLE-PEDAL.

SPECIFICATION forming part of Letters Patent No. 527,384, dated October 9, 1894.

Application filed November 16, 1893. Serial No. 491,092. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. DAVIDS, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Bicycle-Pedals, of which the following is a specification.

My invention relates to an improvement in bicycle pedals in which the pedal is permitted a limited universal movement on its supporting spindle.

In applying pressure by the ball of the foot upon the pedal to drive a wheel, there is a constant tendency for the ball of the foot to work outwardly and press against the outer guard of the pedal, thereby unduly cramping the outside of the foot and having a tendency to render it numb and uncomfortable. There is also a natural tendency of the foot to swing to a greater or less extent in a horizontal plane during its circular movement with the pedal in a vertical plane, and this slight tendency to swing horizontally requires either that the ball of the foot twist on the surface of the pedal or that the ankle be restrained from adapting itself to the movement which is most natural to it.

My present invention is directed to improvements in connection with a pedal which, because of its limited universal movement on the spindle will adapt itself squarely to the downward pressure exerted upon it and will, at the same time, move freely in a horizontal plane sufficiently to permit the foot to adjust itself naturally as it moves around with the pedal.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 is a top plan view of the pedal. Fig. 2 is a transverse central section of the same, and Fig. 3 is an end view with the dust cap removed.

The pedal supporting spindle, which may be adapted to an ordinary driving crank of bicycles now in common use, is denoted by A and is preferably made of a length slightly greater than one-half the width of the pedal. The outer end of the spindle A is developed into globular form, as indicated at *a* and on this globular, outer end of the spindle the pedal is mounted.

The pedal comprises a central tubular portion B, provided with wings *b* and *b'* projecting to the front and rear of the tubular portion and with guards *b*² and *b*³ projecting upwardly and downwardly at the inner and outer ends of the tubular portion. The inner end of the tubular portion B is provided with a conical shaped bore C, gradually contracting in size from the inner end of the tubular portion toward the central portion thereof, reaching its smallest diameter at a point a short distance inwardly from the globular end *a* of the spindle, at which point the bore of the tubular portion B abruptly increases in size, forming a shoulder *c* facing toward the outer end of the tubular portion and from this point to the outer end of the tubular portion a uniform bore C' extends. It is intended that the globular portion *a* of the spindle shall have a greater diameter than the smallest portion of the conical bore C and that it shall have a diameter less than the diameter of the uniform bore C'.

The connection of the pedal with the spindle is effected by means of two sets of ball bearings, the balls D of one set being held in position between the face of a bearing box E, seated at the inner end of the bore C' and the curved surface of the globular head *a*, on the side toward the crank; and the balls D', of the other set being held between the face of the bearing box E', secured in the bore C' and the outer curved face of the globular head *a*. The bearing box E may be simply slid into position with a close sliding fit, while the bearing box E' may be provided with an external screw thread *e* adapted to register with an internal thread formed on the wall of the bore C'. A check nut F, in the form of a ring with a screw thread on its exterior is fitted to screw within the bore C' against the outer end of the bearing box E' and for purposes of screwing and unscrewing the check nut F and bearing box E', I provide the latter with a pair of sockets *e'* and the former with a pair of notches *f* to receive the points of a wrench.

To keep any flying dust or foreign substance from the ball bearings, I provide the narrow neck of the conical bore C with a washer G which may be located near the globular head *a* and formed of some suitable flexible mate-

rial so that it will not materially interfere with the rocking movement of the pedal on the head *a* to an extent permitted by the space between the spindle and the interior wall of the bore C. To prevent dust and foreign substance from catching in the screw-threads within the bore C', I find it desirable to provide a dust cap H which may be inserted in the outer end of the bore.

The rubbers for receiving the contact of the foot with the pedal are denoted by K and K' and are conveniently molded in sections connected by a surrounding rib *k* so that when the sections are inserted through the skeleton wings of the pedal, the rib *k* will rest in a recess *b*⁴, formed around the inner margin of the wing and the said rubber is locked in position by a skeleton locking plate L adapted to conform to the shape of the wing and provided with perforations *l* to receive the clamping screws *l'* which, after passing through the perforations in the locking plate, enter threaded perforations *b*⁵ in the wing.

By the above construction, I am enabled to make the spindle very strong and still keep its weight less than the long spindle at present in use, while the pedal itself is permitted to assume such positions as may be required to adapt itself to the positions which the foot would most naturally assume when operating the pedal and at the same time the structure is so simple and free from complications that it may be readily examined and kept in proper

working order without liability of derangement.

What I claim is—

1. In combination, a crank spindle provided with a globular head, a pedal having a tubular portion provided with a taper bore throughout a portion of the length of the tubular portion and with a regular bore throughout the remainder of the tubular portion, ball bearing boxes seated within the bore in position to receive opposite sides of the globular spindle head between them, and ball bearings inserted between the bearing boxes and the globular spindle head, substantially as set forth.

2. The combination with a crank spindle provided with a globular head, of a pedal, comprising a central tubular portion and skeleton wing portion extending in opposite directions from the tubular portion, the tubular portion being provided with a bore regular throughout a portion of its length and conical throughout a portion of its length, the regular portion being provided with an internal screw thread, bearing boxes fitted to the interior of the bore, rubbers fitted to the wings and clamping plates to hold the rubbers in position, substantially as set forth.

CHAS. H. DAVIDS.

Witnesses:

FREDK. HAYNES,
R. B. SEWARD.