

No. 701,028.

Patented May 27, 1902.

W. H. FAUBER.
BICYCLE PEDAL.

(Application filed Mar. 7, 1898.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1

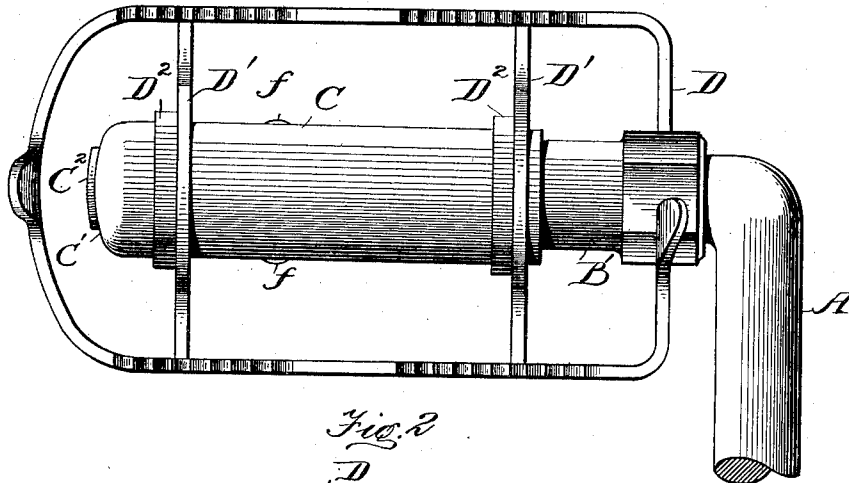


Fig. 2

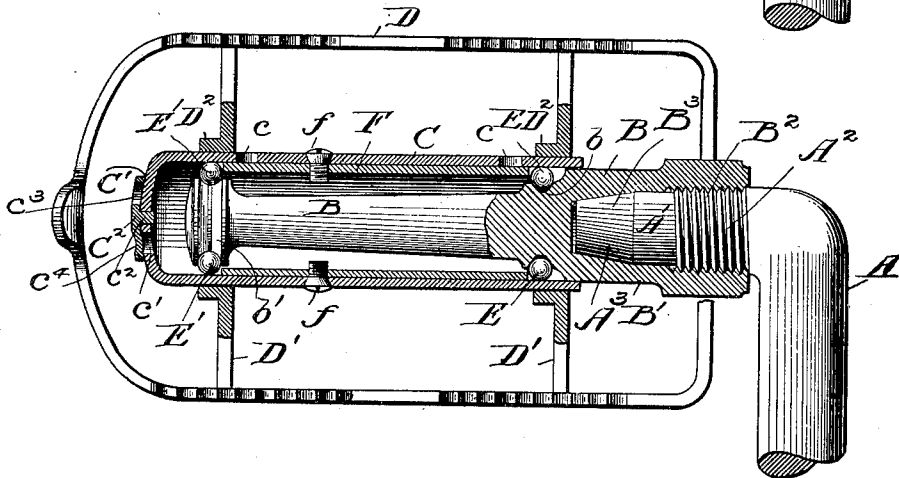
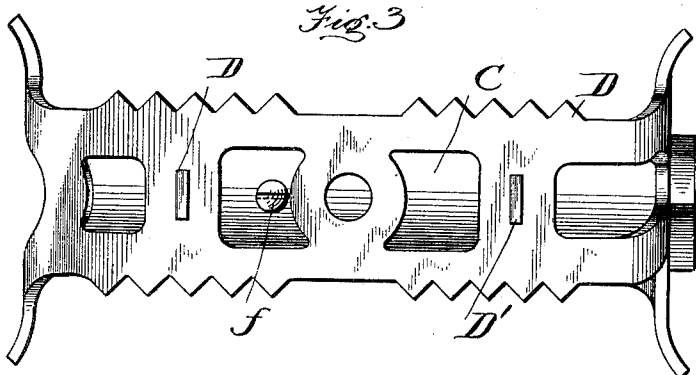


Fig. 3



Witnesses

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2 Sheets—Sheet 2.

Fig-4

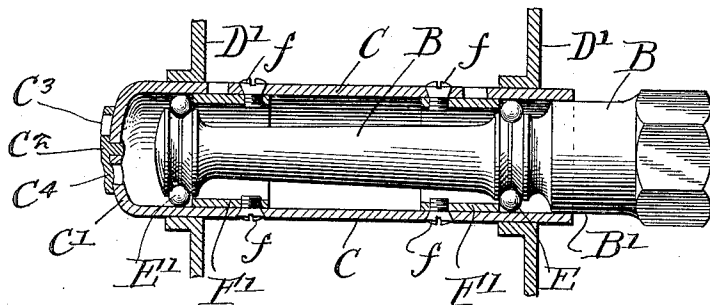


Fig-5

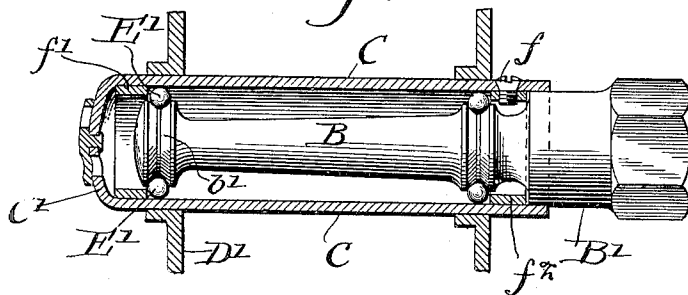
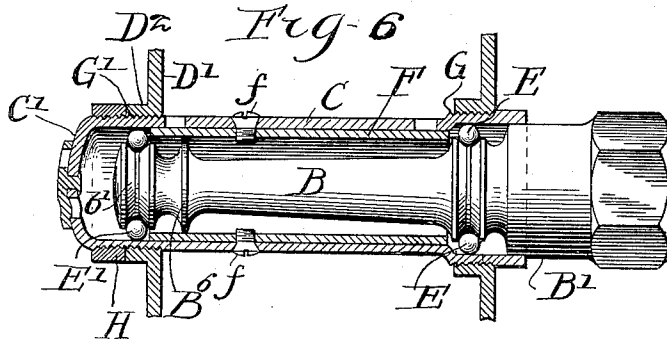


Fig-6



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UNITED STATES PATENT OFFICE.

WILLIAM H. FAUBER, OF CHICAGO, ILLINOIS.

BICYCLE-PEDAL.

SPECIFICATION forming part of Letters Patent No. 701,028, dated May 27, 1902.

Application filed March 7, 1898. Serial No. 672,976. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. FAUBER, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Bicycle-Pedals; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in pedals for bicycles and like vehicles.

The invention consists in the matters hereinafter described, and pointed out in the appended claims.

As illustrated in said drawings, Figure 1 is a plan view of a pedal embodying my invention. Fig. 2 is a similar view with the principal parts thereof shown in axial section. Fig. 3 is a side view showing mainly the construction of the pedal-frame. Fig. 4 is a detail section illustrating a modified construction of the parts which form the bearing-shoulders within the tubular body of the pedal. Fig. 5 is a similar section showing still another modification of the same parts. Fig. 6 is a similar section showing a screw-threaded connection between the said tubular body and the cross-pieces of the pedal-frame.

As shown in said drawings, A indicates the outer end of the crank-arm to which the pedal is attached; B, the central spindle of the pedal which is immediately attached to said crank-arm; C, the tubular body of the pedal; D, the pedal-frame or that part upon which the foot of the rider rests, said frame including transverse members D' D', by which the external part of the frame is connected with and supported from the tubular body C. The spindle B is non-rotative and rigidly attached to the crank-arm A, and the tubular body C is mounted to rotate on said spindle and is supported thereon by means of ball-bearings. First referring to the construction of said tubular body C and the bearings by which it is mounted on the spindle B these parts constitute one feature of my invention, and the same are made as follows: In the said spindle, near the inner and outer ends thereof, are formed two bearing-grooves *b b'*

to receive a plurality of roller-balls, (indicated by E E',) said grooves being of V shape or of other form adapted to retain the balls from movement with respect to the spindle in a direction endwise of the same. Said spindle is shown as made solid and tapered on its exterior surface between the ball and the grooves; but it may for lightness be made hollow or tubular, if desired. The said tubular body C is made cylindric on its inner surface and is of an internal diameter equal approximately to a circle touching the outer parts of the balls when within the bearing-grooves, the intent being that the cylindric inner surface of the said tubular body should form the bearing-surfaces which are in contact with the said balls. Within the said tubular body is located a closely-fitting sleeve or tube F of a length approximately the same as the distance between the adjacent faces of the two sets of balls E E'. Said sleeve when the parts are assembled is secured within the tubular body C between the two sets of balls in such manner that its end surfaces form, in effect, two bearing-shoulders adapted for contact with one or the other of the sets of balls in case there is any tendency to endwise movement of the tubular body and to thereby retain the tubular body in proper position with respect to the central spindle. The said sleeve F may be secured within the tubular body by any form of fastening device which is accessible or separable from the exterior of the tubular body, the securing device herein shown consisting of screws *ff*, which are inserted through the said shell or tubular body and into the inner sleeve. Said screws are shown as provided with conical heads adapted to engage countersunk holes in the tubular body, so as to obviate liability of the same being easily loosened and falling out. To prevent access of dust to the ball-bearing, the outer end of the tubular body C is closed by an end wall C', the same being herein shown as made integral with the tubular body, which may conveniently consist of a drawn-metal shell of cylindric form having a solid or integral end wall. At the inner end of the tubular body the latter is made to fit closely around the enlarged part or hub B' of the spindle, by which said spindle is attached to the crank-arm,

said hub being herein shown as provided with a cylindric outer surface of approximately the same diameter as the interior diameter of the tubular body, and the tubular body being shown as overlapping said cylindric part or surface, it being of course understood that the tubular body is free from actual contact with said cylindric part, but is at the same time fitted so closely thereto as to avoid liability of the entrance of dust or dirt between the parts at this point.

Provision is made for inserting the balls within the bearing-grooves $b\ b'$ and between the same and the tubular body C, consisting of holes $c\ c$ of suitable size for the passage of such balls, which holes are located adjacent to the grooves, but in position to be covered by the sleeve F when the latter is secured in place. The operation of assembling the parts when said holes are present is performed as follows: The sleeve F is first inserted loosely in the tubular body and the latter then slipped over the spindle B. Said sleeve is first shifted endwise, so as to uncover one of the holes c and the tubular body moved endwise until brought opposite one of the grooves. The balls are then inserted through the uncovered hole until the groove is filled. The tubular body is then shifted to bring the second hole opposite the unfilled ball-groove and the sleeve F at the same time shifted endwise to uncover the second hole, through which the balls are inserted as before. When both sets of balls have been inserted, the sleeve will be confined between them and held from endwise movement; but the tubular body will be shifted with respect to the sleeve until both holes $c\ c$ are covered and the sleeve is in position for the insertion of the fastening-screws f . The holes c are not, however, essential, it being obvious that the parts may be assembled by first placing the sleeve F over the spindle B, then placing the tubular body with its margin around the outermost groove b' and in such position that the balls may be placed therein, then sliding the body inwardly over the spindle and sleeve until the margin of its open end is opposite the inner ball-groove b , then inserting the balls in the latter groove, and thereafter shifting the tubular body farther inward until brought into proper position with respect to the spindle and sleeve. The employment of the hole c is preferred, however, as it considerably facilitates the operation of inserting the balls.

To provide means for oiling the bearings, the closed outer end wall D' of the tubular body is provided with an oil-opening c' , and to said end wall is secured a rotating cover or disk C², which is attached to the wall by means of a centrally-pivoted stud c^2 . The disk C² will be provided at one side with an opening c^3 , which by the turning of the disk may be brought opposite the opening c' , so as to admit the end of an oiler to the interior of the tubular body. For the purpose of holding the said disk from rotation in a position

to close the oiling-orifice said disk will be provided with a depressed portion c^4 , adapted to engage the orifice c' when the disk is turned to a position to bring the depressed portion opposite the orifice, the said disk being made of relatively thin flexible metal, so that said depressed portion may be easily sprung out of the orifice in turning it for the purpose of opening the same.

The cross-bars D' of the pedal-frame are shown as centrally apertured for the passage of the tubular body C and as having the apertures thereof surrounded by annular flanges D², which fit closely upon the tubular body and afford means by which the cross-bar may be firmly secured to said body by brazing or otherwise. The exterior part D of the frame is shown as consisting of a single piece or strip of metal which is bent to form two parallel bars, on which the foot of the rider rests, and an outer connecting-piece, which extends over the outer end of the tubular body, the inner ends of the said strip D being bent inwardly and so shaped as to terminate at the opposite sides of the spindle B, as clearly seen in the drawings, Fig. 1.

Obviously the annular bearing-sleeve, which by contact with the balls holds the tubular body from endwise movement on the spindle, may be formed by separate sleeves or wings inserted and secured within the tubular body instead of being formed by the ends of a single sleeve. A construction of the kind referred to is shown in Fig. 4, wherein the tubular body is provided with two sleeves F' F', interposed between the two sets of balls and the ends of which form the shoulders referred to. In Fig. 5 is shown still another modification in which the tubular body C is provided with a stationary or immovable shoulder f' , which may be formed in the metal of the body or by a separate ring inserted therein, and a single short sleeve or ring f , which is inserted into the open end of the body and therein secured, with its inner end adjacent to the bearing-balls.

In Fig. 6 I have shown a construction in which the cross-pieces of the pedal-frame have screw-threaded connection with the tubular body of the pedal, the purpose of this construction being to enable the parts to be easily assembled in the first instance and also to enable the pedal-frame to be easily replaced without disturbing the other parts of the pedal in case it becomes broken, bent, or injured and to enable frames of different sizes—as, for instance, those adapted either for a man or woman—to be applied at will to the same tubular body and bearings. As shown in said Fig. 6, the shell or body C of the pedal is enlarged in diameter in its part adjacent to the inner bearing-balls, and said enlarged part is provided with screw-threads G. Similar screw-threads G' are formed upon the outer end of the tubular body, such screw-threads preferably extending inwardly from the extreme outer end thereof. The cylindric flange

D² of the cross-pieces D' are in this instance made of proper size to fit upon the inner and outer ends of the tubular body and are screw-threaded to engage the screw-threads G and G'. Where the outer screw-threads G' reach to the end of the tubular body, a locking-ring or jam-nut H may be conveniently applied to the screw-threaded part outside of the flange D², so as to cover the screw-threads at that point and give a smooth finish to the parts, while at the same time locking the frame from possibility of unscrewing. The locking-ring H is not, however, essential, and if it be omitted the extremity of the tubular body outside of the cylindric flange D² may be reduced in diameter, so as to give a smooth cylindric surface and to permit the said flange to be slipped over the end of the tubular body in which it reaches or comes into engagement with the said screw-threaded part G'. It will be seen from said Fig. 6 that the interior cylindric surface of the tubular body need not be of the same diameter throughout its entire length, but that the cylindric bearing-surface for the innermost set of balls, or those nearest the crank-arm, may be larger in diameter than the cylindric bearing-surface for the outermost set of balls. It is therefore to be understood that the term "cylindric inner surface" employed in the appended claims does not indicate a construction in which the surfaces in contact with the bearing-balls are of uniform diameter.

It is to be understood that the bearing herein illustrated may be adapted to other uses than bicycle-pedals, and I do not wish to be restricted to such use.

Preferably the outer end of the spindle adjacent to the outer ball-groove of each of the constructions described will be provided with an annular guide-flange B⁶, Fig. 6, so as to center the spindle within the tubular body and prevent the balls from escaping around the end of the spindle when being inserted into place.

The sleeves and rings which engage the roller-balls and are attached to the tubular body C to prevent endwise movement of said body on the spindle may each consist of a split tube formed by bending a piece of flat metal to proper form, thereby cheapening the cost of making the same.

I claim as my invention—

1. The combination with a grooved supporting-spindle the groove of which is constructed to confine bearing-balls from endwise movement of the spindle, of a tubular body surrounding the spindle and provided with a cylindric inner surface, bearing-balls in said groove in contact with the inner surface of said tubular body, an annular part having a bearing-shoulder removably secured within said body and adapted for contact with the

balls to hold the tubular body from endwise movement relatively to the spindle.

2. The combination with a supporting-spindle grooved at each end, the grooves of which are constructed to confine bearing-balls from endwise movement of the spindle, a tubular body surrounding the spindle and having a cylindric bearing-surface, two sets of bearing-balls inserted in said grooves and bearing against the inner or cylindric surface of the tubular body, and a sleeve movably secured within the tubular body between the two sets of balls and the ends of which form bearing-shoulders which bear against the balls.

3. A pedal, comprising a supporting-spindle provided with ball-grooves, a tubular body surrounding the spindle and having cylindric inner surface, bearing-balls inserted in said grooves and bearing against the inner cylindric surface of the tubular body, and a sleeve movably secured within the tubular body between the two sets of balls and the ends of which form bearing-shoulders to hold the sleeve from endwise movement, said body being provided with holes for the insertion of the balls, which holes are located in position to be covered by the sleeve when the same is secured in place within the tubular body.

4. The combination with a supporting-spindle provided at its ends with ball-grooves constructed to confine the balls from endwise movement of the spindle, a tubular body having a cylindric inner bearing-surface, bearing-balls inserted in said grooves in contact with said cylindric bearing-surface, said body being provided with holes for the insertion of the balls within said grooves when the spindle is contained in the body, and means engaging the balls when the parts are assembled to hold the body from endwise movement of the spindle, said means being constructed to close said holes.

5. The combination with a supporting-spindle provided at its ends with ball-grooves constructed to confine the balls from endwise movement of the spindle, balls inserted in said grooves, a tubular body slipped over the spindle having a cylindric inner bearing-surface with which said balls have contact, a guide-flange at the outer end of the spindle designed to center the spindle in the tubular body when being inserted therein to prevent the escape of balls around the end of the spindle, and means for holding the body from endwise movement of the spindle.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 2d day of March, A. D. 1898.

WILLIAM H. FAUBER.

Witnesses:

WILLIAM L. HALL,
TAYLOR E. BROWN.