(No Model.) 2 Sheets—Sheet 1.

J. S. COPELAND.

PEDAL.

No. 527,520. Patented Oct. 16, 1894.

Fig. 1.

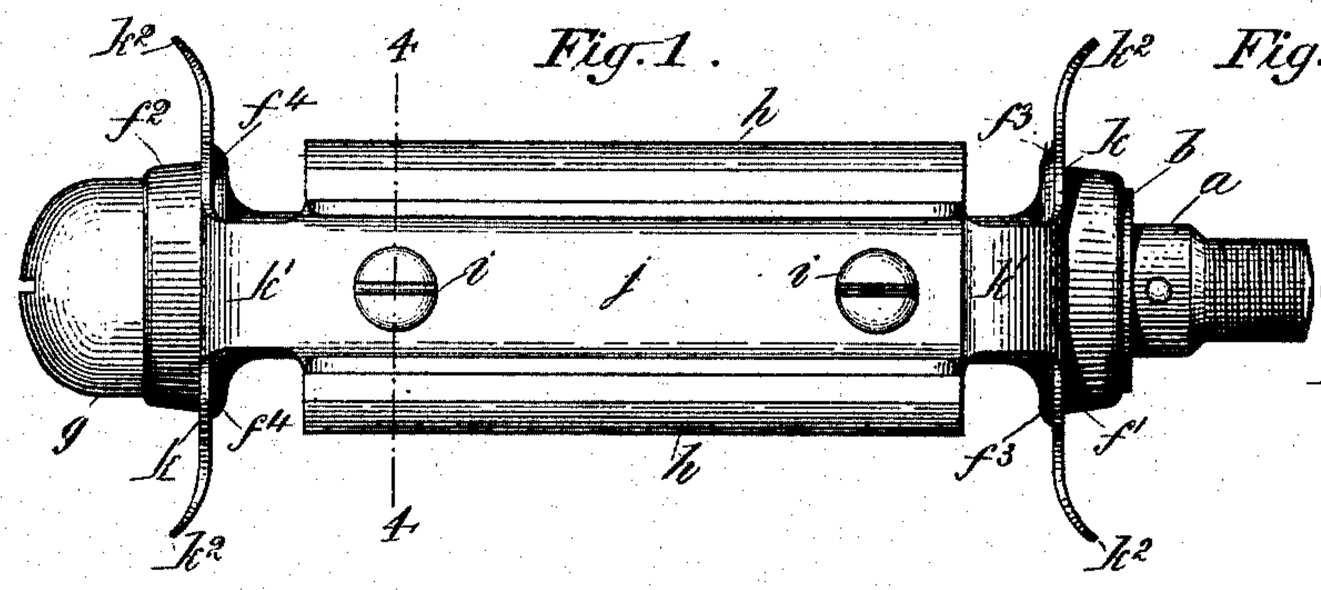


Fig. 2.

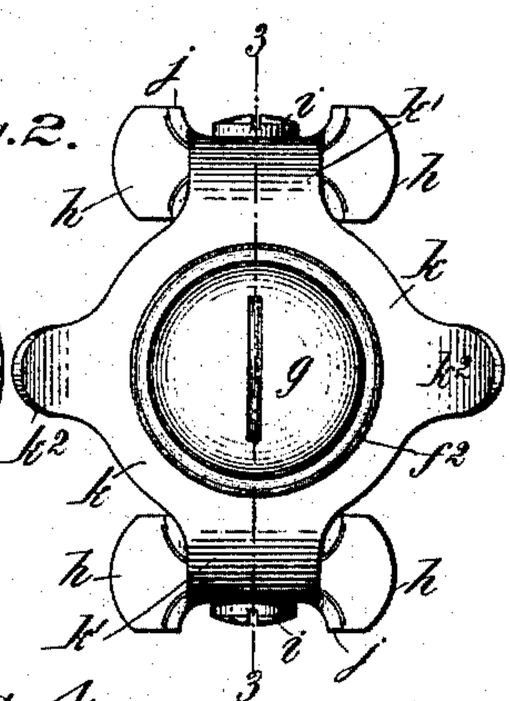


Fig. 3.

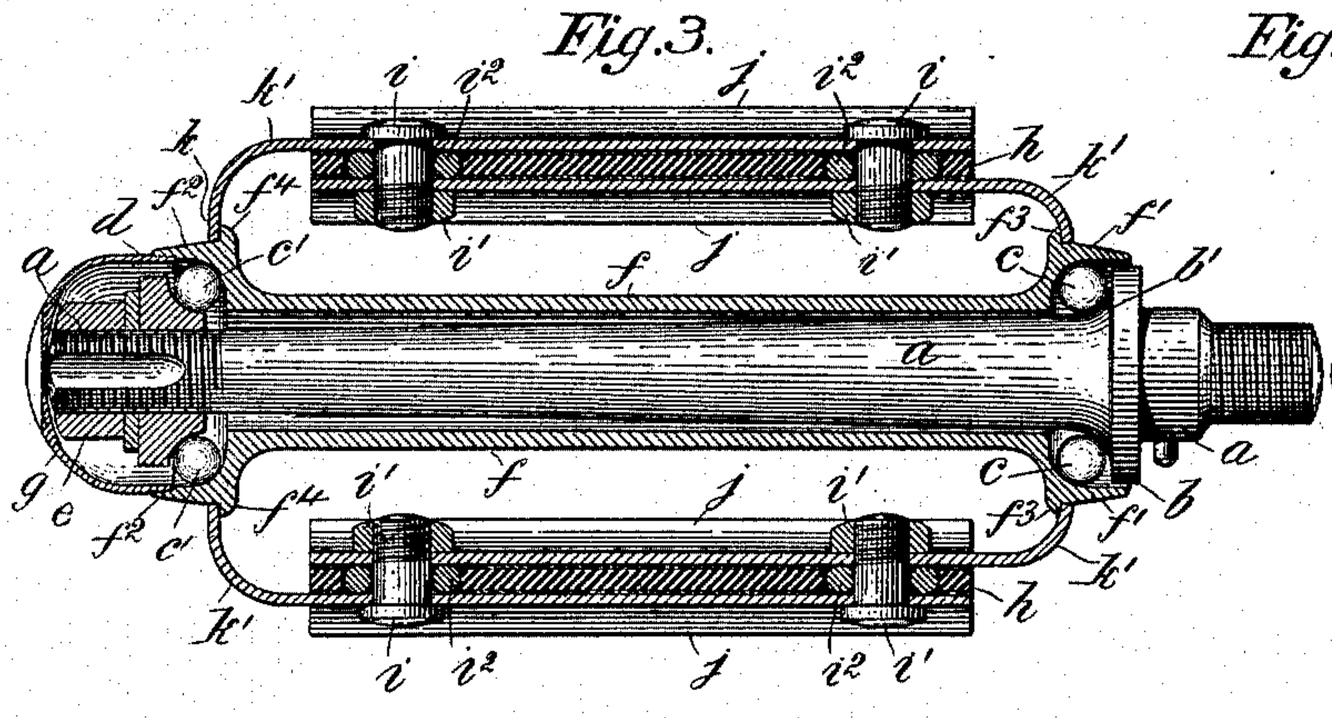


Fig. 4

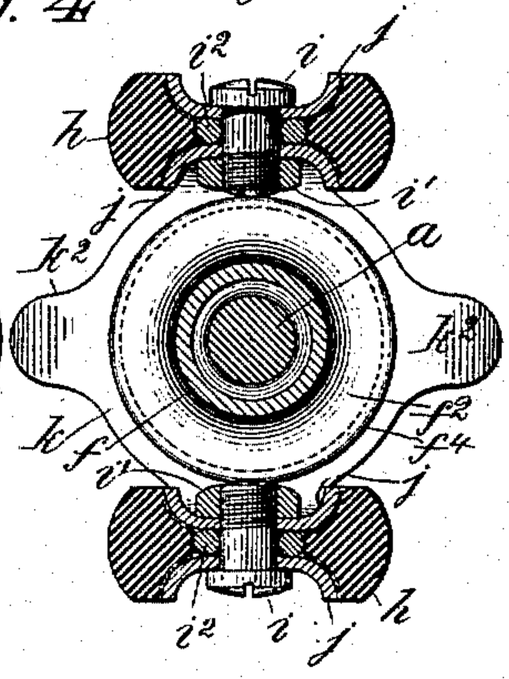


Fig. 5

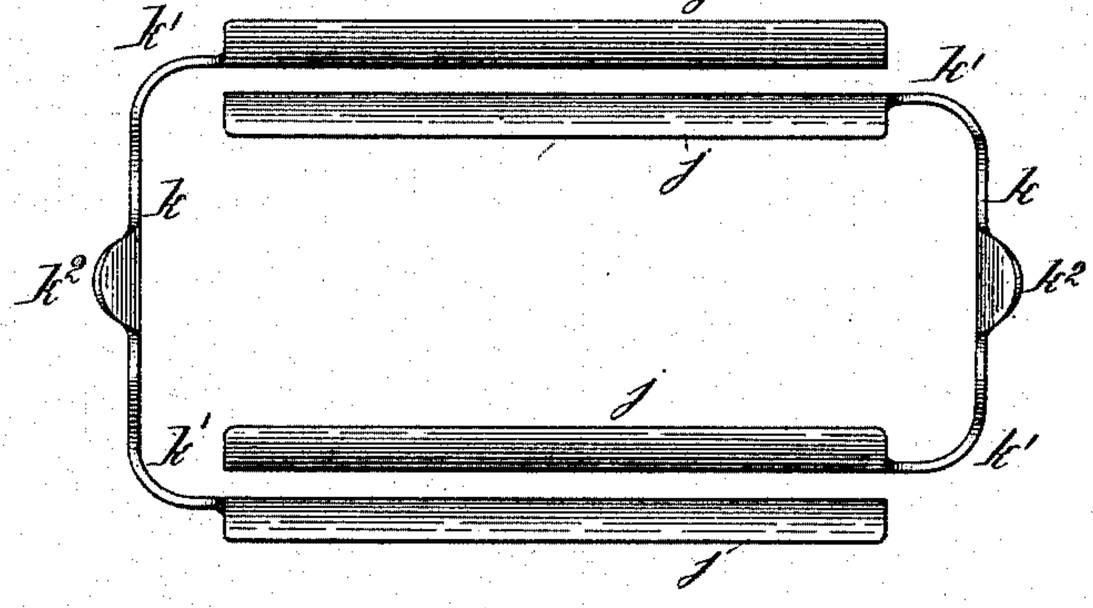


Fig. 6

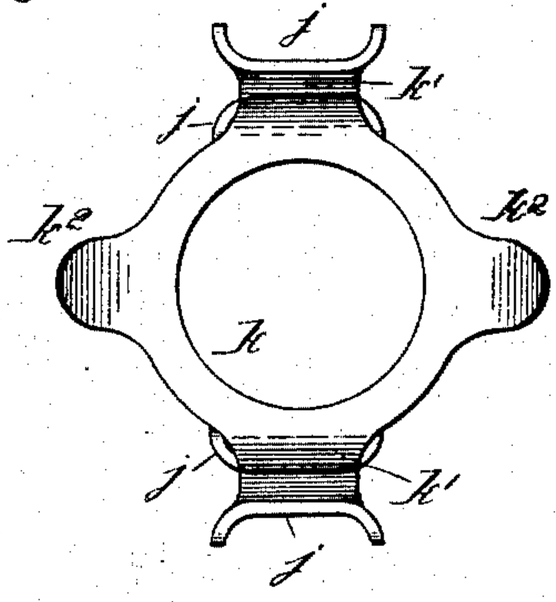


Fig. 7

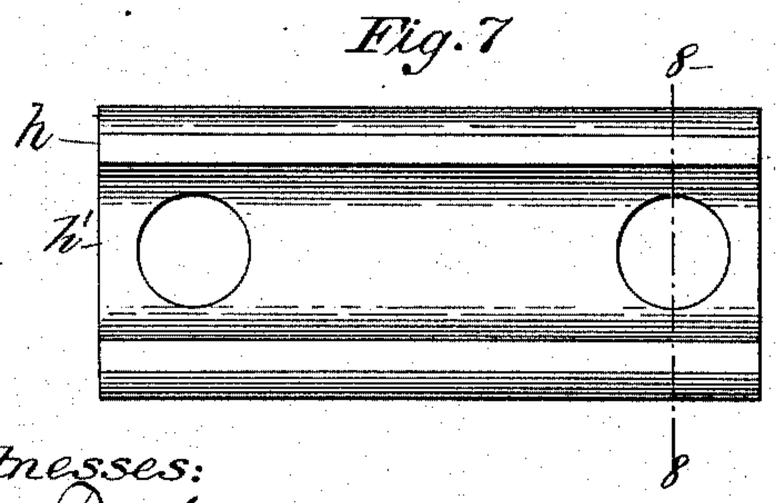
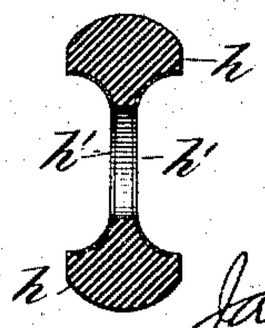


Fig. 8



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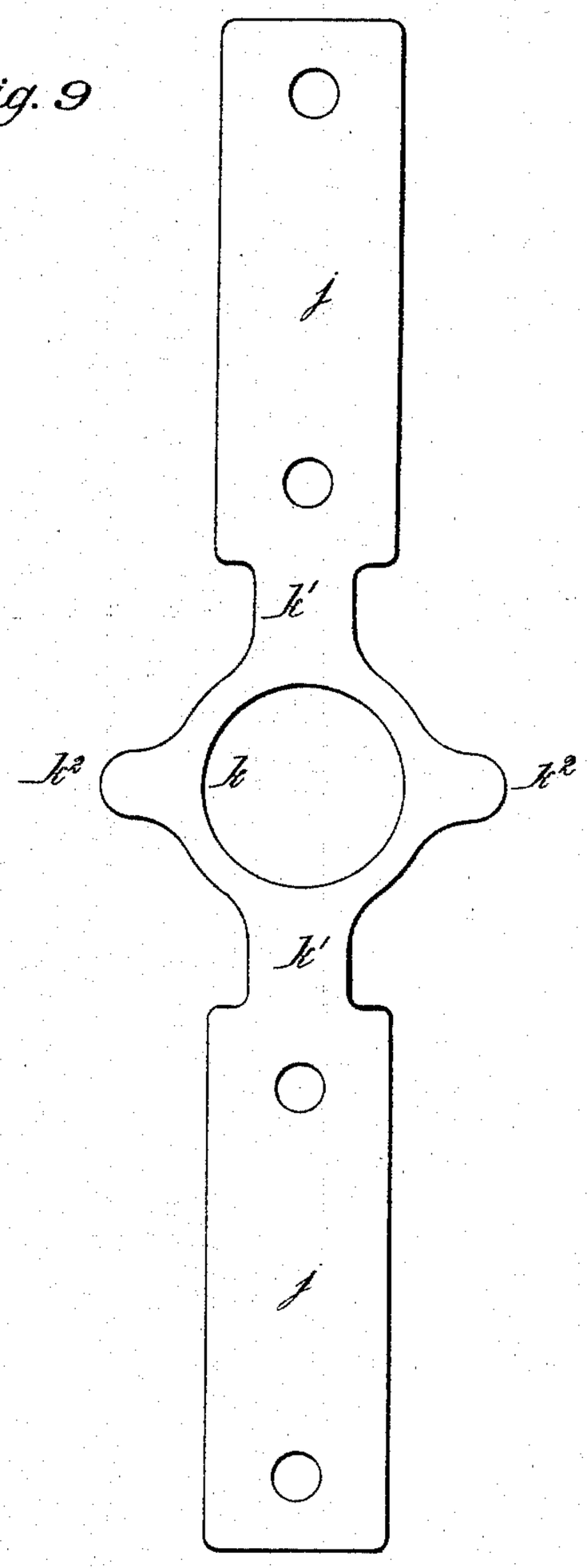
(No Model.) 2 Sheets—Sheet 2.

J. S. COPELAND.

PEDAL.

No. 527,520. Patented Oct. 16, 1894.

Fig. 9



Witnesses:
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UNITED STATES PATENT OFFICE.

JAMES S. COPELAND, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE POPE MANUFACTURING COMPANY, OF SAME PLACE, AND PORTLAND, MAINE.

PEDAL.

SPECIFICATION forming part of Letters Patent No. 527,520, dated October 16, 1894.

Application filed March 8, 1894. Serial No. 502,934. (No model.)

To all whom it may concern:

Be it known that I, JAMES S. COPELAND, a citizen of the United States, and a resident of Hartford, county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Pedals, of which the following is a specification, reference being had to the accompanying drawings, forming part hereof.

This invention relates to pedals and more particularly to the class of pedals used on the cranks of bicycles and like foot driven vehicles.

One of the objects of this invention is to provide a pedal which, while it affords a secure foot hold and is of ample strength, shall be of extremely light weight.

Another object is to provide for readily removing the foot holds so that they may be reversed to equalize the wear or may be replaced by new foot holds, and for readily taking apart the pedal for repair or renewal of any part.

The accompanying drawings illustrate embodiments of this invention.

Figure 1 is a side elevation of a pedal, and Fig. 2 an end elevation of the same. Fig. 3 is a section of the same on the line 3—3, Fig. 2; and Fig. 4 is a section of the same on the line 4—4, Fig. 1. Fig. 5 is a plan view showing the plates which carry the foot holds detached from other parts but placed in their usual relative positions, and Fig. 6 is an end elevation of the same. Fig. 7 is a side elevation of one of the foot holds, detached, and Fig. 8 a section of the same on the line 8—8, Fig. 7. Fig. 9 is a face view of one of the plates after the same has been cut or stamped to proper configuration or shape but before being bent from the flat.

The pedal pin *a* may be of any suitable construction and in the embodiment of my invention shown in the drawings (see Fig. 3), is provided with a collar *b* having a concave cone *b'* forming one bearing surface for the balls *c*. The outer end of the pedal pin is threaded and has screwed thereon the concave cone *d* forming one bearing surface for the balls *c'* and this cone *d* is held in desired position by the lock nut *e*.

The construction of the pedal pin and bearings may be altered from that shown, and any suitable construction may be employed.

The pedal barrel *f* in the embodiment of my invention herein shown is tubular and at its ends, where it incloses the ball bearings, is provided with enlargements *f'* and f^2 within which are formed the runways for the sets of balls *c* and *c'*. The outer surfaces of these enlargements are provided with shoulders f^3 and f^4, and with suitable surfaces to receive the foot hold carrying and clamping plates as hereinafter described. The enlargements *f'* and f^2 constitute the bearing inclosing device, and may be otherwise joined than by the tubular barrel *f*, but the construction employing the tubular barrel is preferred as it properly holds the bearings in alignment and protects the bearings from dust. So also the bearing inclosing device may consist of one or more simple bearing pieces or tubes or barrels without ball bearings.

The outer ends of the barrel *f* are shown provided with dust caps *g* which may be of any suitable construction. These dust caps may be omitted in some constructions.

The foot holds *h* are made of rubber or other suitable material and constitute the direct support for the foot of the user. They are enlarged at their upper and lower ends and are quite thin medially so as to be of very much lighter weight than the pedal rubbers usually employed. In the embodiment of my invention herein shown these foot holds are reinforced by strips *h'* of canvas or other suitable material covering their medial surfaces, as shown in Fig. 8. These reinforce pieces *h'* are cemented or vulcanized upon and thus firmly attached to the foot holds and are highly effective in retaining the foot holds in their proper shape and in preventing them from being pulled out from between the clamping plates, and these reinforced surfaces come in contact with the clamping plates between which the foot holds are held by fastening devices preferably comprising bolts *i*, *i* having nuts *i'* on their inner ends. Metal washers i^2 are preferably interposed between the material of the foot holds *h* and the bolts *i*, and these washers limit the amount of compression in clamping the foot holds *h*, and

protect and separate the bolts from the material of the foot holds.

The clamping plates between which the foot holds are held are shown as of the configuration particularly illustrated in Fig. 9, that is to say, comprising the two portions j, j, which are the clamping plates proper, and the middle portion k, which is perforated so as to fit over one of the enlargements or bearing inclosing devices f', f^2, and the arms k', k', joining the portions j and k. The middle portion k is also provided with guards k^2, k^2, to prevent the foot of the user of the pedal from slipping off sidewise. These plates are preferably stamped to the desired shape and then curved or bent so that the clamping parts j are at right angles to the middle part k, and the clamping parts j and guards k^2 are shaped to the form shown in Figs. 1 to 6 inclusive. Two of these plates are arranged in the pedal in the positions shown in Figs. 5 and 6, one plate having slightly shorter arms k' than the other, so that the clamping parts j overlap each other and are spaced at desired distances apart to hold between them the foot holds h. This is accomplished by placing the middle parts k of the plates over the enlargements f' and f^2 respectively, and moving them inward until they bear against the shoulders f^3 and f^4 respectively and the foot holds h are at the same time introduced between the plates. The bolts and nuts i, i', or other fastening devices are then inserted and tightened and firmly clamp and hold the plates and foot holds together, and when the parts are thus held together the shoulders f^3, f^4, effectually prevent longitudinal movement.

The rotative stress between the plates and the bearing inclosing devices, is of slight magnitude and little importance, and the plates, therefore need only be somewhat tightly fitted over the enlargements f', f^2, and it is indeed of material advantage to have no rigid rotative connection between the plates and the bearing inclosing devices as the bearing inclosing devices are thereby to a great extent relieved from the usual bad effects of distortion or twisting of the end pieces.

It will be evident that the pedal may be readily taken apart for repair, reversal or renewal of the foot holds since upon the withdrawal of the bolts i, the plates may be readily pulled off the pedal barrel and separated from each other and from the other parts of the pedal.

It is evident that the construction herein described and shown, may be modified in many respects, in various applications and in adapting my invention to special and different constructions of pedal pins and bearing inclosing devices, and I therefore do not limit my invention to the specific constructions herein shown; but

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

1. In a pedal the combination with a pedal pin and a bearing inclosing device fitted to rotate thereon, of plates mounted upon said bearing inclosing device and extending outward therefrom and curved or bent and overlapping each other, and foot holds held between said overlapping portions of the plates, substantially as set forth.

2. In a pedal the combination with a barrel having enlargements within which are formed runways for ball bearings, of plates mounted upon said enlargements and extending outward therefrom and curved or bent and overlapping each other, and foot holds held between said overlapping portions of the plates, substantially as set forth.

3. In a pedal the combination of a pedal barrel having shouldered enlargements within which are formed runways for ball bearings, with plates mounted upon said enlargements and bearing against said shoulders and portions of said plates overlapping each other, and foot holds held between said overlapping portions of the plates, and fastening devices passing through said plates and foot holds and holding the same together, substantially as set forth.

4. In a pedal the combination of a pedal pin and a bearing inclosing device having shouldered portions, with plates mounted upon said shouldered portions and bearing against said shoulders, and portions of said plates overlapping each other, and foot holds held between said overlapping portions of the plates, and fastening devices holding said plates and foot holds together, substantially as set forth.

5. In a pedal, foot hold carrying plates extending outward from the axis of the pedal and curved or bent and overlapping each other, and foot holds held between said overlapping portions of the plates, substantially as set forth.

This specification signed and witnessed this 22d day of February, A. D. 1894.

JAMES S. COPELAND.

In presence of—

ALVIN W. COMSTOCK,

W. S. HAMILTON, Jr.