

(No Model.)

C. E. DURYEA.
PEDAL FOR BICYCLES.

No. 432,126.

Patented July 15, 1890.

Fig. 1.

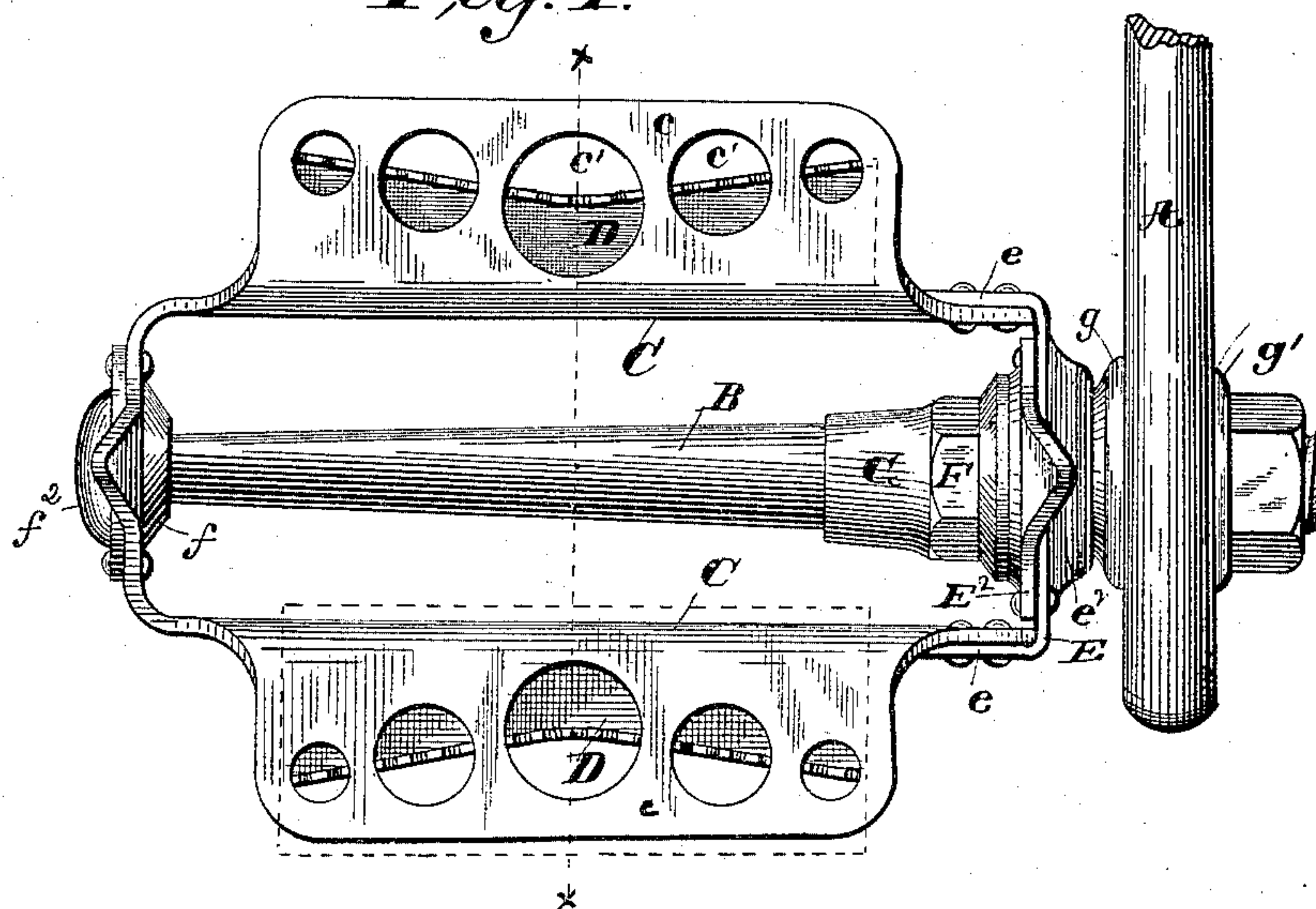


Fig. 3.

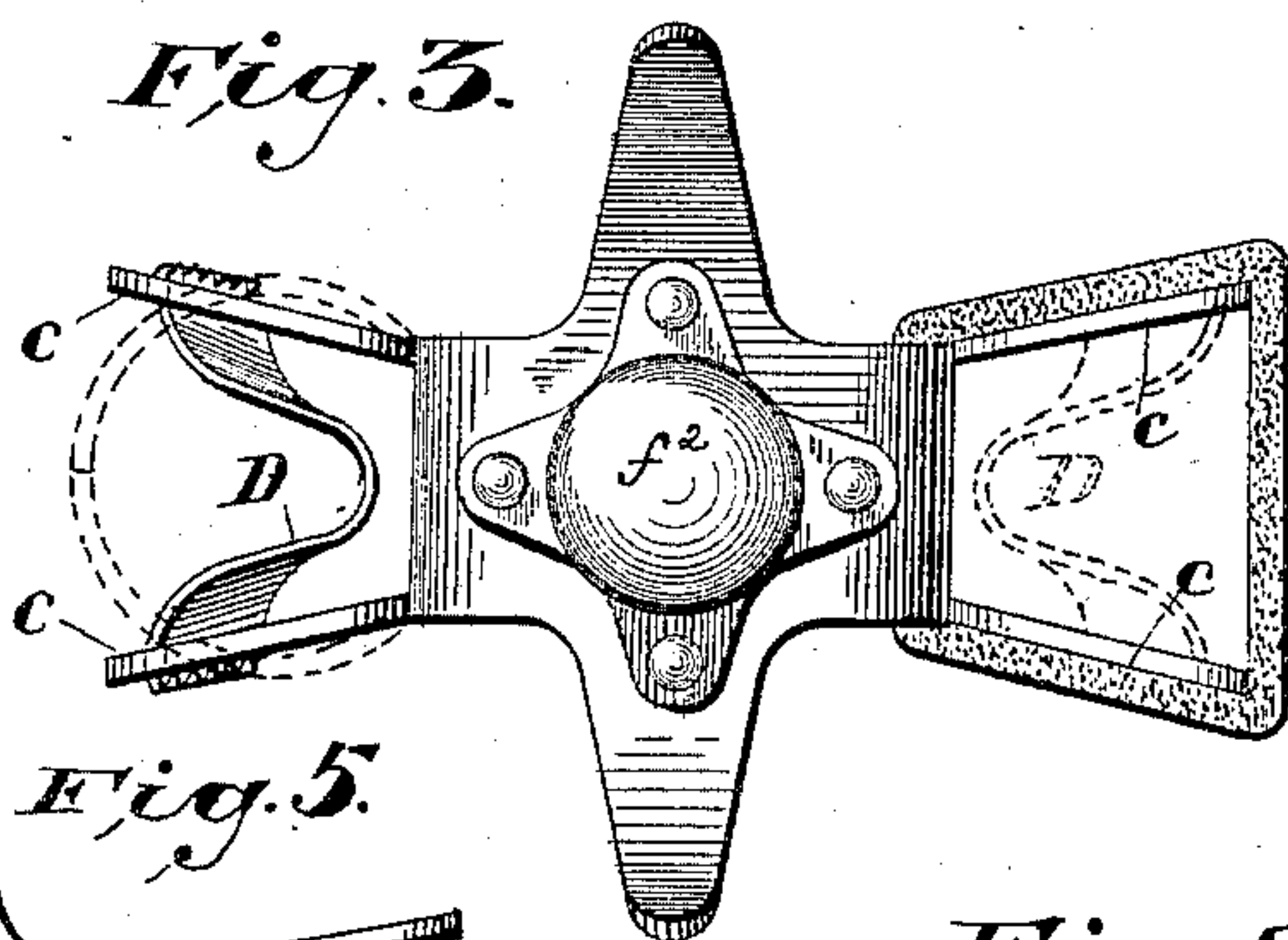


Fig. 4

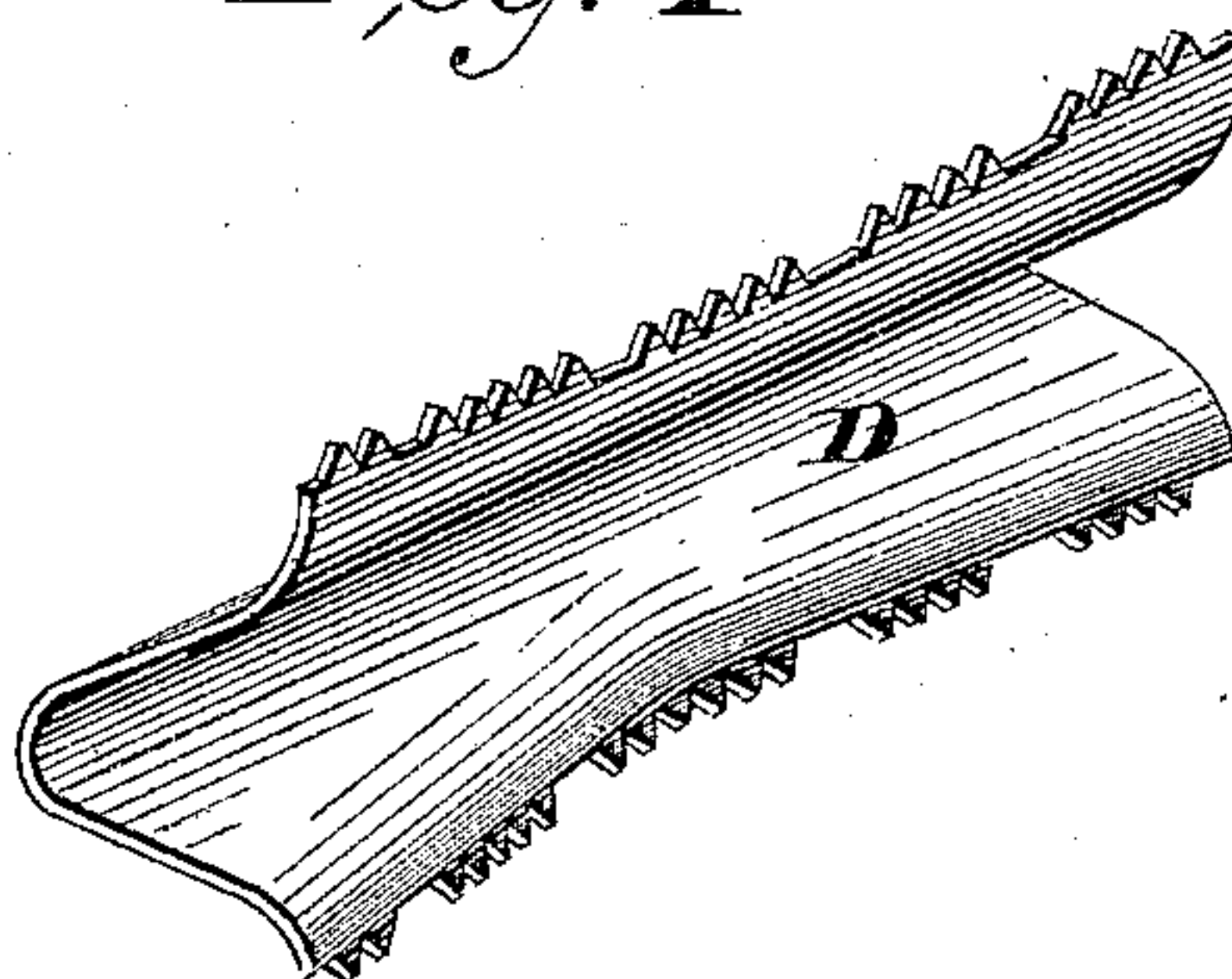


Fig. 5.

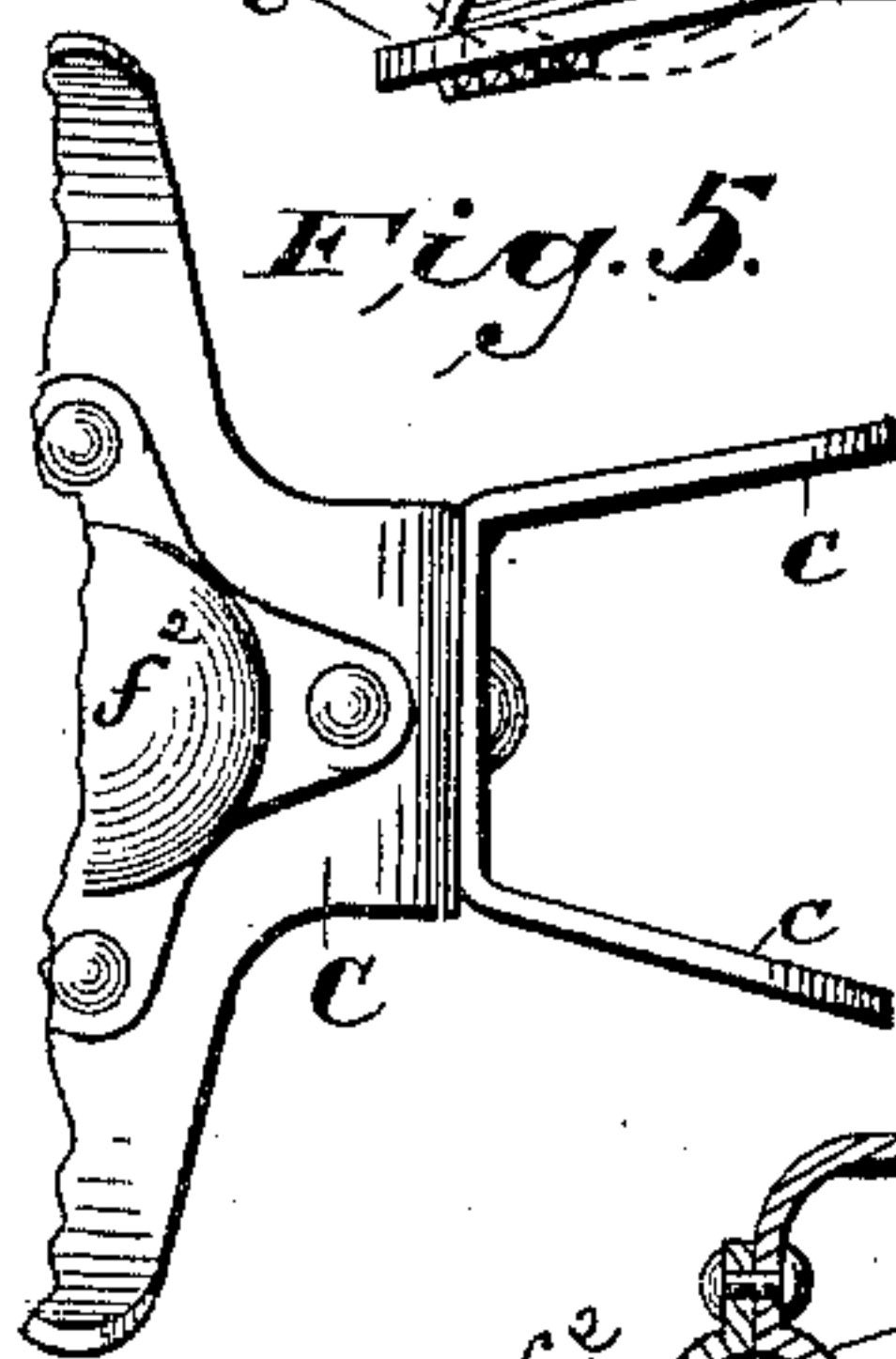
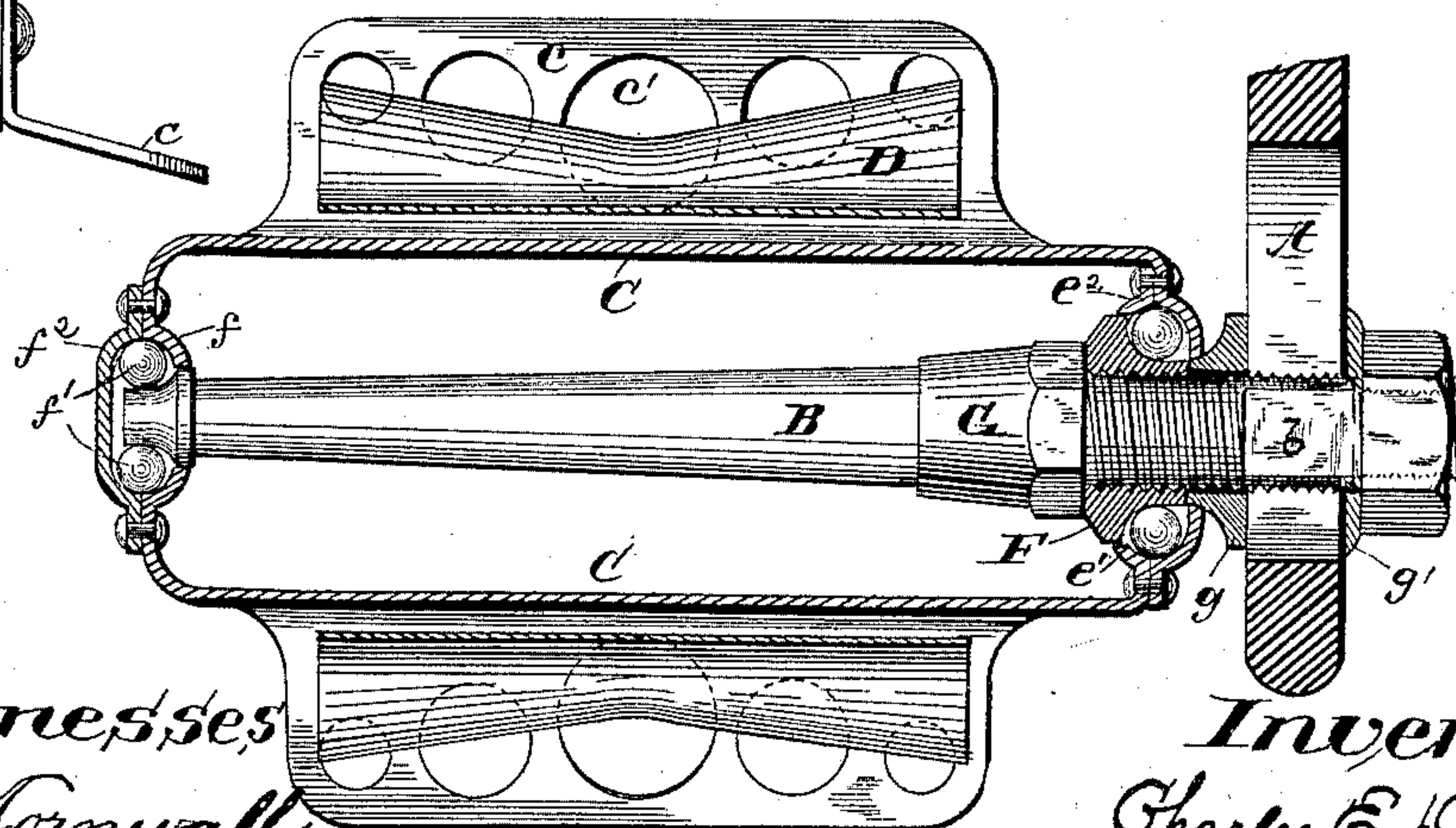


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

CHARLES E. DURYEA, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR,
BY DIRECT AND MESNE ASSIGNMENTS, TO THE ROUSE-DURYEA CYCLE
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PEDAL FOR BICYCLES.

SPECIFICATION forming part of Letters Patent No. 432,126, dated July 15, 1890.

Application filed December 12, 1889. Serial No. 333,396. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. DURYEA, a citizen of the United States, residing at Washington, in the District of Columbia, have
5 invented certain new and useful Improvements in Pedals for Bicycles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as
10 it appertains to make and use the same.

My invention relates to certain new and useful improvements in pedals for operating the cranks of bicycles and other vehicles. One of its objects is to furnish a rat-trap at-
15 tachment to be applied to the foot-piece to prevent the foot from slipping while actuating the pedal at a high speed, and at the same time furnish the requisite elasticity to the foot-piece.

20 A further object is to furnish a pedal which which can be used either as a plain pedal or as a rat-trap pedal at the will of the rider, the construction of the rat-trap attachment being such that it can be readily and easily applied
25 to and removed from the foot-piece.

A further object of the invention is to reduce the number of parts to a minimum, thereby avoiding the liability of the parts to become loose and rattle.

30 To these ends my invention consists of certain details of construction and combinations of parts to be more fully set forth, and pointed out in the ensuing specification and claims.

In the accompanying drawings, Figure 1
35 represents a plan view of my improved pedal applied to the crank-arm of a bicycle. Fig. 2 is an end elevation of the same. Fig. 3 is a section of the same on the line $x x$ of Fig. 1. Fig. 4 is a perspective of the rat-trap attachment detached. Fig. 5 is a modified form of
40 my improvement.

The same letters of reference indicate identical parts in all the figures.

45 In the drawings, A indicates the crank-arm of the bicycle; B, the crank-pin; C, the foot-piece or frame of the pedal, and D the rat-trap attachment. The frame C is provided with two bearing-surfaces, as usual, one each

side of the crank-pin B, and is formed of a single piece of sheet metal bent into U form, 50 each arm of the U being provided on its opposite edge with outturned flanges $c c$, which form obtuse angles to the frame C, as shown in Fig. 2, to serve as the bearing or contact surface for the foot. The extremities of the
55 arms C C are riveted or otherwise secured to arms $e e$ of a L-shaped end plate E. At the middle point of the frame C of the foot-support is provided an inwardly-projecting depression f , having a central opening adapted
60 to receive the outer or small end of the crank-pin B, the concavity of said depression f forming one half of a ball-race f' , the other half being formed by a similarly-shaped closed cap f^2 , riveted or otherwise secured thereto. A simi-
65 lar ball-bearing is formed for the other or large end of the crank-pin by the depressions $e' e^2$, respectively, in the end plate E and cap E^2 . The latter ball-bearing is adjustable by means of an internally-screw-threaded collar F on the
70 screw-threaded end of the crank-pin, the periphery of said collar being turned down to form the inner track for the balls to run on. A jam-nut or screw-threaded collar G is fitted on the crank-pin in order to retain the conical
75 adjusting-collar F in place after it has been adjusted to its proper place.

Two washers $g g'$ are placed on the end of the crank-pin B, between which the crank-arm A is clamped in the usual manner by the
80 usual clamping-nut, the inner side of the washer g being adapted to bear against the contracted end of the conical collar F. When it is desired to adjust the said bearings, it is only necessary to loosen the clamping-nut and
85 jam-nut G, adjust the conical collar F, and again screw the clamping and jam nuts home. The pin B is flattened at b , where it passes through the slot in the crank-arm A, to prevent the pin from turning when the
90 conical collar is adjusted.

The flanges which form the contact-surfaces or foot-support of the foot-piece are perforated by the openings $c' c'$, and between these
95 flanges I secure the rat-trap attachment D, the teeth thereof projecting through the per-

forations. This rat-trap consists of a single piece of springsheet metal, of less length than the flanges *c* and of greater width than the distance between the said flanges, bent longitudinally into **U** form, with its edges slightly turned outward, and provided at intervals on its edges with teeth, so that when the rat-trap is placed in position between the flanges the teeth will project through the perforations, while the plain edges will bear against the metal between said perforations. In the drawings I have shown the toothed edges of the rat-trap slightly curving, so as to pass through the center of the perforations, and thereby give a greater bearing on the sole of the shoe; but this not necessary, as said edges may be in a straight line, if preferred. It will be observed that by constructing the rat-trap in the form of a **U**-shaped spring and allowing the teeth to project only a short distance beyond the plane of the foot-support the spring will yield under a certain pressure, and thereby prevent the teeth from entering the sole of the shoe and tearing the same, as is often the case in the ordinary rat-trap pedal, and at the same time it will prevent the shoe from slipping when riding at a high speed. While I have shown and described the rat-trap *D* as composed of a single spring, it is evident that two or more short springs may be used without departing from the principle of my invention.

If found more desirable, the rat-trap may be omitted and the foot-support used as plain contact-surfaces. The flanges *c c*, being inclined inwardly toward the center of the crank-pin, conform to the curvature of the sole of the shoe, so that the shoe will not easily slip therefrom, or the foot-supports may be covered with a thin sheet or tubing of rubber or other frictional material, as shown in full lines on the right-hand side of Fig. 2 and in dotted lines in Fig. 1. In some cases I may bend the flanges *c c* in the form of a tube, as shown in dotted lines on the left-hand side of Fig. 3, and the same may be covered with rubber, if desired.

In Fig. 2 I have shown a modification of my invention, in which the body portion of the foot-piece is formed of a single piece. The extremities of the arms of the **U** instead of terminating close to the flanges *c c* are extended somewhat beyond said flanges, and are turned inward at right angles to the frame, so as to overlap each other, the overlapping ends being connected together by means of rivets or otherwise and provided with the ball-races similar to the plates *E E'*.

The advantages of my invention will be readily appreciated by bicyclists, as it is almost instantly convertible from a rat-trap pedal to a plain pedal, and vice versa, and when used as a rat-trap pedal the teeth are prevented from entering the sole of the shoe far enough to injure the same, by reason of the elasticity of the **U**-shaped construction.

In some cases I may construct the flanges

separate from the body portion *C*, and secure the same thereto by means of rivets or otherwise.

Among the incidental advantages of my invention may be mentioned that it combines lightness with strength, is neat in appearance, the foot-supports never roll, as is the case with ordinary pedals, and is free from oil and dirt, which collect at the outer end of most pedals and are continually soiling the clothes.

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

1. A bicycle-pedal consisting of a piece or pieces of stamped sheet metal bent to form the ends and sides of the frame, with bearings in the ends, and having outturned flanges on the sides forming foot-supports, substantially as and for the purposes described.

2. A bicycle-pedal frame, the ends and sides of which are formed of a single piece of sheet metal having outturned side flanges forming foot rests or supports, substantially as and for the purposes described.

3. In a pedal for bicycles and similar vehicles, the combination, with the pedal-frame having outturned perforated flanges, of a rat-trap attachment interposed between the flanges each side of the crank-pin, substantially as and for the purposes described.

4. In a pedal for bicycles and similar vehicles, the combination, with the pedal-frame provided at its opposite edges with outturned perforated flanges, of a spring rat-trap attachment removably secured between said flanges, substantially as and for the purposes described.

5. In a pedal for bicycles and similar vehicles, the combination, with a pedal-frame having outturned perforated flanges, of a rat-trap attachment removably secured between said flanges, said attachment consisting of a spring-metal plate provided on its edges with teeth adapted to project through the perforations in said flanges, substantially as and for the purposes described.

6. In a bicycle-pedal, the combination, with a rigid shell or foot-support, of a serrated rat-trap attachment adapted to recede into or below the foot-support upon excessive pressure, substantially as and for the purposes described.

7. In a bicycle-pedal, the combination, with the end plates, of outturned side flanges forming foot-supports, and rubber or other friction coverings secured to said flanges, substantially as and for the purposes described.

8. In a pedal for velocipedes, the combination, with the pedal-frame having outturned side flanges forming foot-supports, of a removable rubber or other friction covering encircling said flanges, substantially as and for the purposes described.

9. In a pedal for velocipedes, the combination, with the frame of the pedal, of ball-races formed in the ends thereof, a pedal-pin hav-

ing a ball-race at one end and a screw-thread
at the other, a conical collar screwed on said
pin, a collar adapted to bear against said
conical collar, and a clamping-nut, substan-
5 tially as and for the purposes described.

10. In a pedal for velocipedes, the combi-
nation, with the pedal-frame having openings
in its ends, a ball-race formed around said
openings, an adjustable cone on said pin, a

clamping-nut, and caps for covering said ball- 10
races, substantially as and for the purposes
described.

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

CHARLES E. DURYEA.

Witnesses:

E. T. WALKER,

CHARLES S. DRURY.