

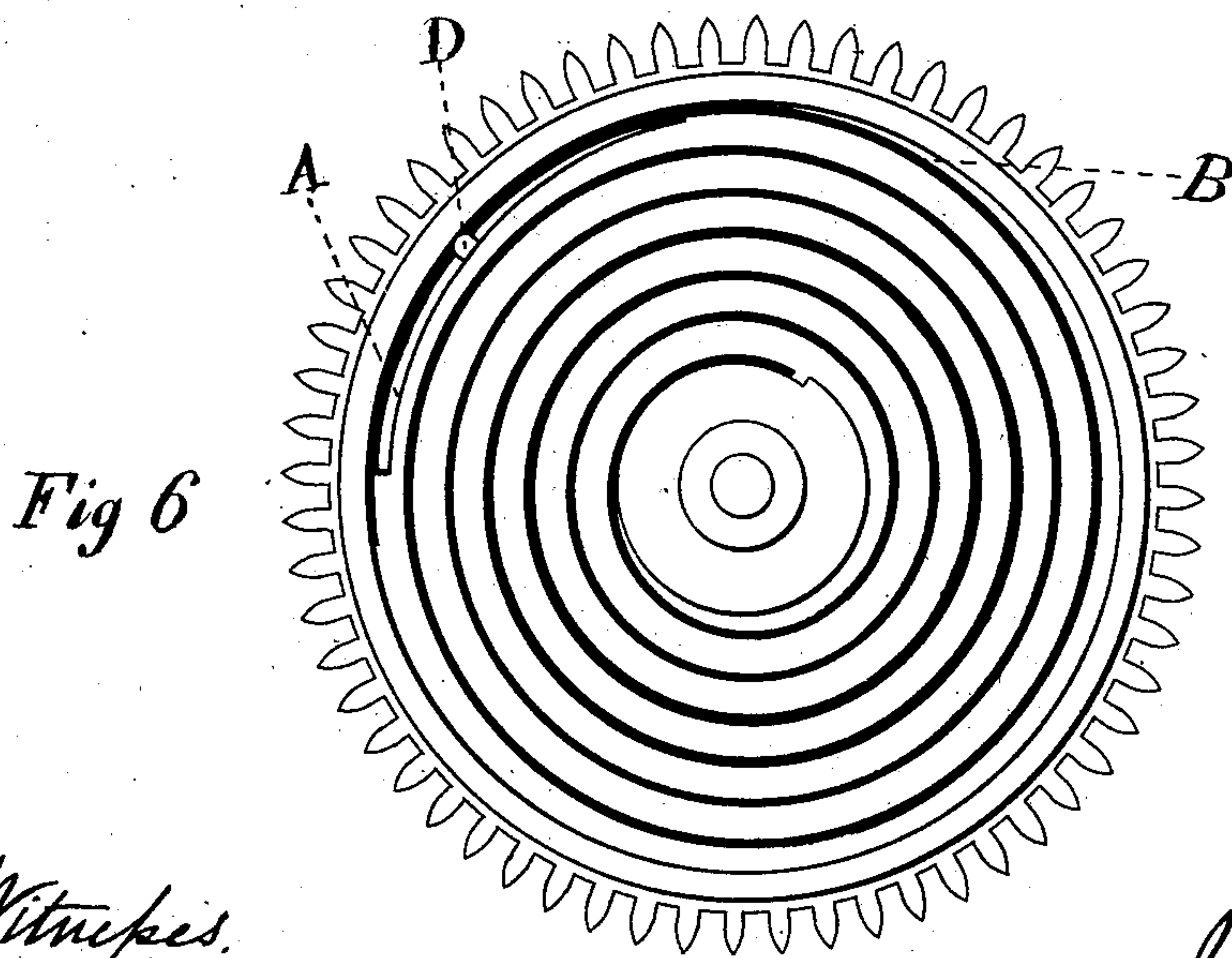
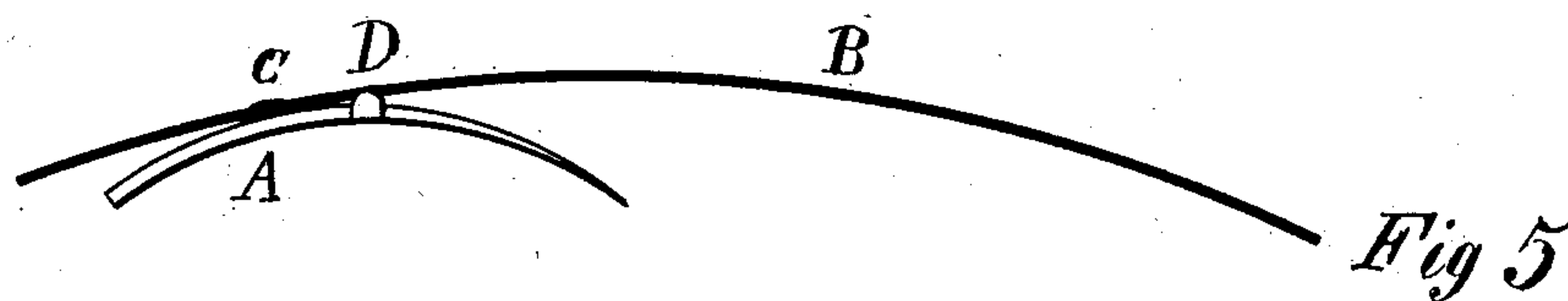
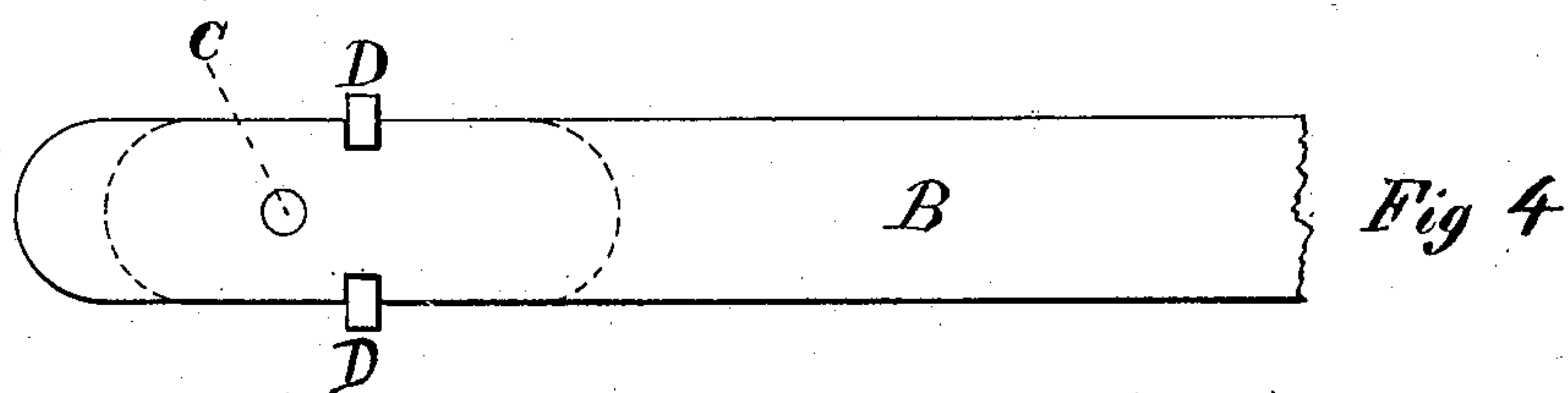
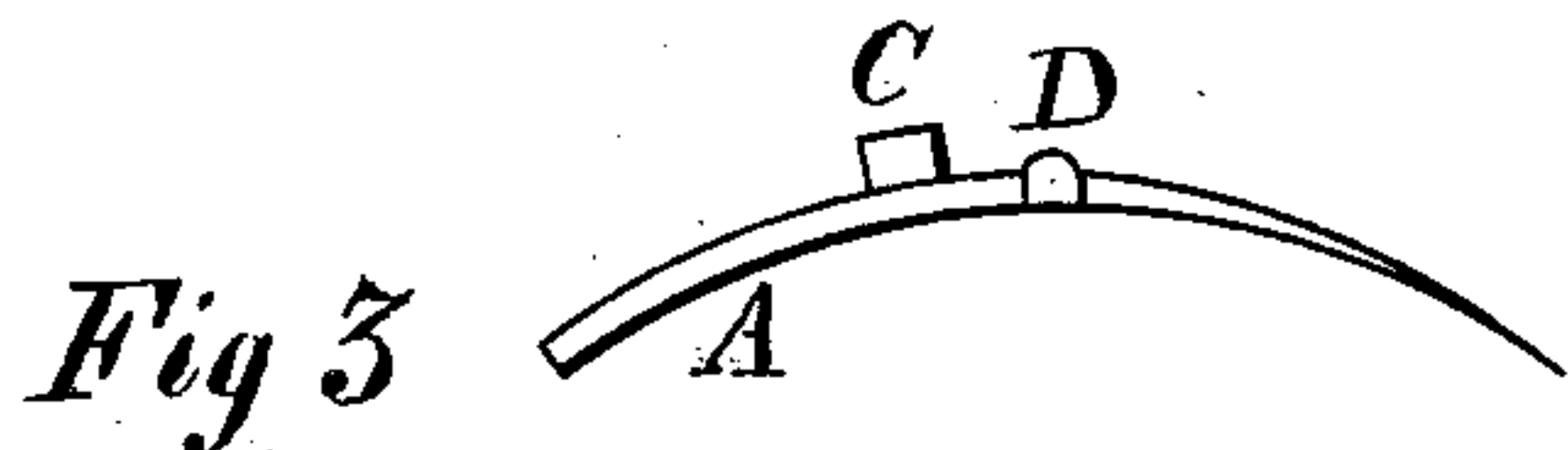
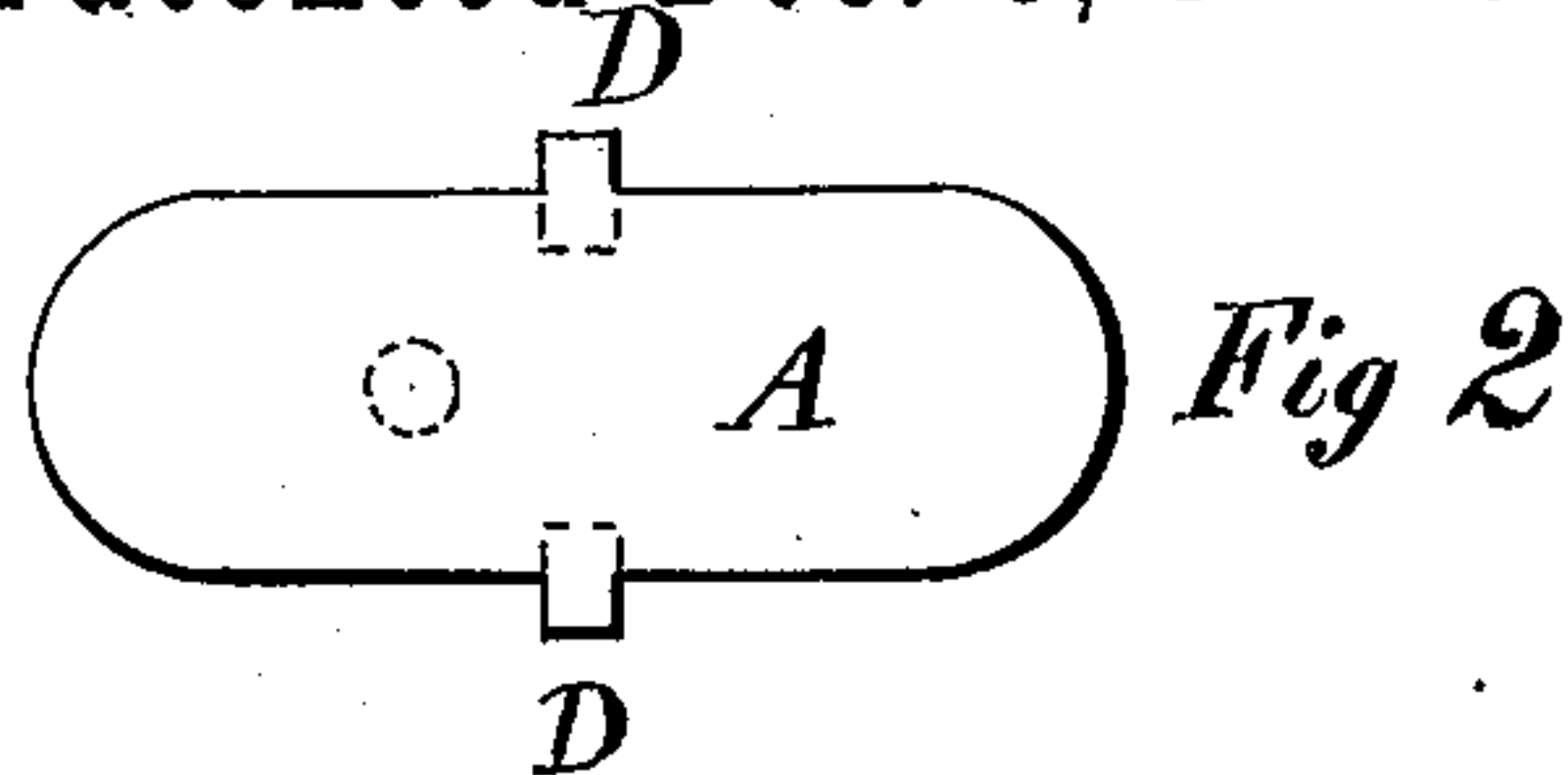
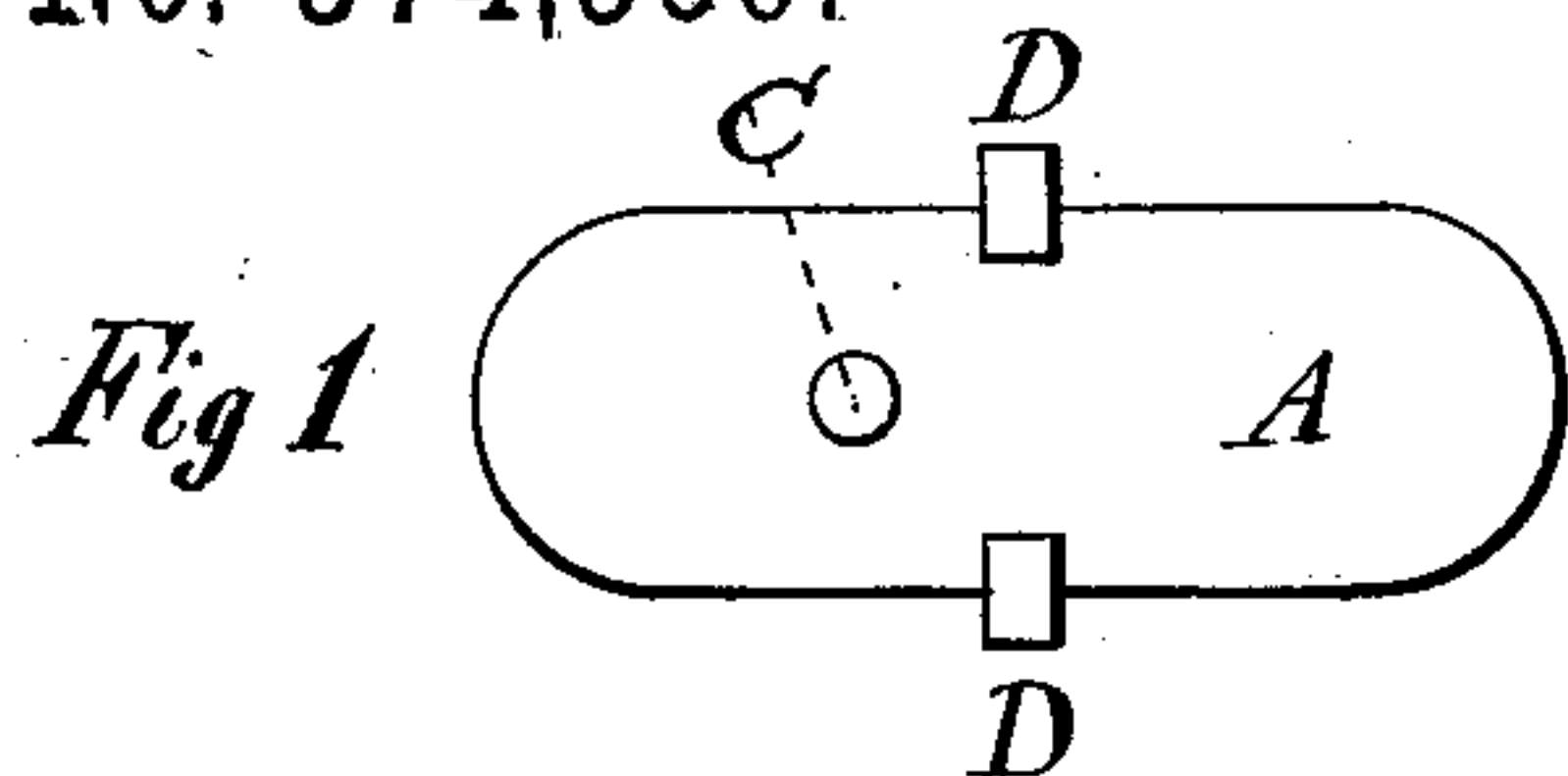
(No Model.)

C. T. HIGGINBOTHAM.

MAINSRING BRACE AND FASTENER FOR WATCHES OR CLOCKS.

No. 374,359.

Patented Dec. 6, 1887.



Witnesses.
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UNITED STATES PATENT OFFICE.

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MAINSRING BRACE AND FASTENER FOR WATCHES AND CLOCKS.

SPECIFICATION forming part of Letters Patent No. 374,359, dated December 6, 1887.

Application filed July 7, 1887. Serial No. 243,620. (No model.)

To all whom it may concern:

Be it known that I, CHARLES T. HIGGINBOTHAM, of Thomaston, Litchfield county, and State of Connecticut, have invented a certain new and useful Improvement in Watches—viz., a new and improved mainspring brace and fastener; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object and nature of my invention are to keep the coils of the mainspring free and apart from each other, and thus prevent loss and variation of the force of the spring by the friction of its coils, and at the same time to firmly secure the outer extremity of the mainspring to and within the mainspring box or barrel by a new device and by simpler and more durable means than any heretofore used or known.

Heretofore the mainsprings of watches have been generally secured to the barrel by a single hook or stud-pin in the perimeter of the mainspring-chamber engaging with a slot in the mainspring, or vice versa. The formation of holes for the studs diminishes the strength of the material at those points to such an extent that it often gives way, as does the hook or stud itself, when subjected to the severe and sudden strain caused by the breaking of the mainspring or by overwinding it. In mainsprings secured in such manner, or in any other manner which I have heretofore seen, there is more or less lateral strain, which serves to cant the coils and to make them impinge upon each other or upon the top or bottom and sides of the barrel, thereby causing friction, which weakens the force of the spring and causes a want of uniformity in its action.

The following is a brief description of the accompanying sheet of drawings.

Figure 1 is a front elevation of the brace. Fig. 2 is a reverse elevation of the brace. Fig. 3 is a view of the longitudinal edge of the brace. Fig. 4 is a front view of a section of the mainspring with the brace riveted thereto on the reverse surface. Fig. 5 is a view of

the longitudinal edge of a section of the mainspring with the brace riveted thereto. Fig. 6 is a top plan view of an uncovered mainspring-barrel and of a partially-wound mainspring in place therein, with my brace and fastener riveted to such spring.

Similar letters of reference indicate like parts in the several figures.

In the figures, A represents the brace; B, a section of the mainspring; D D, semi-cylindrical studs, and C a rivet.

My brace can be manufactured from a piece of steel of suitable length, breadth, and thickness by milling or cutting away the metal, so as to leave it in the required shape; or, more economically and expeditiously, by swaging and stamping such piece of steel into the required shape by means of dies specially made for that purpose.

My brace, as ordinarily constructed by me, for, say, the mainspring of an ordinary eighteen-size watch, consists of a piece of flat steel with semicircular ends about five-eighths of an inch in length, with a body of the same breadth as that of the mainspring to which it is to be attached, and of about eight one-thousandths of an inch in thickness throughout about one-half its length, and thence tapering through the other half to a knife-edge, as shown in Fig. 3. Midway, or thereabout, of its length it has two semi-cylindrical steel lugs or studs, D D, one on each side edge, extending both inward and outward at right angles thereto from two-hundredths to three-hundredths of an inch, and of about double the thickness of the flat steel at that point. These studs are finished flush with the one surface of the brace, as shown in Fig. 2, while on the other surface, Fig. 1, they appear in semi-cylindrical form. From the latter surface, and midway, or thereabout, between these studs and the butt or thicker end of the brace, there is a cylindrical projection or pin, C, of proper size and length for and to be a rivet for the purpose of riveting the brace A to the mainspring B. Before being so riveted the brace is bent into a segment of a circle, as shown in Fig. 3, corresponding in curve with the interior of the barrel in which the mainspring is to be placed.

The brace is next hardened and tempered, and it is then ready to be riveted to the inner

side of the outer coil of the mainspring at such point and in such manner as to allow its outer end to slightly overlap the butt-end of the brace, as shown in Figs. 4 and 5. Recesses or slots are cut at the proper places in the sides of the mainspring, and into which are let the inner ends of the studs, so as to diminish the space the brace and spring would otherwise occupy, while the outer ends project beyond the edges of the mainspring, as shown in Fig. 4, and, passing through holes in the bottom and cover of the mainspring-barrel, securely retain the mainspring in place within the barrel. The studs are greatly strengthened by being extended inward in the form of ribs along the surface of the brace.

I am aware that watch-spring braces called "pivoted braces" have been heretofore constructed in square or rectangular form, with cylindrical or semi-cylindrical flanges or studs running across one end thereof and projecting beyond its edges and the edges of the mainspring, so as to pass through holes in the top and bottom of the mainspring-barrel, and thus to retain the mainspring therein; but such braces have an apron or portion of the brace extending in only one direction from the studs, and must necessarily always be riveted to the mainspring at a point after the studs. Braces so constructed and riveted always have the tendency to deflect the coils of the mainspring to unduly separate them on one side of the arbor and to carry them into contact with each other on the opposite side, and thus by friction the spring is made to "grip" or "kick," as it is called, in the barrel in the process of unwinding. The arc of vibration of the balance is thereby varied, and thus the time of the watch. My brace, on the other hand, has an apron or portion of the brace extending in both directions from the studs, and is riveted to the mainspring at a point before the studs—that is to say, between them and the butt-end of the brace. My brace so constructed and riveted serves to keep the coils of the mainspring uniformly apart from each other while

the spring is unwinding, to constantly preserve the same arc of vibration of the balance, and thus to make the watch keep uniform time. I have also observed that a watch run by means of a mainspring with my brace attached thereto will not only keep more accurate time, but run one to two hours longer than the same watch run by means of the same spring with a "pivoted brace," so called, attached thereto.

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

1. A mainspring brace and fastener with one-half tapering to an edge, and with semi-cylindrical flanges or studs D D on its sides midway, or thereabout, between its ends, designed to be riveted to the mainspring near its outer end and serving to secure it within the barrel, and to keep its coils uniformly apart, or nearly so, in their winding and operation.

2. A mainspring brace and fastener provided with studs or flanges continued inward a short distance in ribs partly across the surface of the brace, in combination with a mainspring having recesses to receive such ribs for the purpose of substantially increasing the strength of the studs without displacing the spring or encroaching upon its space within the barrel.

3. The combination, with the mainspring of a watch, of a brace and fastener tapering to an edge and adapted, when riveted to a mainspring near its outer end, to secure it by means of flanges or studs to and within the mainspring-barrel, and serving also to keep the coils free from each other and to allow them to act without friction or lateral restraint, all substantially as set forth, and for the purposes specified.

Dated New York, June 30, 1887.

CHAS. T. HIGGINBOTHAM.

Witnesses:

Miss T. E. SMITH.

AARON THOMAS, Jr.