

(No Model.)

2 Sheets—Sheet 1.

D. V. B. SMART.  
TROLLEY AND TROLLEY SWITCH.

No. 510,201.

Patented Dec. 5, 1893.

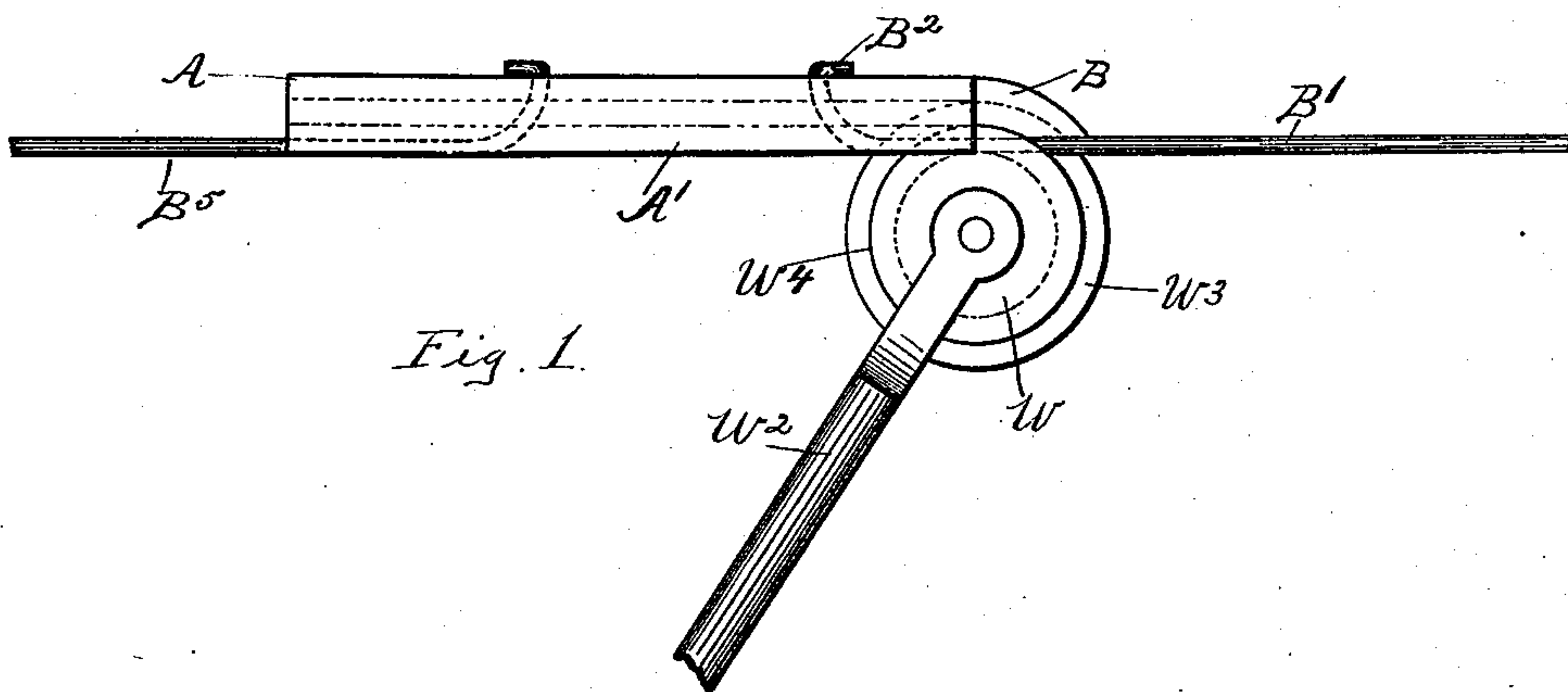


Fig. 1.

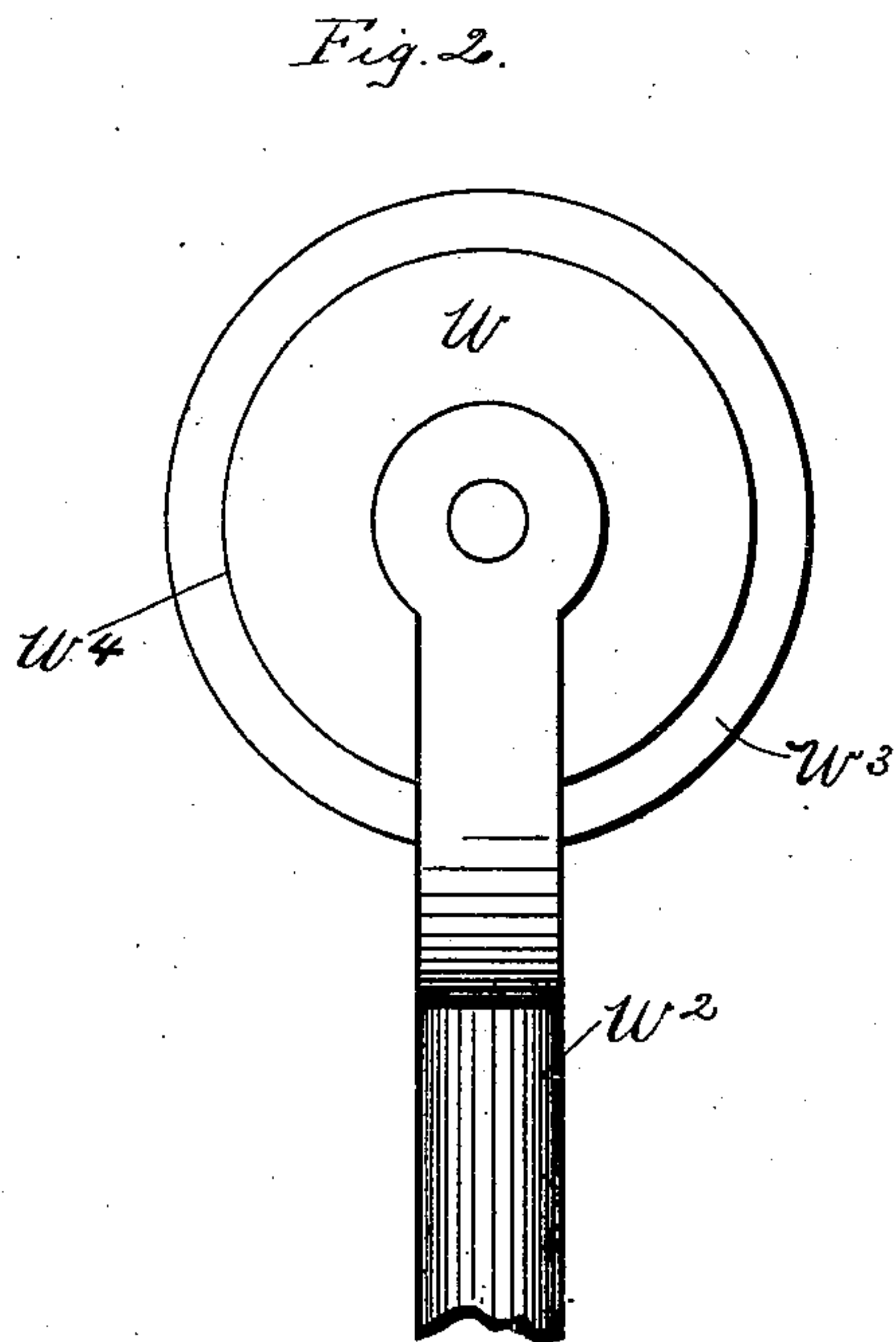


Fig. 2.

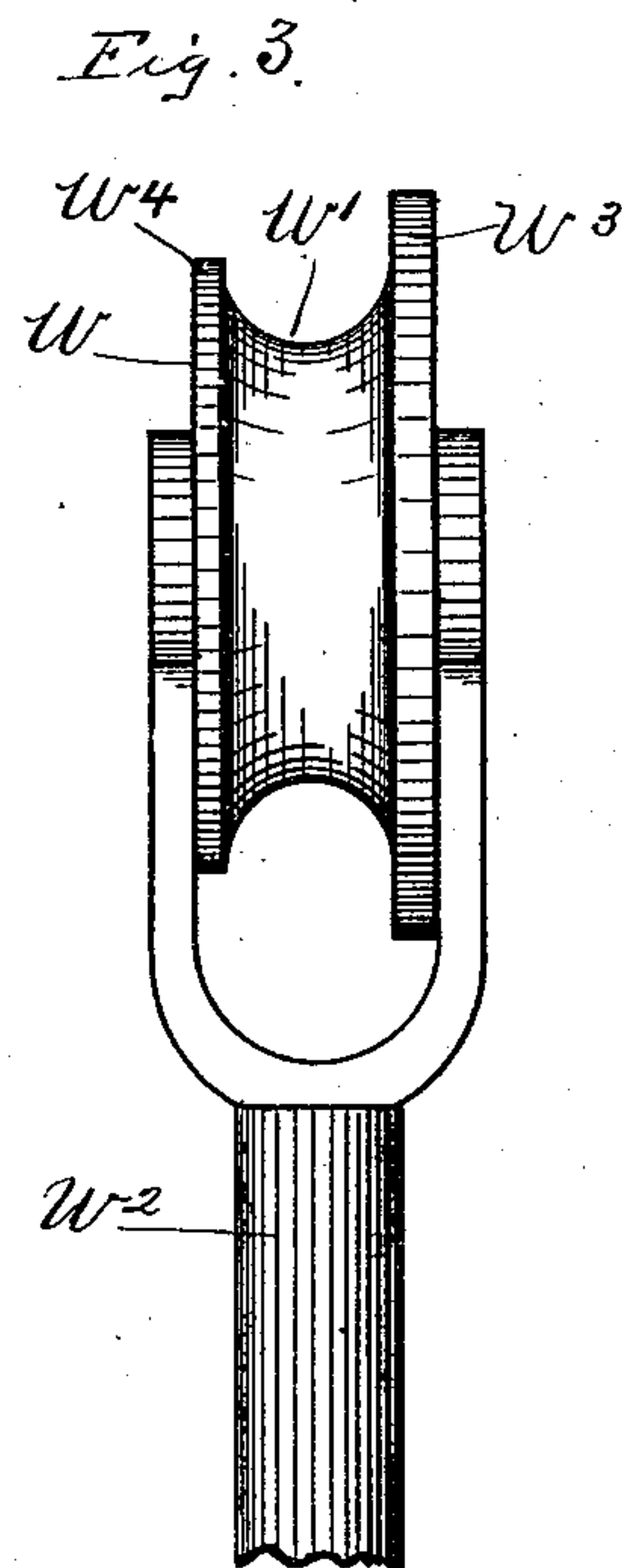


Fig. 3.

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David V. B. Smart  
by Geo. A. Mosher  
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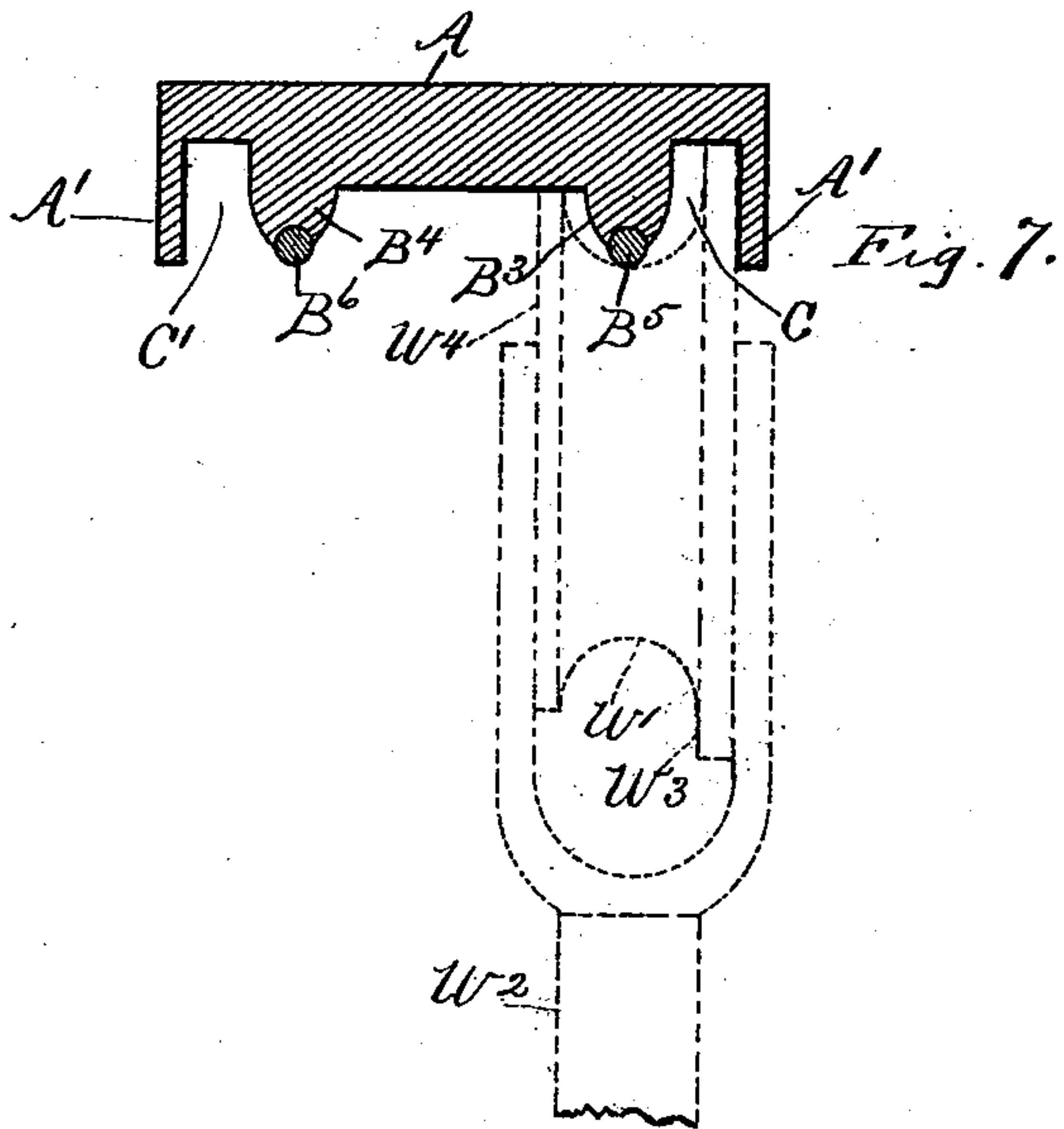
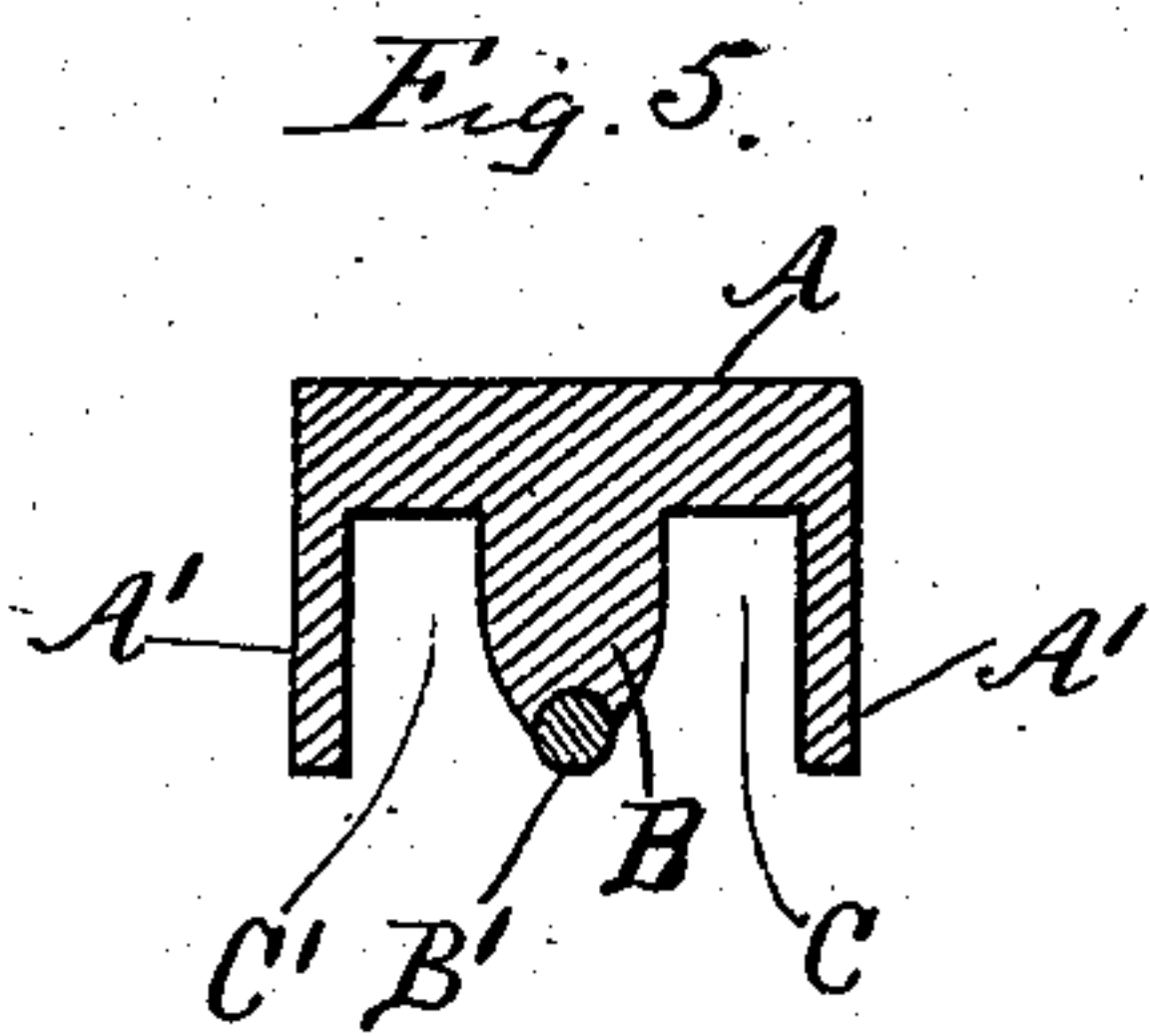
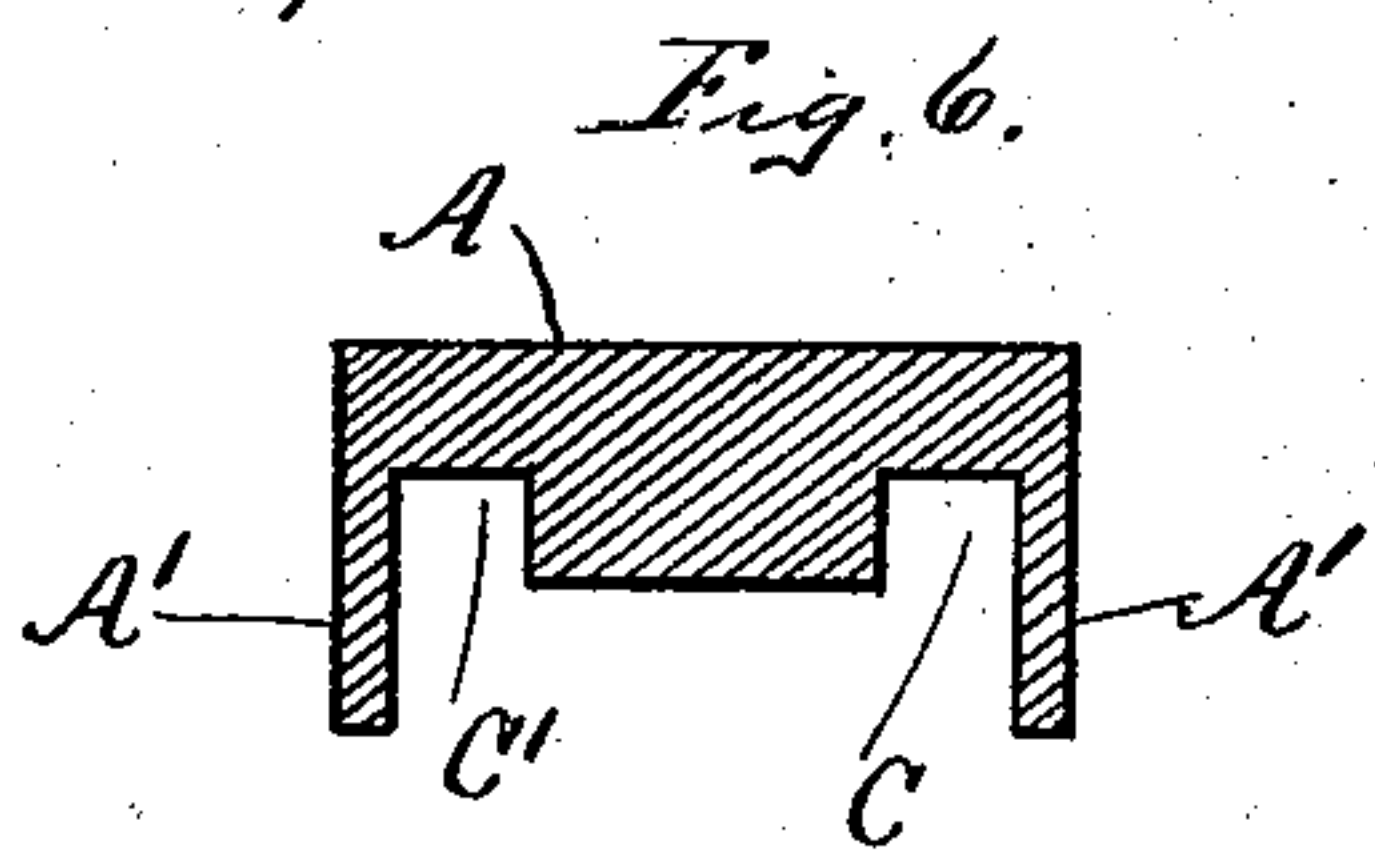
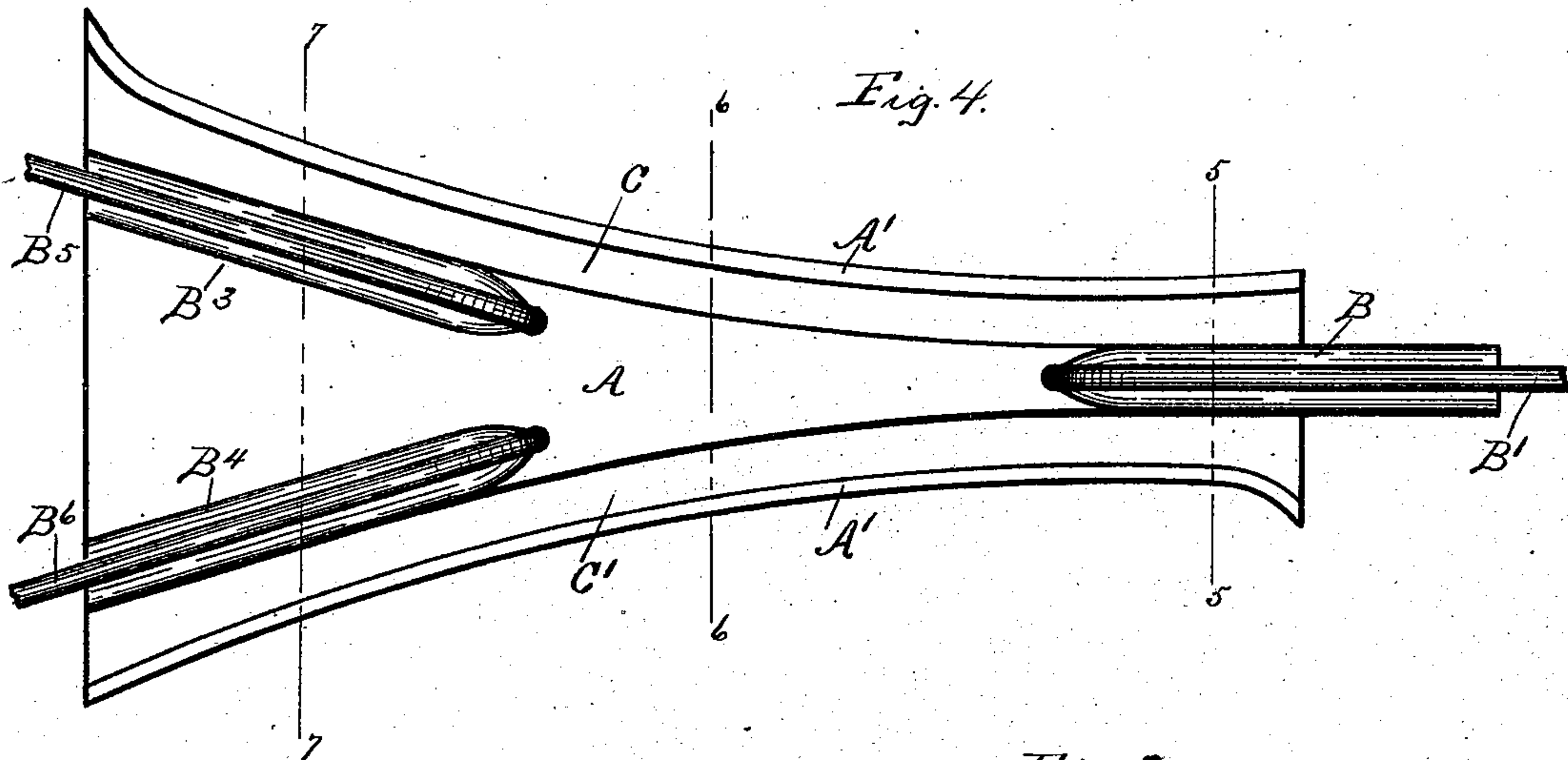
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# UNITED STATES PATENT OFFICE.

DAVID V. B. SMART, OF TROY, NEW YORK.

## TROLLEY AND TROLLEY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 510,201, dated December 5, 1893.

Application filed February 1, 1893. Serial No. 460,506. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID V. B. SMART, a citizen of the United States, residing at Troy, county of Rensselaer, and State of New York, have invented certain new and useful Improvements in Trolleys and Trolley-Switches for Electric Railways, of which the following is a specification.

My invention relates to such improvements and consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying drawings, and the letters of reference marked thereon, which form a part of this specification.

Similar letters refer to similar parts in the several figures therein.

Figure 1 of the drawings is a view in side elevation of my improved switch and trolley, showing the trolley in the position of its initial engagement with the switch-plate, drawn upon a smaller scale than the remaining figures. Fig. 2 and 3 are respectively side and edge views of my improved trolley-wheel and a portion of the trolley-arm. Fig. 4 is a bottom plan view of the switch shown in Fig. 1. Fig. 5 is a vertical cross-section taken on the broken line 5—5, in Fig. 4, showing the bottom side down. Fig. 6 is a similar section taken on the broken line 6—6, in Fig. 4. Fig. 7 is a similar section taken on the line 7—7, in Fig. 4.

A— is the switch-plate provided with the usual depending longitudinal edge-flanges A'— extending the length of the plate, also with a longitudinal depending flange or guide B— extending along the middle portion of one end of the plate adapted to guide the trolley-wheel and support an end of the main line wire or conductor B'— which is passed along the lower surface of the flange B— and up through an aperture in the plate, as indicated by dotted lines in Fig. 1, the projecting end B<sup>2</sup>— being bent down upon the upper surface of the plate, as shown. The other end of the plate is provided with two depending guides B<sup>3</sup>— and B<sup>4</sup>— similar to each other and to the guide B— and converging toward the latter to guide the trolley-wheel and support the wires B<sup>5</sup>— and B<sup>6</sup>— which branch out from the wire-connecting switch-plate. The plate

is also provided with the longitudinal grooves C—, C'—, in its under face to receive one of the groove-flanges of the trolley-wheel W—. This wheel has a circumferential groove W'— adapted to receive the conducting wires, and is pivoted upon the arm W<sup>2</sup>— shown in part only, in the usual manner. The groove-flange W<sup>3</sup>— is diametrically larger than the other groove-flange W<sup>4</sup>—, and is adapted to loosely enter the grooves C—, C'—, in the plate, and be guided thereby as the wheel passes along the under face of the plate from one conducting wire to another. The depth of the grooves in the plate is equal to the difference in length of the radii of the two groove-flanges of the wheel, so that the smaller flange will pass freely from a position in vertical line with one of the grooves in the plate across the under face of the plate while the larger flange follows the bottom of the other groove.

The guides, B—, B<sup>3</sup>—, B<sup>4</sup>—, comprising the end-portions of the wires and their supports, serve to guide the wheel to and from the connecting-plate, while the grooves in the plate and the depending edge-flanges guide it along the plate from one wire to another. The edge-flanges A'— serve to prevent the wheel-flange from escaping from its groove in the plate.

The guides, B—, B<sup>3</sup>—, B<sup>4</sup>—, have the important function of supports in relation to the connecting wires, since they serve to support the wires at such a distance below the under face of the plate that the trolley-wheel will pass from one wire along the under face of the horizontal plate and onto another wire without vertical movement of the wheel.

In switches having the wires secured to the upper face of the plate with downwardly inclined trolley-guides to carry the wheel-flanges into engagement with the under face of the plate, a considerable downward movement was imparted to the trolley in passing from a wire onto the plate, which frequently causes the trolley to jump from the conductor, especially if the trolley-car was moving rapidly.

In my improved construction, the depending wire-supports B—, B<sup>3</sup>—, B<sup>4</sup>—, maintain the wires below the plate in the same horizontal plane with the groove-bottom on the



upper side of the trolley-wheel, when one or both of the groove-flanges engage the plate as the wheel passes from one wire to another. When the depending edge-flanges A'— are  
 5 relied upon to guide the wheel from one wire to another, and the grooves C—, C'—, are dispensed with, the groove-flanges on the wheel can be made of the same diameter, and both  
 10 run upon the under face of the plate in passing from one wire to another, in which case the under side of the plate-supported ends of the wires would project below the under surface of the plate a distance equal to the depth of the groove in the wheel, thereby pre-  
 15 venting any vertical movement of the wheel relatively to the plate in passing the same. I am therefore able to pass switch-plates at a high rate of speed without appreciable sparking or danger of jumping the trolley from the  
 20 conductor. The ends of the wires may be secured to the plate or end-supports on the plate, in any known manner, provided only that they are located the proper distance below the level of the under face of the plate,  
 25 as before explained.

I am aware that trolley-wheels having diametrically unequal groove-flanges have been used with grooved switch-plates, but in such construction the conducting wires were se-  
 30 cured upon the upper surface of the plate and a rapid movement of the car would force the wheel so suddenly downward when passing under the switch-plate as to cause the larger flange to jump out of its groove and leave the  
 35 switch. With my improved means for securing the proper vertical adjustment of wires and switch-plate, it is impossible for the larger wheel-flange to jump from its groove in the plate.

What I claim as new, and desire to secure 40 by Letters Patent, is—

1. In an electric-railway system, the combination with a trolley-wheel having one of its groove-flanges diametrically larger than the other, and conducting main and branch wires, 45 of a wire-connecting switch-plate having on its under side trolley-grooves adapted to receive the larger wheel-flange, and depending wire-supports, one at the end of each groove on the inner side of the groove, which main- 50 tain the wires in a horizontal plane lower than the bottom horizontal surface of the groove-walls, substantially as described.

2. In an electric railway system, the combination with a trolley-wheel and conducting 55 main and branch wires, of a wire-connecting switch-plate having longitudinal trolley-wheel guides and having at its ends depending wire-supports which maintain the wires below the plate in the same horizontal plane with the 60 groove-bottom on the upper side of the wheel, when one or both of the groove-flanges engage the plate as the wheel passes from one wire to another, substantially as described.

3. A switch-plate for trolley-switches hav- 65 ing on its under side longitudinal edge-grooves and a depending trolley-guide at each end of each groove on the inner side of the groove, and means for securing the conduc- 70 tors upon the under surface of the guide and in vertical plane therewith, substantially as described.

In testimony whereof I have hereunto set my hand this 28th day of January, 1893.

DAVID V. B. SMART.

Witnesses:

GEO. A. MOSHER,  
 FRANK C. CURTIS.