

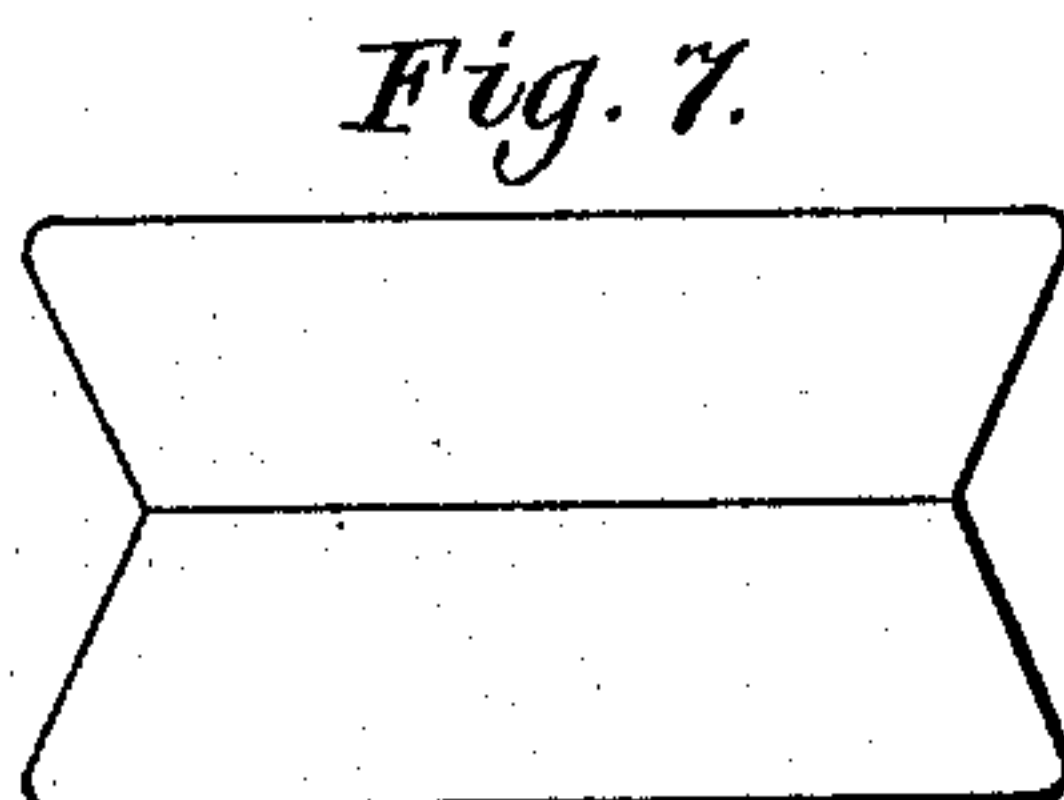
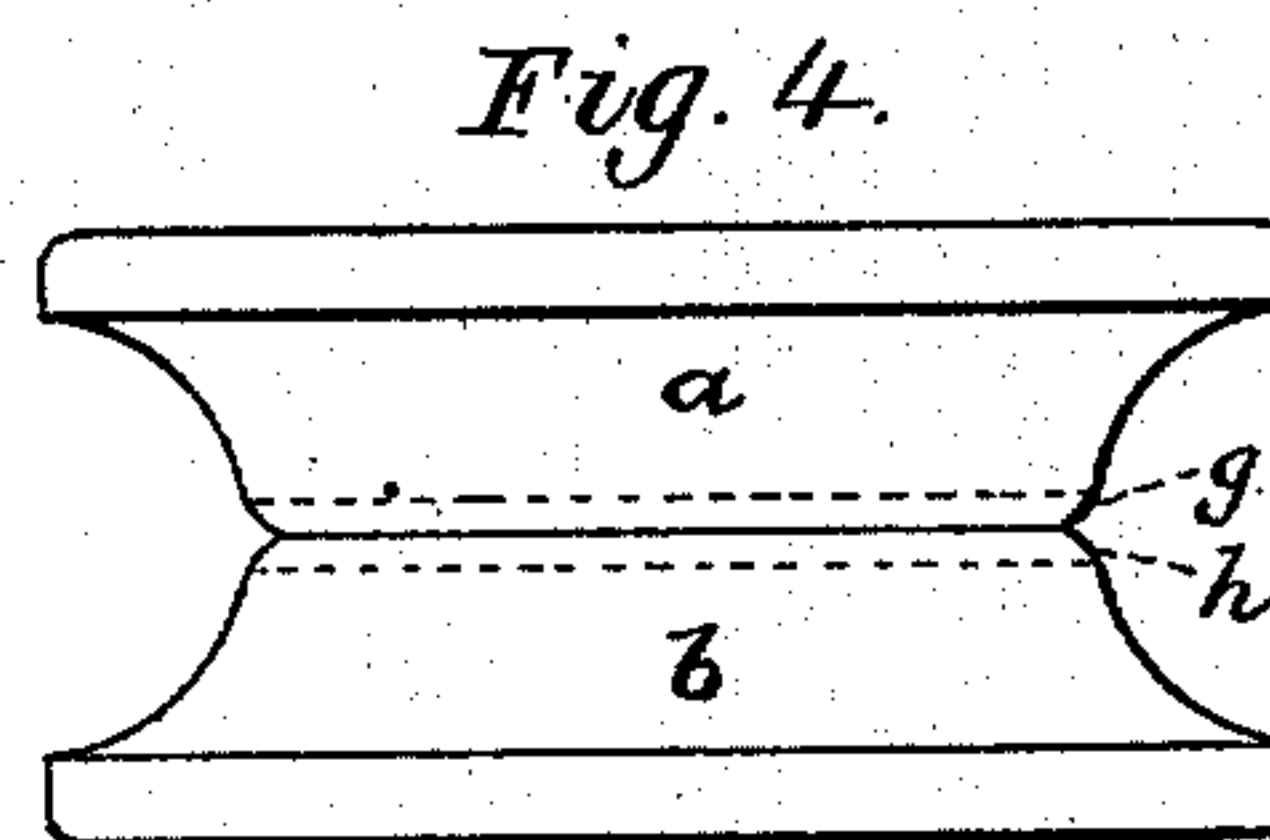
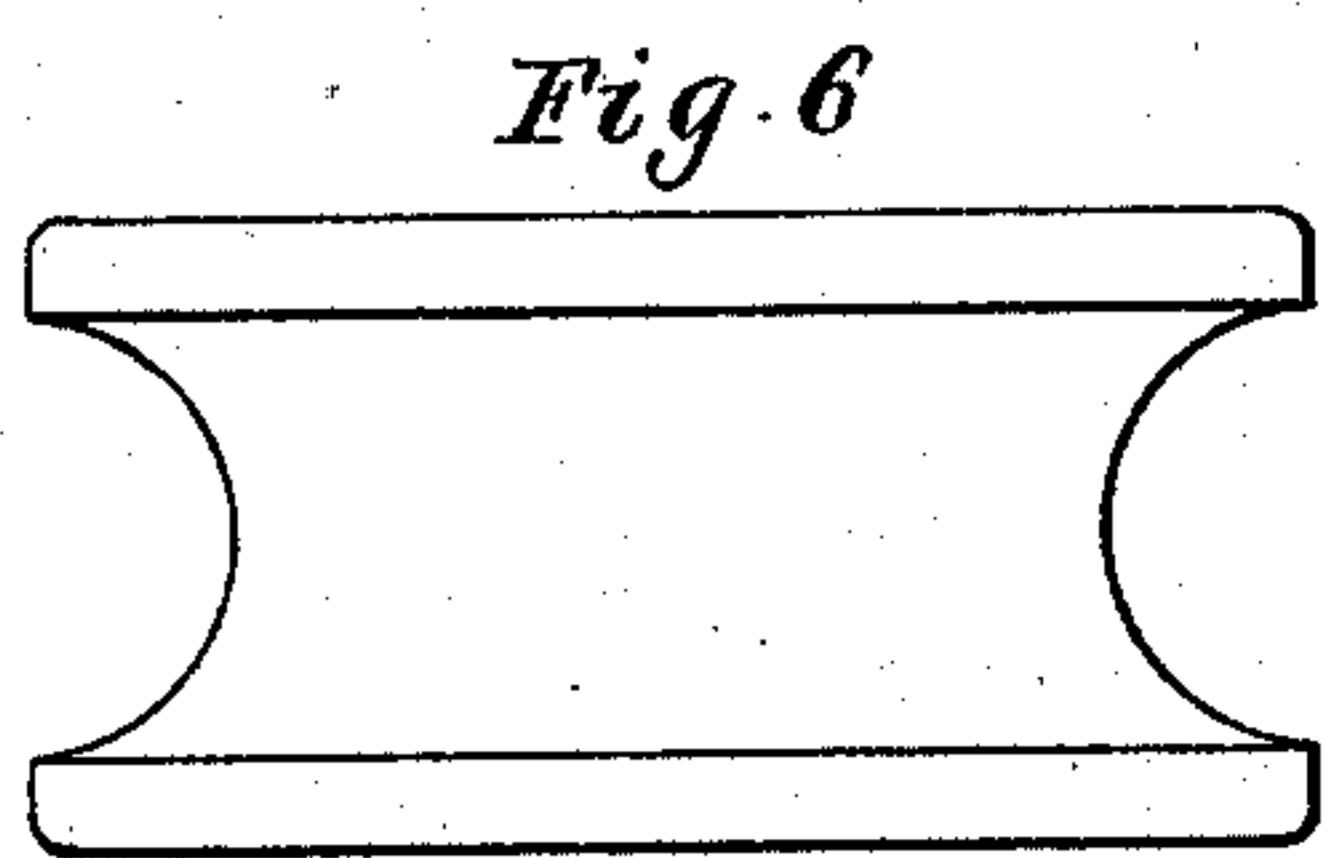
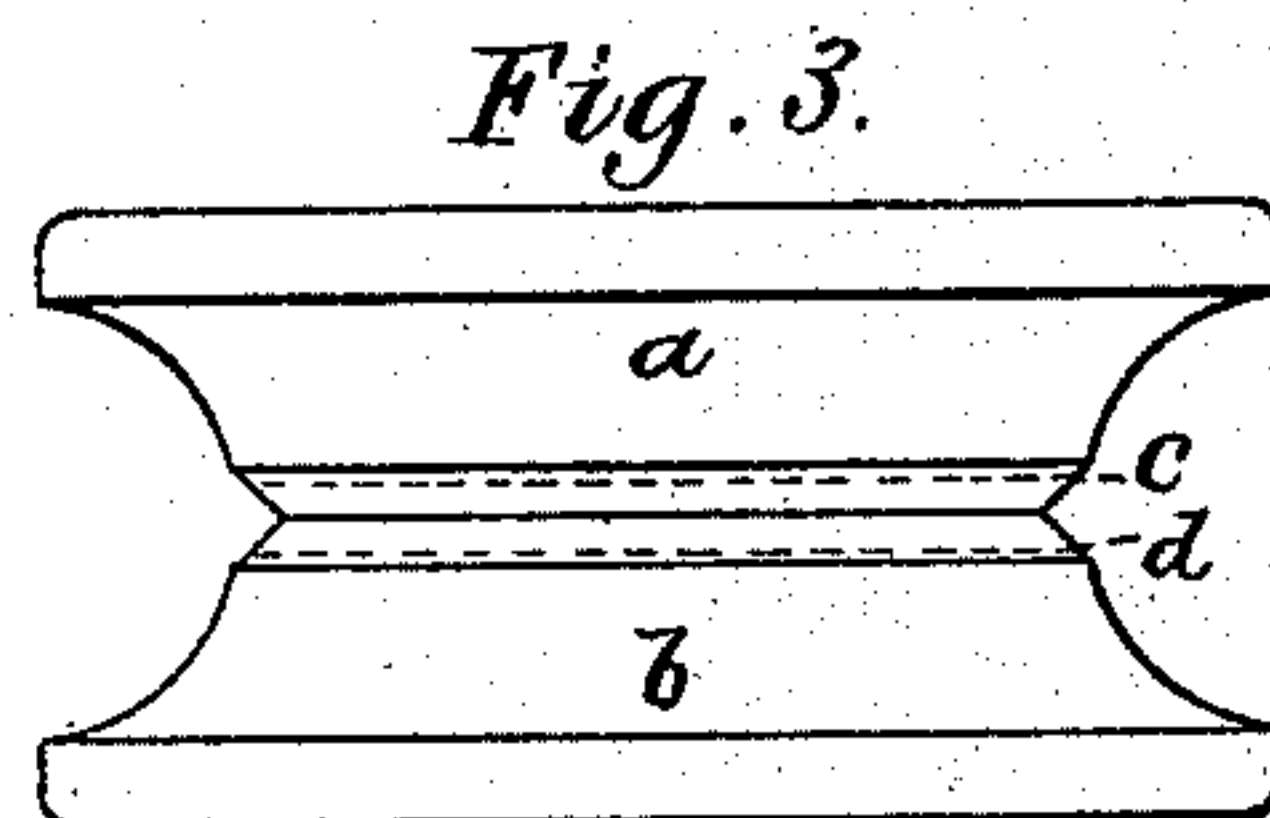
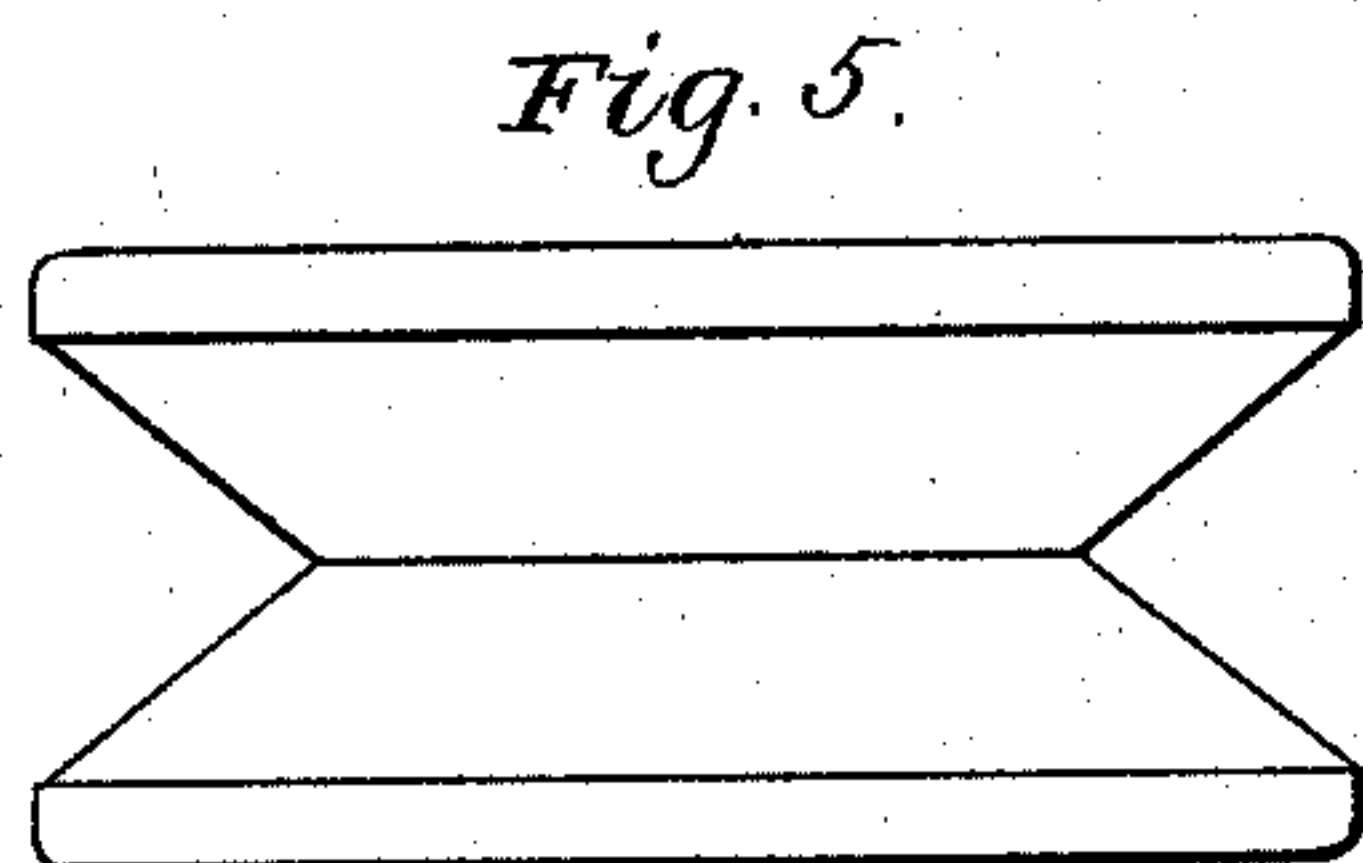
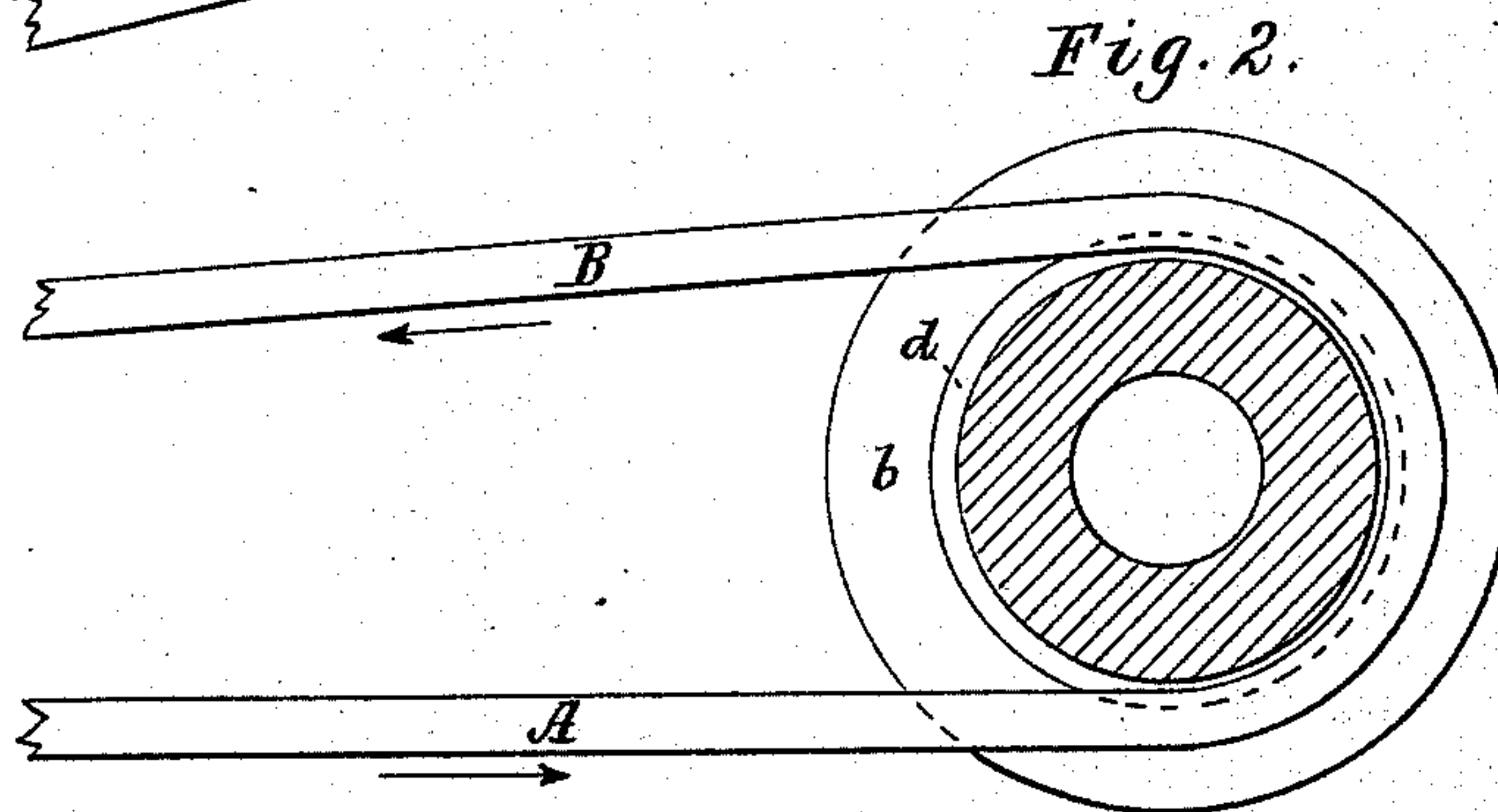
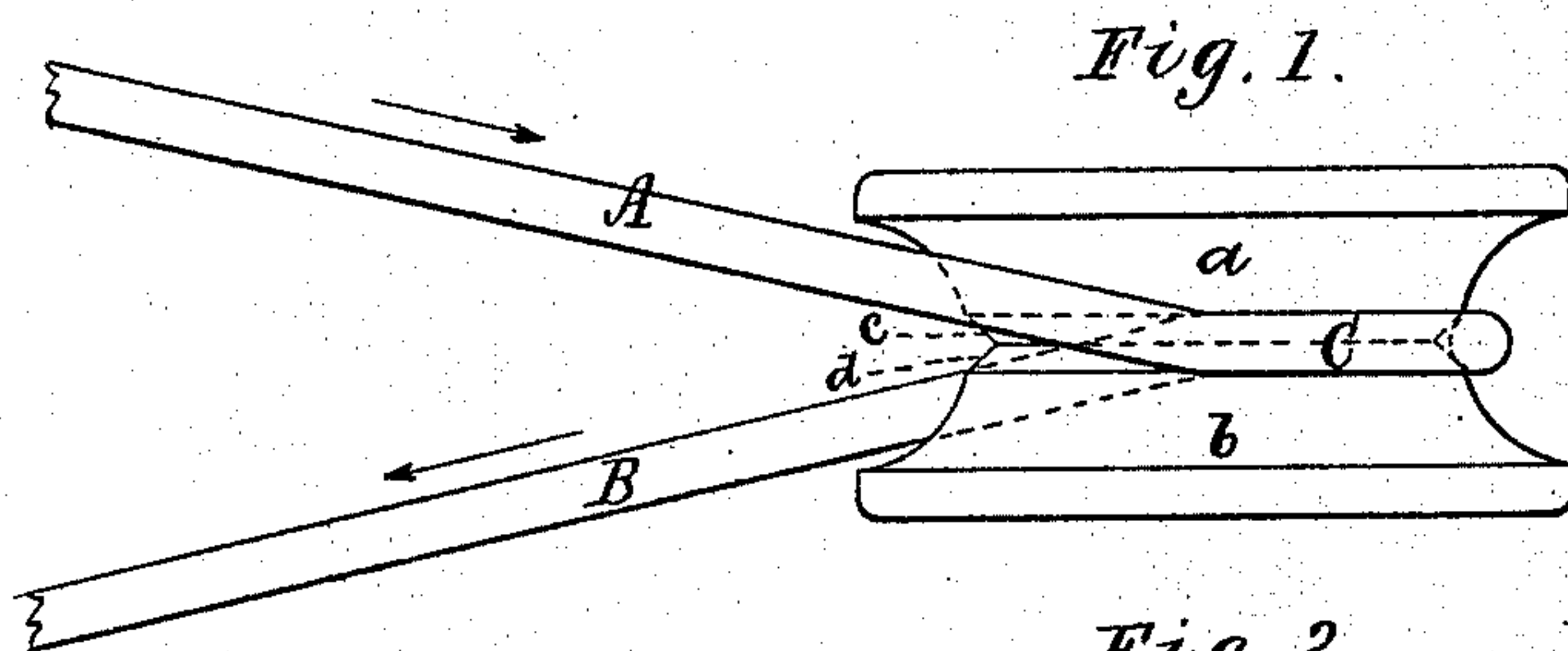
(No Model.)

J. BIRKENHEAD.

WHIRL FOR SPINNING SPINDLES.

No. 413,485.

Patented Oct. 22, 1889.



Witnesses

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# UNITED STATES PATENT OFFICE.

JOHN BIRKENHEAD, OF MANSFIELD, MASSACHUSETTS.

## WHIRL FOR SPINNING-SPINDLES.

SPECIFICATION forming part of Letters Patent No. 413,485, dated October 22, 1889.

Application filed January 19, 1889. Serial No. 296,887. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN BIRKENHEAD, a citizen of the United States, residing at Mansfield, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Whirls for Spinning-Spindles; and I do declare the following to be a full, clear, and exact description of the invention, such as 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 the letters and figures of reference marked thereon, which form a part of this specification.

Figure 1 is a side elevation, and Fig. 2 a horizontal section, on an enlarged scale, of a whirl having its groove made in accordance with my invention, the band being shown as in the position which it takes when applied to the whirl and to the driving-drum of an ordinary spinning-frame. Fig. 3 is a side elevation of the whirl without the band. Fig. 4 is a side elevation of a whirl embodying my invention, it showing slight modifications in the form of the groove. Figs. 5, 6, and 7 are views of whirls now in general use.

In the use, in a spinning-frame, of whirls having grooves formed as shown in Figs. 5, 6, and 7, and the band from the driving-drum passing partially around the whirl and moving in the direction as indicated in Figs. 1 and 2, the part A of the said band, moving in a downwardly-inclined direction from the drum to the whirl, will bear on a portion of the surface of the whirl above the middle of the groove which is of larger diameter, or farther away from the axis of the whirl than that portion of the whirl against which the part C of the band bears, and as the band leaves the whirl and moves in a downwardly-inclined direction from the whirl to the drum, as indicated at B, inasmuch as the part B of the band approaches the part A in a horizontal plane, it (the said part B) will bear on a portion of the surface of the whirl below the middle of the groove which is of still larger diameter or farther away from the axis of the whirl than that portion of the surface of the groove above its middle, against which the said part A of the band bears. This state of things causes a loss of speed to the whirl, a chafing of the band, and an unsteadiness of

motion, particularly when the knot or splice in the band strikes the portions of the surfaces above and below the middle of the groove above mentioned, which would not occur if the band did not touch the groove of the whirl in the portions indicated.

The object of my invention is to provide a whirl with a groove so formed that the band will not bear on portions of said groove farther away from the axis of the whirl than the line of contact of the part C of the band is on the surfaces of the groove above and below its middle.

In carrying out my invention I have devised several forms of groove which will practically overcome the trouble referred to.

Figs. 1, 2, and 3 of the drawings represent the groove as formed of two concave surfaces *a* and *b*, with two inclined surfaces *c* and *d* arranged between them, the latter surfaces joining each other in the middle of the groove. Fig. 4 represents the groove as slightly modified, it being formed of two concave surfaces *a* and *b*, with two convex surfaces *g* *h*, uniting in the middle of the groove, arranged between them, as shown, both forms of said grooves in cross-section approximating in shape an ogee arch, its base standing in a vertical position, the dotted lines representing the lines of contact of the band in either groove.

In either form of the grooves shown in Figs. 1, 2, 3, and 4 the band in moving downwardly, either toward or away from the whirl, will not bear on the surfaces *a* *b* farther away from the axis of the whirl than the line of contact of the part C of the band on said surfaces, and said surfaces being concave they afford a clearance-space for the splice or knot of the band to pass freely through, so that little, if any, jar is caused thereby to the whirl, and, furthermore, the band cannot run out of the groove in the whirl, as is often the case with that shown in Fig. 7.

Having described my invention, what I claim is—

1. A whirl for spinning-spindles, having its band-groove formed of two concave concentric surfaces and two concentric and inclined surfaces, the latter surfaces being arranged between the former and joining each other in the middle of the groove, the junction of

said inclined surfaces being nearer to the axis of the whirl than any other portion of said groove, substantially as shown and set forth.

2. A whirl for spinning-spindles, having its  
5 band-groove formed of two concentric concave surfaces and two concentric convex surfaces, the junction of the latter with each other being in the middle of the groove and nearer to the axis of the whirl than any other

portion of the said groove, substantially as shown and set forth.

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

JOHN BIRKENHEAD.

Witnesses:

S. N. PIPER,  
GEO. L. RIDLEY.