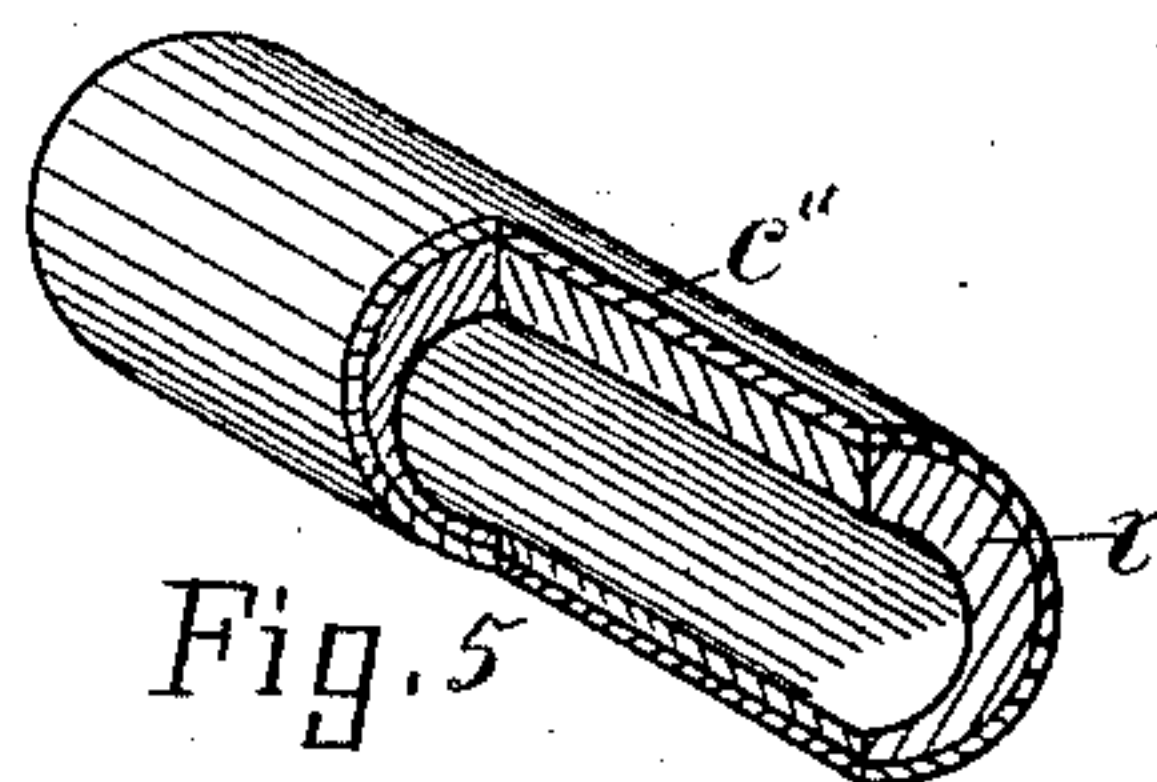
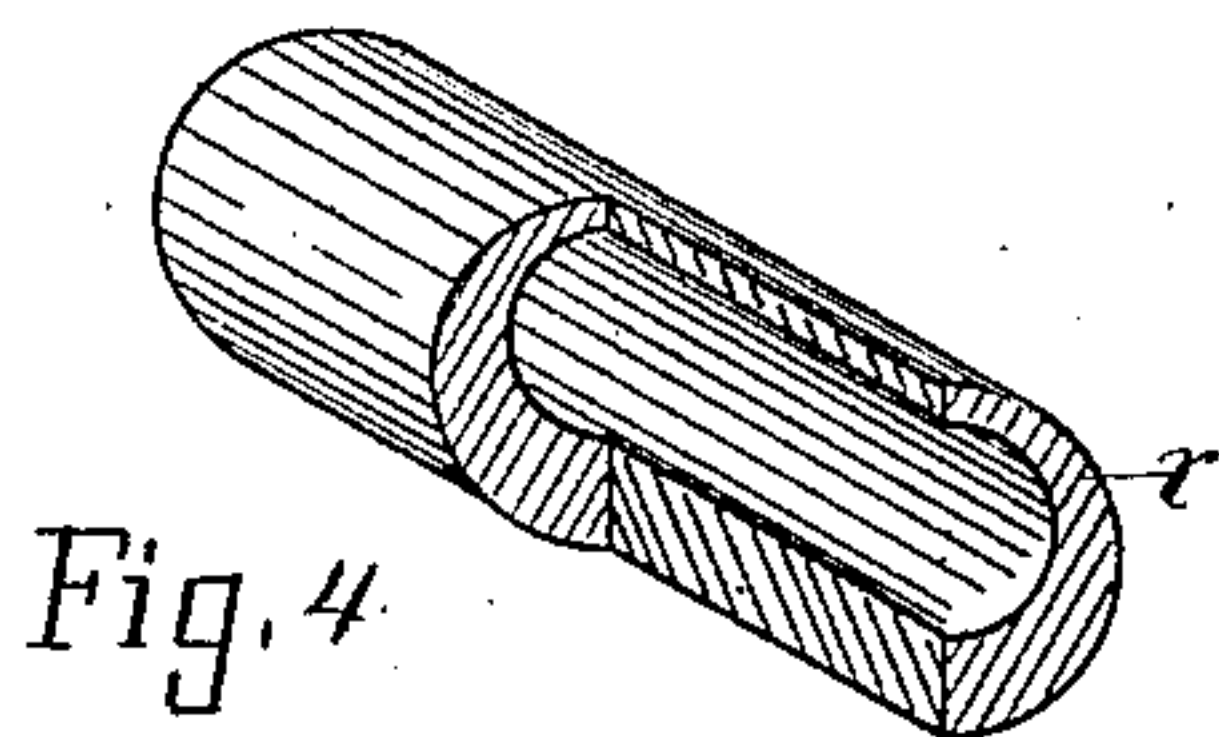
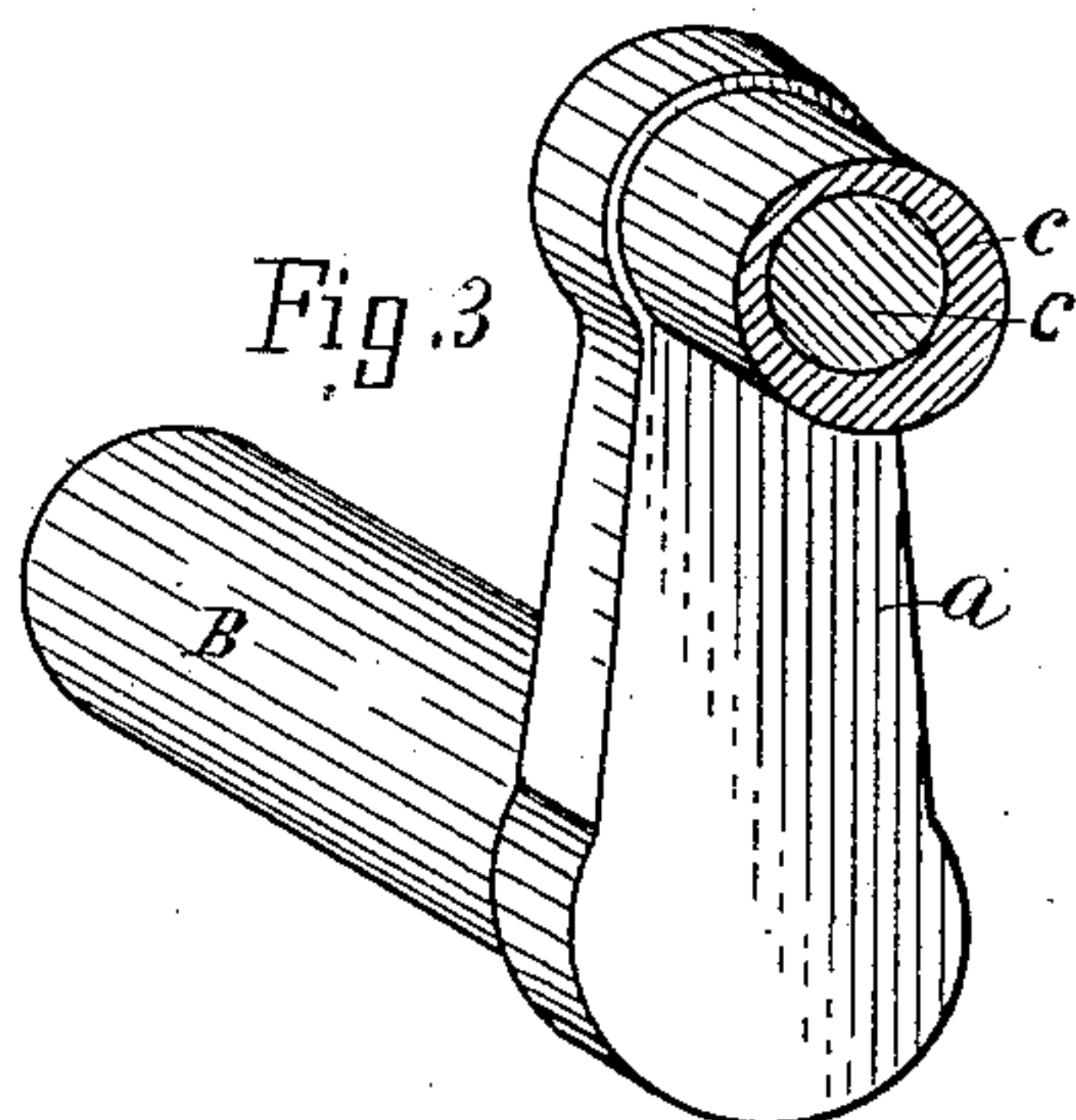
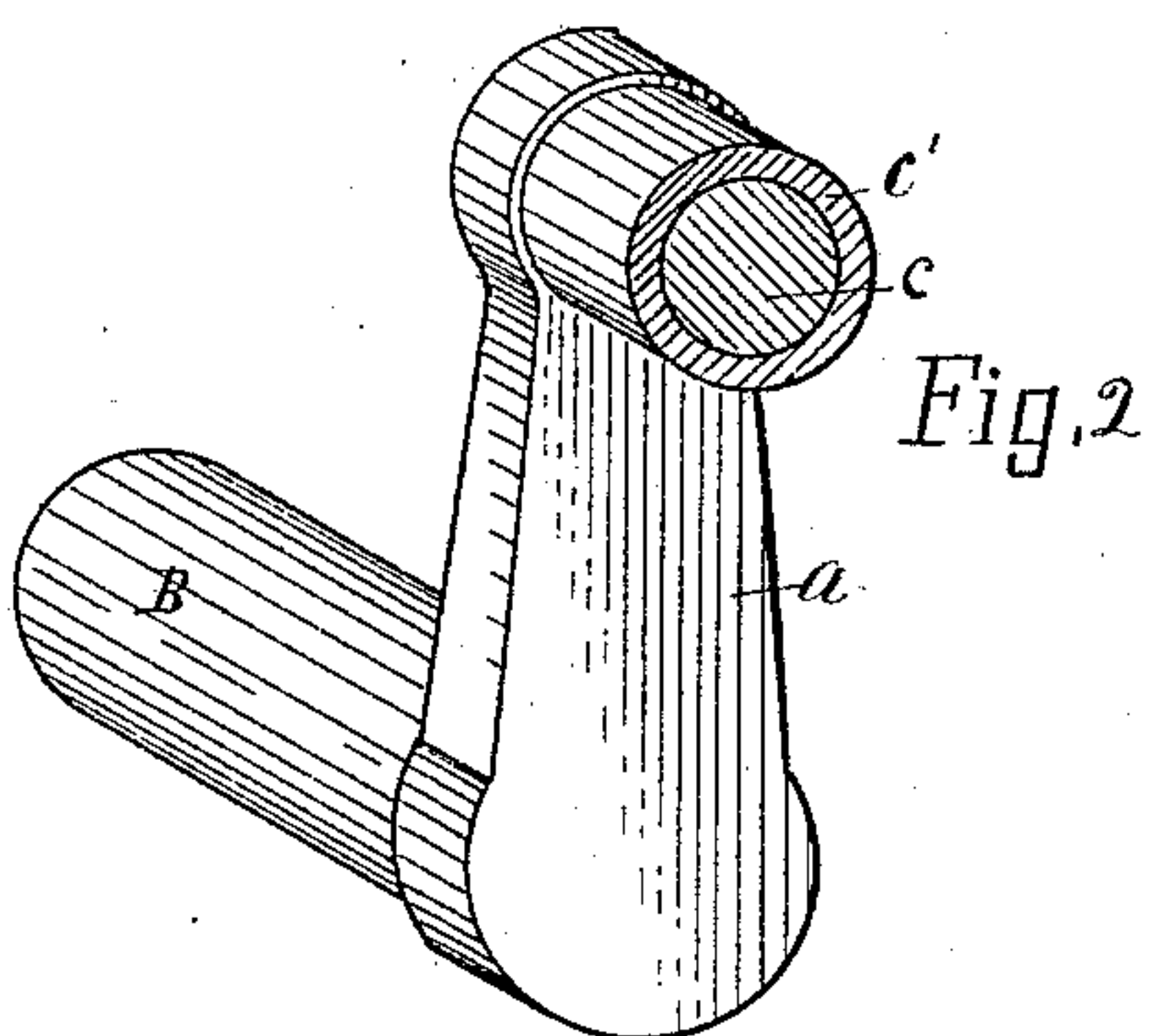
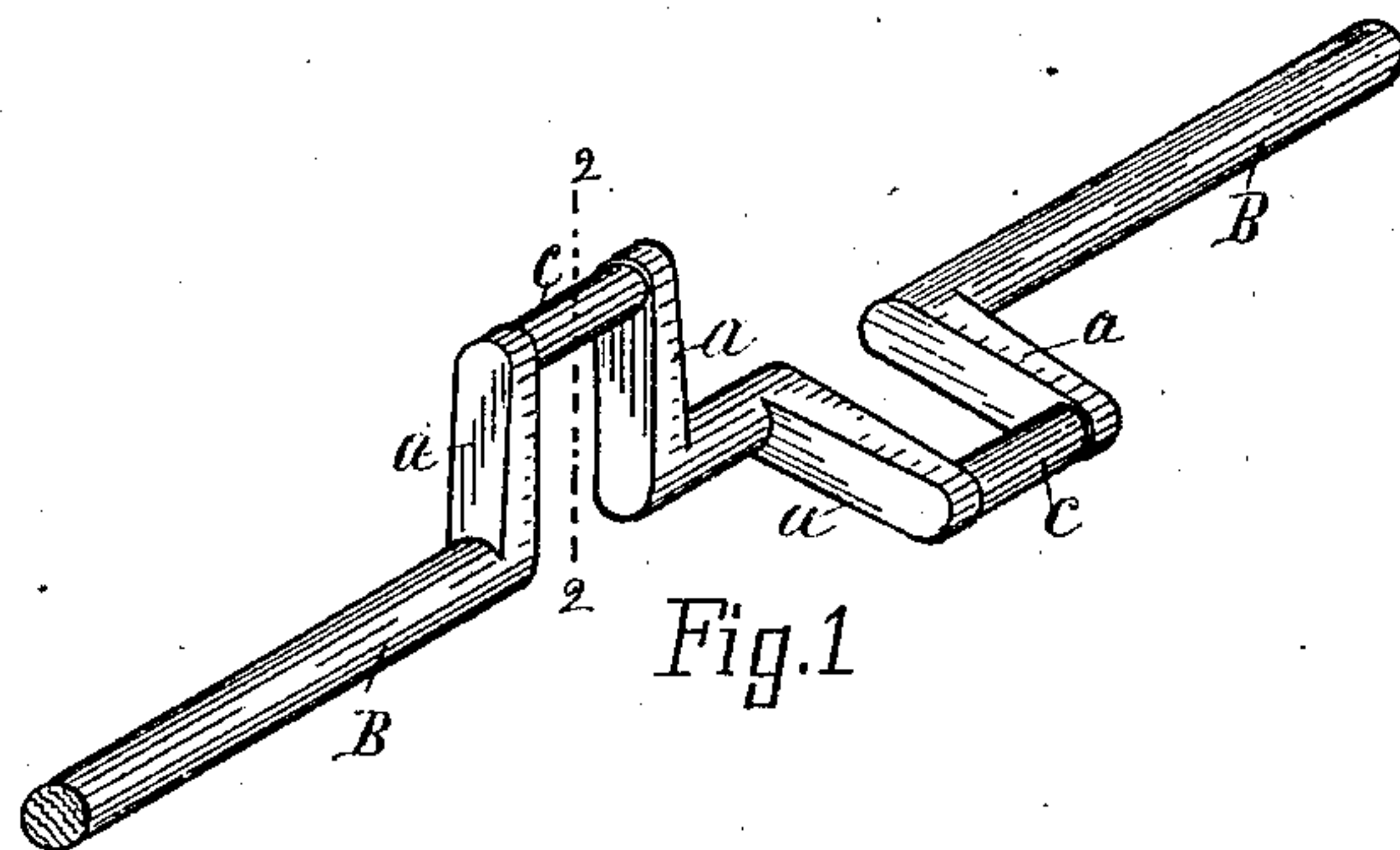


(No Model.)

P. A. PEER.
CRANK SHAFT.

No. 315,060.

Patented Apr. 7, 1885.



Witnesses.
John C. Perkins
Charles V. Chase

Inventor.
Perry A. Peer
By *Lucius C. West*
Atty.

UNITED STATES PATENT OFFICE.

PERRY A. PEER, OF COMSTOCK, ASSIGNOR OF ONE-HALF TO BRADLEY S. WILLIAMS, MALCOLM B. WILLIAMS, AND HOMER MANVEL, OF KALAMAZOO, MICHIGAN.

CRANK-SHAFT.

SPECIFICATION forming part of Letters Patent No. 315,060, dated April 7, 1885.

Application filed December 30, 1884. (No model.)

To all whom it may concern:

Be it known that I, PERRY A. PEER, a citizen of the United States, residing at Comstock, county of Kalamazoo, State of Michigan, have invented a new and useful Crank-Shaft Improvement, of which the following is a specification.

This invention consists in a construction, substantially as below set forth, to obviate the necessity of dressing off the wrist-pin of cranks in order to make them smooth after casting, or to fix the axial center of said wrist-pin at a given position and distance from the axial center of the crank-shaft.

In the drawings forming a part of this specification, Figure 1 is a perspective view of a crank-shaft containing two double cranks. Figs. 2 and 3 are enlarged perspective views of halves of a double crank, the wrist being in cross-section at a point illustrated by the line 2 2 intercepting the wrist in Fig. 1; and Figs. 4 and 5 are enlarged broken details in perspective, hereinafter explained.

Referring to Fig. 1, the arms *a a*, bent out at right angles from the shaft *B* and connected at their free ends with the wrist *c*, illustrate the style of cranks to which this invention more particularly refers, the same being known as "double cranks," as it is with great difficulty and expense (and often an impossibility) that such cranks are dressed and made true ready for use after casting. The invention, however, may be applied to single cranks at a great saving of time and expense. It is necessary that the wrists *c* shall be smooth, and that the horizontal centers of the shaft and wrist shall be parallel and a given distance from each other. The invention to effect these results consists in casting melted metal around the wrist of the crank. Babbitt metal or other suitable metal may be used. As the process of treating the wrists of cranks in this manner is to be the subject of another application for a patent, its details will not be herein given.

In Fig. 3 the wrist *c* of the crank, after having been cast, illustrates a frequent occurrence, the axial center being both horizontally, vertically, and a little obliquely out of proper position; but by holding a mold around the wrist of a proper size and at a proper po-

sition, and casting on the metal band *c'*, the axial center of the then complete wrist, which includes the band, is at the proper point.

A point of great economy and convenience is that when the band becomes unduly worn the wrist can be treated in the same manner again, saving the expense of a new crank-shaft.

In some instances the band would serve only to provide a smooth wearing-surface, and to make the complete wrist of a proper size. *c'* in Fig. 2 illustrates the idea.

As an equivalent to the above plan, the wrist *c* in casting it, and the crank-shaft and arms, may be cast within a previously-molded metal band. Fig. 2 will serve also to illustrate the equivalent.

Another equivalent is shown in Fig. 5, in which two bands, *c'' r*, are formed on the wrist, either by casting first one band and then the other to secure a different wearing-surface, or by casting the band *r* between the previously-formed band *c''* and the crank-wrist. Fig. 4 shows the band *r*. This band also serves to illustrate the form of band *c'*. In Figs. 4 and 5 the crank-wrist *c* is removed, the internal hollow showing the position it would occupy.

This style of crank-shafts, Fig. 1, is desirable to use in wind-engines in which power-transmitters are employed for running machinery. It is necessary that they be made cheaply and strong, and hence they are cast out of iron. Great accuracy is also necessary and smoothness of the wrist, as before stated. For these reasons, previous to my invention such crank-shafts in wind-engines have been almost exclusively experimental productions and illustrations on paper.

Having thus described my invention, what I claim is—

A crank provided with a cast-metal covering on the exterior surface of its wrist, or its specified equivalents, substantially as set forth.

In testimony of the foregoing I have hereunto subscribed my name in presence of two witnesses.

PERRY A. PEER.

Witnesses:

BARTLETT A. NEVINS,
MALCOLM B. WILLIAMS.