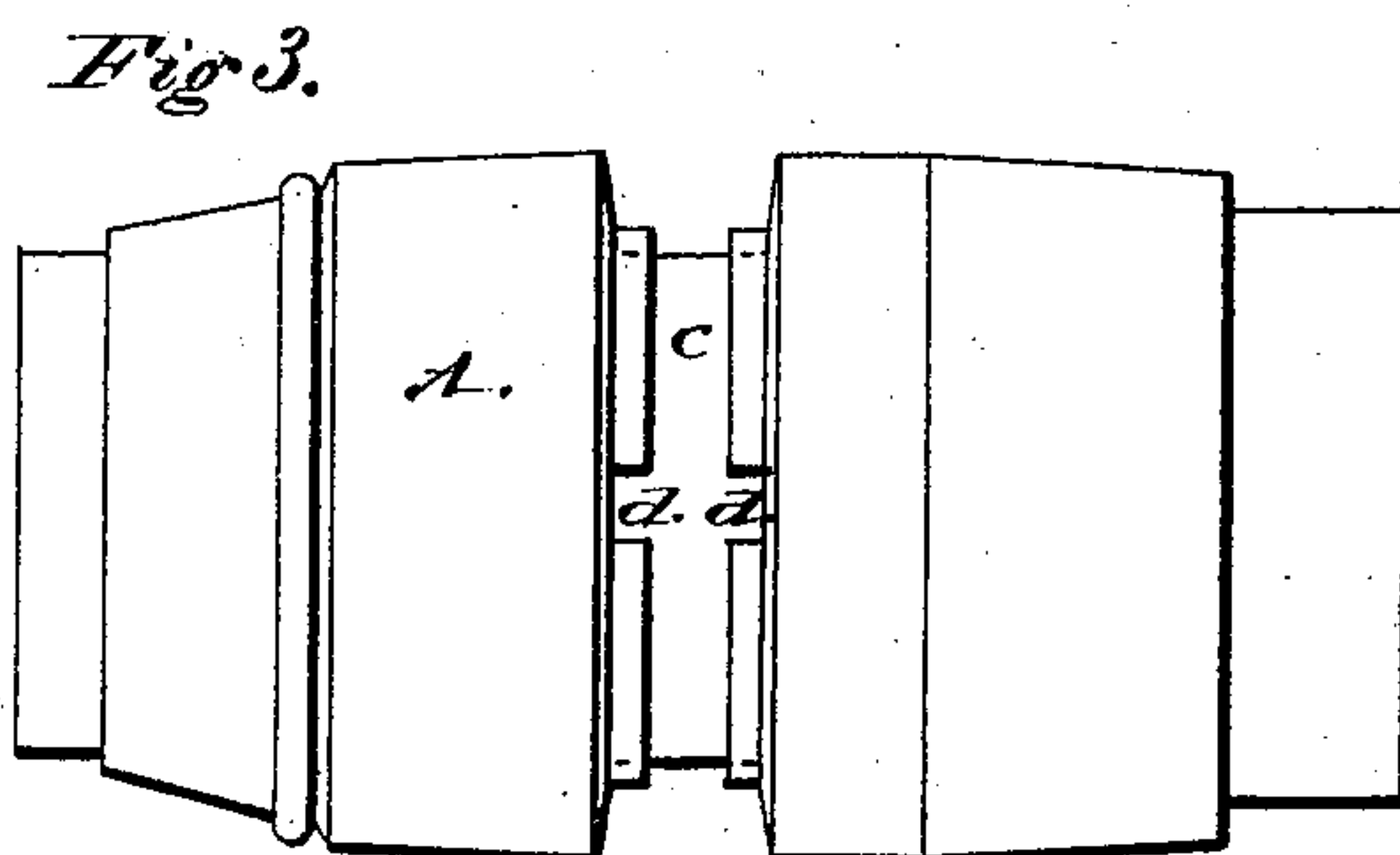
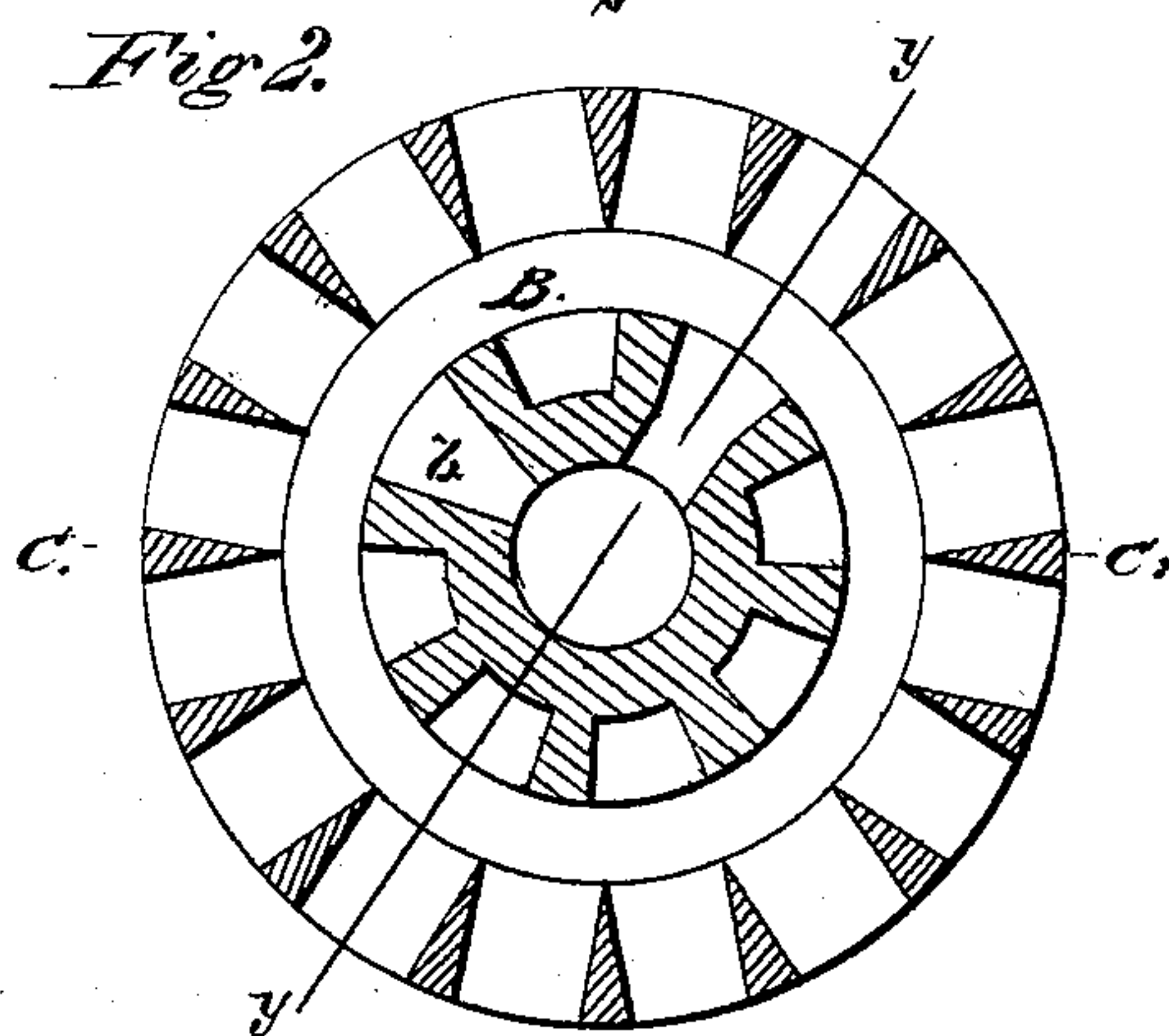
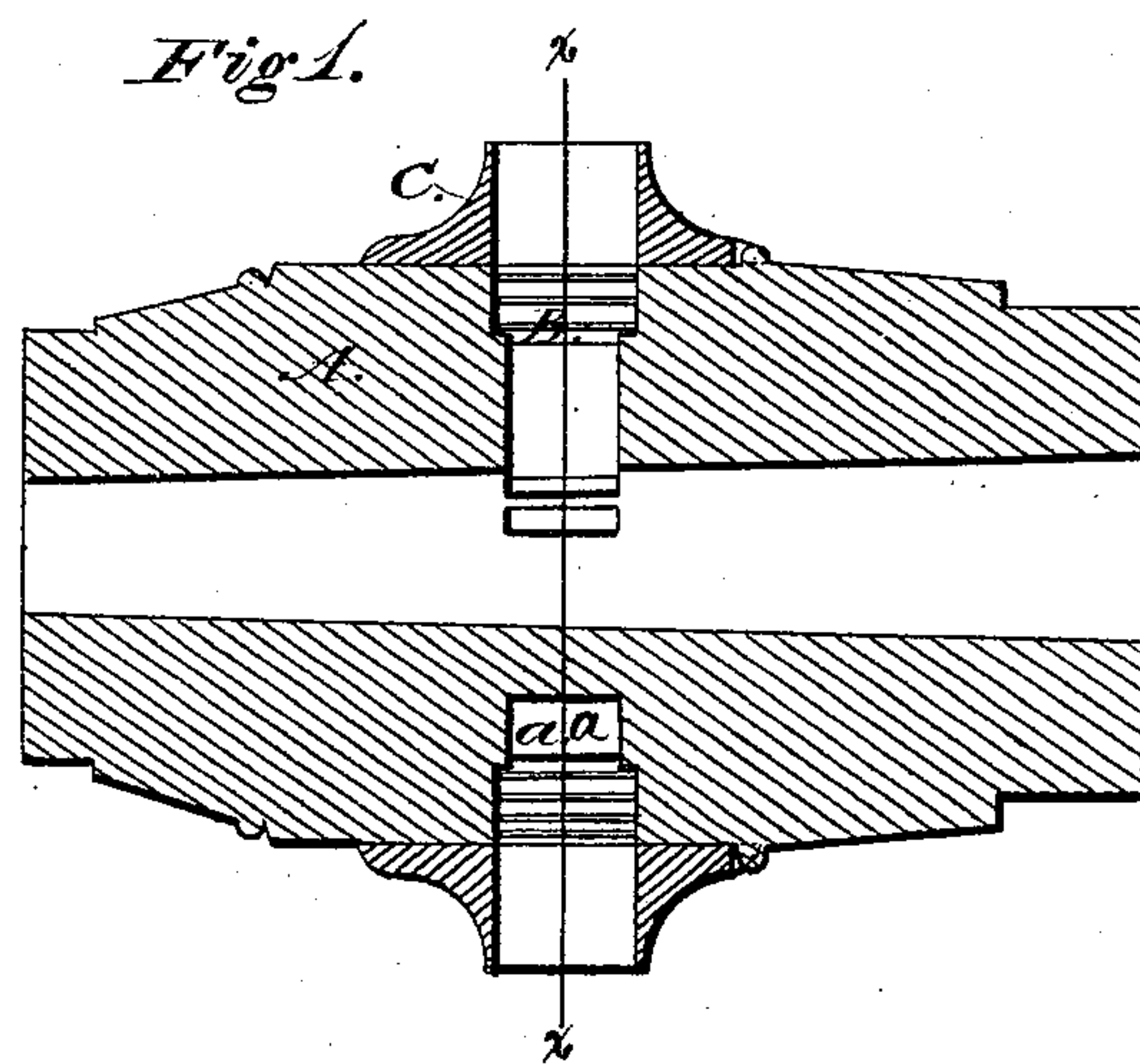


S. D. FORBES.
Wheels for Vehicles.

No. 148,438.

Patented March 10, 1874.



Witnesses.

Edw. W. Down
Chas. W. Forbes

Inventor.

Samuel S. Forbes

UNITED STATES PATENT OFFICE.

SAMUEL D. FORBES, OF WILMINGTON, DELAWARE.

IMPROVEMENT IN WHEELS FOR VEHICLES.

Specification forming part of Letters Patent No. **148,438**, dated March 10, 1874; application filed December 21, 1872.

To all whom it may concern:

Be it known that I, SAMUEL D. FORBES, of the city of Wilmington, county of New Castle and State of Delaware, have invented a new and useful Improvement in Hubs for Carriage-Wheels; and I hereby declare that the following is a true and exact description thereof, reference being had to the accompanying drawing forming a part of this specification, in which—

Figure 1 represents a longitudinal section on the line *y y*, Fig. 2. Fig. 2 represents a cross-section on the line *x x*, Fig. 1. Fig. 3 illustrates a modification of my invention, hereinafter more fully described.

My invention relates to that class of hubs having an encircling groove turned therein, and surrounded by a metallic band with mortises, through which the spokes pass into said groove; and it consists in forming recesses or a supplementary groove and notches in the bottom of an upper groove, to receive the inner end of the body of the spokes, and thereby prevent the band and spokes from turning upon the hub.

A represents the middle or wooden portion of the hub, having the circumferential groove B turned therein, and C the metallic band encircling the wooden portion of the hub. *a a* are recesses cut in the bottom of the groove B, of sufficient depth to form a shoulder for the inner ends of the spokes, and prevent them from turning on the hub. *b b*, Fig. 2,

are recesses extending to the core of the hub, and arranged opposite the recesses *a a*, but may be alternately cut with the recesses *a a* entirely around the hub.

Fig. 3 shows a hub having a supplementary groove or channel, *c*, in the bottom of the groove B, completely encircling the hub, and having recesses *d d* on either side of said channel, of the same depth. The space in the channel between the recesses *d d* may be filled with tenons cut on the spokes to correspond, thereby rendering the space solid.

Except as to said recesses and supplementary groove arranged in the bottom of the groove B, and forming the spokes without tenons, my hub differs essentially from other hubs having an encircling groove.

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

1. A banded and circumferentially-grooved hub, having the recesses *a a* formed in the bottom of said groove to receive the butt-ends of one or more spokes without tenons, substantially as described, and for the purpose herein set forth.

2. The supplementary groove or channel *c*, with recesses *d d*, arranged on either side of the channel, substantially as described.

SAMUEL D. FORBES.

Witnesses:

CHAS. W. FORBES,
C. A. WYNDHAM.