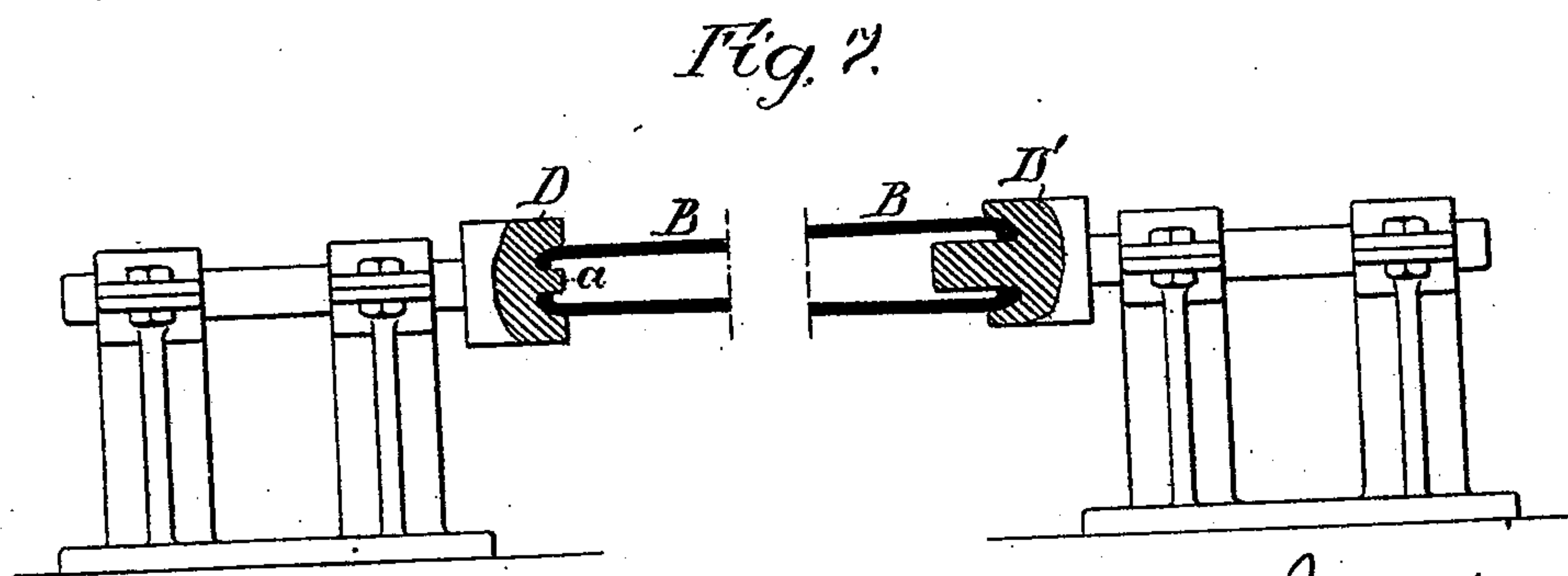
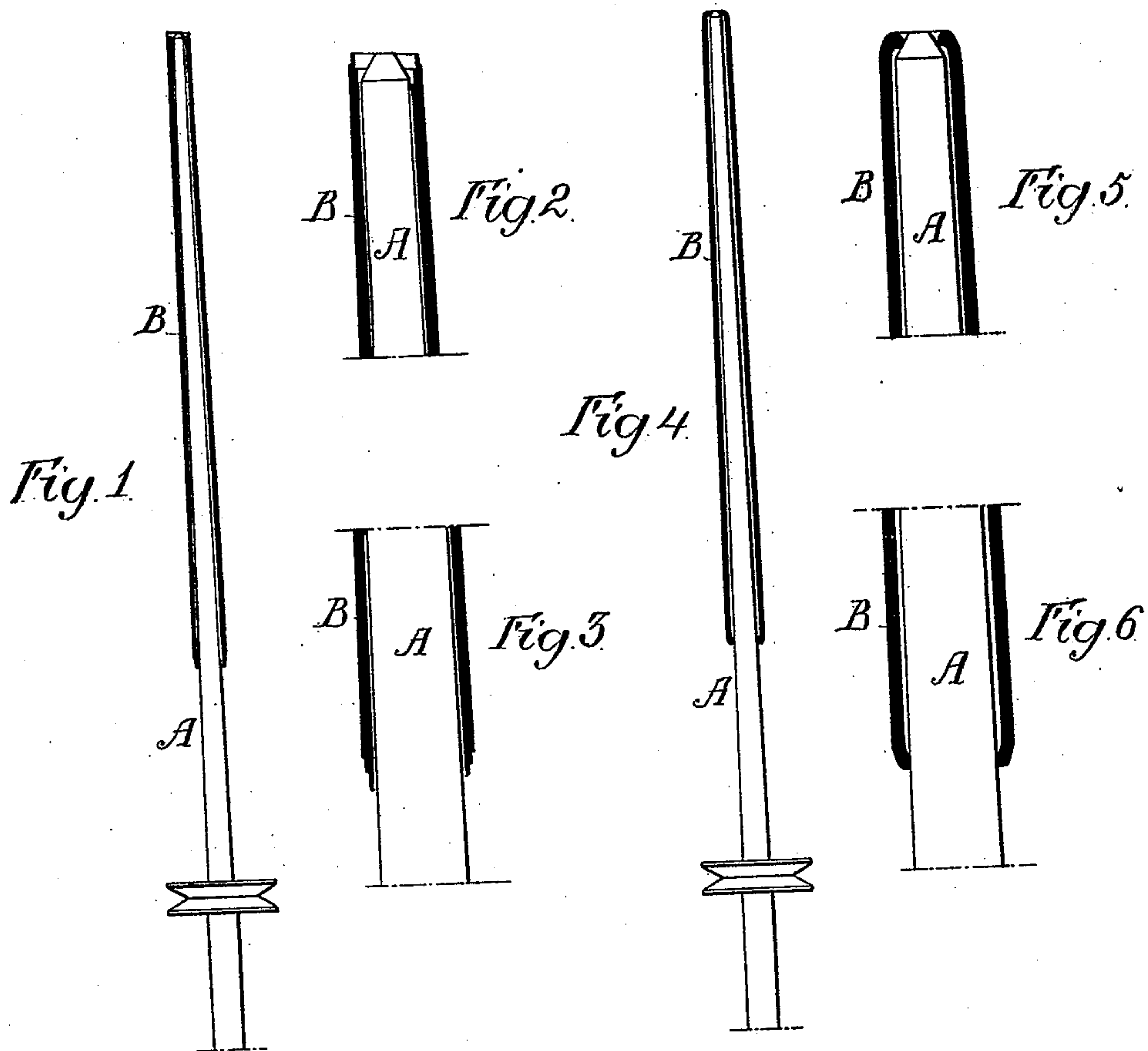


W. J. McCAUSLAND.  
Paper Cop-Tube.

No. 227,281.

Patented May 4, 1880.



Witnesses  
M. Deemer.  
Harry Smith

Inventor  
William J. McCausland  
by his Attorneys  
Howson & Co

# UNITED STATES PATENT OFFICE.

WILLIAM J. McCAUSLAND, OF PHILADELPHIA, PENNSYLVANIA.

## PAPER COP-TUBE.

SPECIFICATION forming part of Letters Patent No. 227,281, dated May 4, 1880.

Application filed September 20, 1879

*To all whom it may concern:*

Be it known that I, WILLIAM J. McCAUSLAND, of Philadelphia, Pennsylvania, have invented a new and useful Improvement in  
5 Paper Cop-Tubes, of which the following is a specification.

My invention consists of a paper cop-tube made smooth, hard, and rounding at the upper end or at both ends, as described hereinafter,  
10 so as to dispose of the ragged edges which frequently cut the threads and interfere with the proper spinning of the same.

In the accompanying drawings, Figure 1 represents a spindle with an ordinary cop-tube  
15 in section; Figs. 2 and 3, enlarged views of parts of Fig. 1; Fig. 4, a view of a spindle with my improved cop-tube in section; Figs. 5 and 6, views of parts of Fig. 4; and Fig. 7, a view of mechanism which may be used in carrying  
20 out my improvement.

In Figs. 1, 2, and 3, A is the ordinary spindle, and B the usual cop-tube, made of paper and adapted to the spindle, as shown. These  
25 tubes are made by rolling and pasting strips of paper, the upper and lower ends of the tubes being left in a ragged condition, which is objectionable, especially on the upper end of the tube, as the sharp and thin projecting edges of the paper frequently cut the threads  
30 and otherwise interfere with the proper spinning of the same.

In order to overcome this defect, I push the upper end of an ordinary cop-tube against a rapidly-rotating die, D, of the shape shown in  
35 Fig. 7, this die having a circular recess, from which projects a central pin, *a*, into the tube. The effect of this rapidly-revolving die on the tube is to condense the paper and reduce the ragged end to the smooth rounded termination shown in Fig. 5, the rounded surface  
40 being hard and uniform, so that it cannot have any injurious effect on the thread in spinning. The die has also the effect of compressing the end of the tube inward to the extent de-

termined by the central projection, *a*, which is  
45 of such a diameter that the tube will fit on the end of the spindle in the manner shown in Fig. 5.

The internal turning of the end of the tube by the projection *a* has a tendency to insure  
50 the proper centering of the said tube on the spindle.

It is not essential that the lower end of the tube should be subjected to the above-described process; but I prefer to treat both ends  
55 in the same manner, the lower ragged end of the tube being pressed against the die D', Fig. 7, which results in solidifying, smoothing, rounding, and internally truing this end of the  
60 tube.

I am aware that a paper cop-tube has been contracted at the tip, whereby a firm frictional contact of the top of the tube with the spindle is assured; but this was effected without  
65 such solidifying and compressing of the paper as to result in the hard polished end, which is the characteristic of my improved cop-tube.

I am also aware that a paper cop-tube has been bent inward at the lower end, so as to form an internal flange for bearing against the  
70 spindle; but this also was accomplished without condensing, hardening, and smoothing the said lower end of the cop-tube.

Without claiming broadly, therefore, the formation of an internal flange at the ends of  
75 the tubes,

I claim as my invention and as a new manufacture—

A paper cop-tube condensed, hardened, polished, and rounded at one or both ends, as set  
80 forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WM. J. McCAUSLAND.

Witnesses:

ALEXANDER PATTERSON,  
HARRY SMITH.