

F. Millward,

Spinning Top,

N^o 24,430.

Patented June 14, 1859.

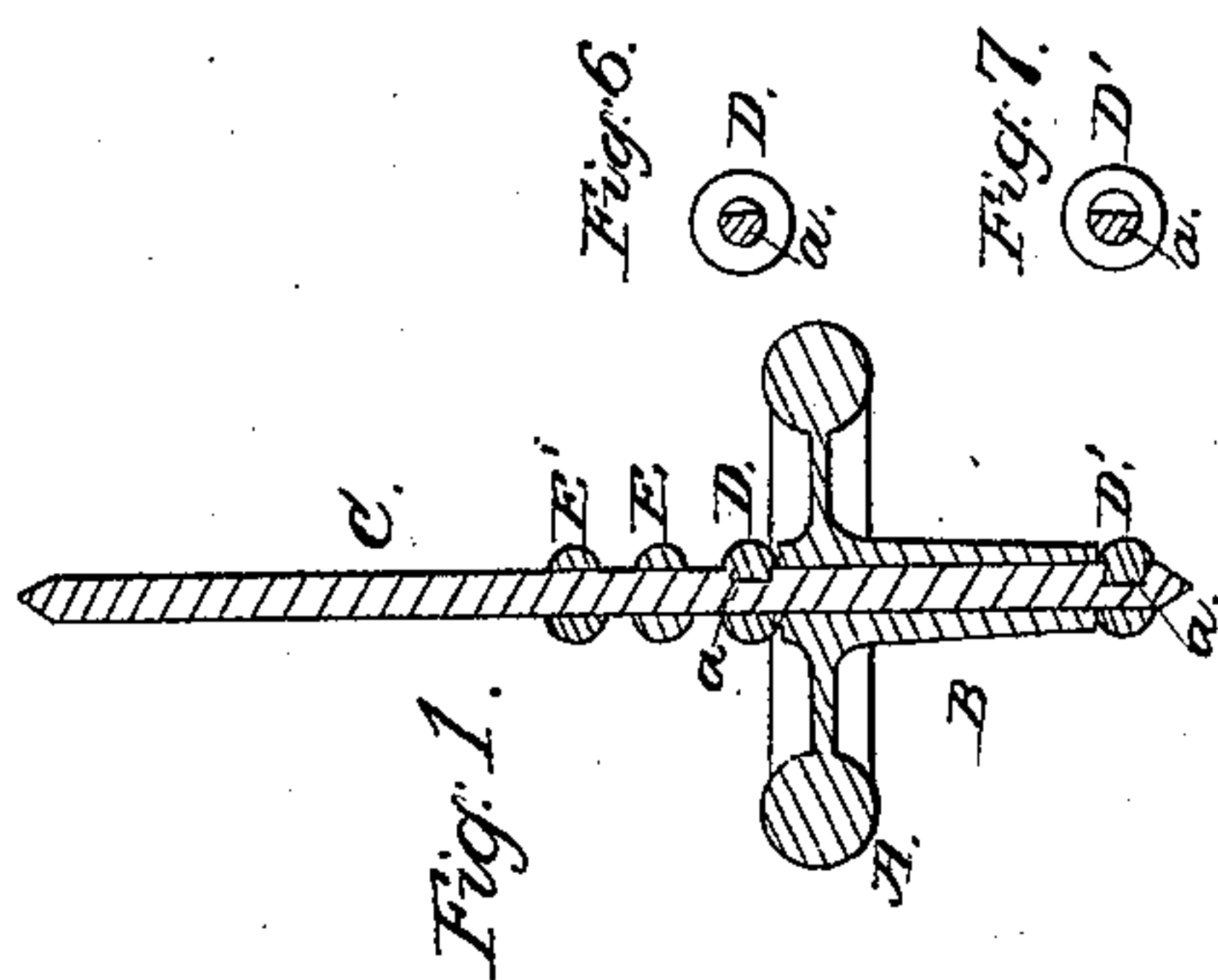
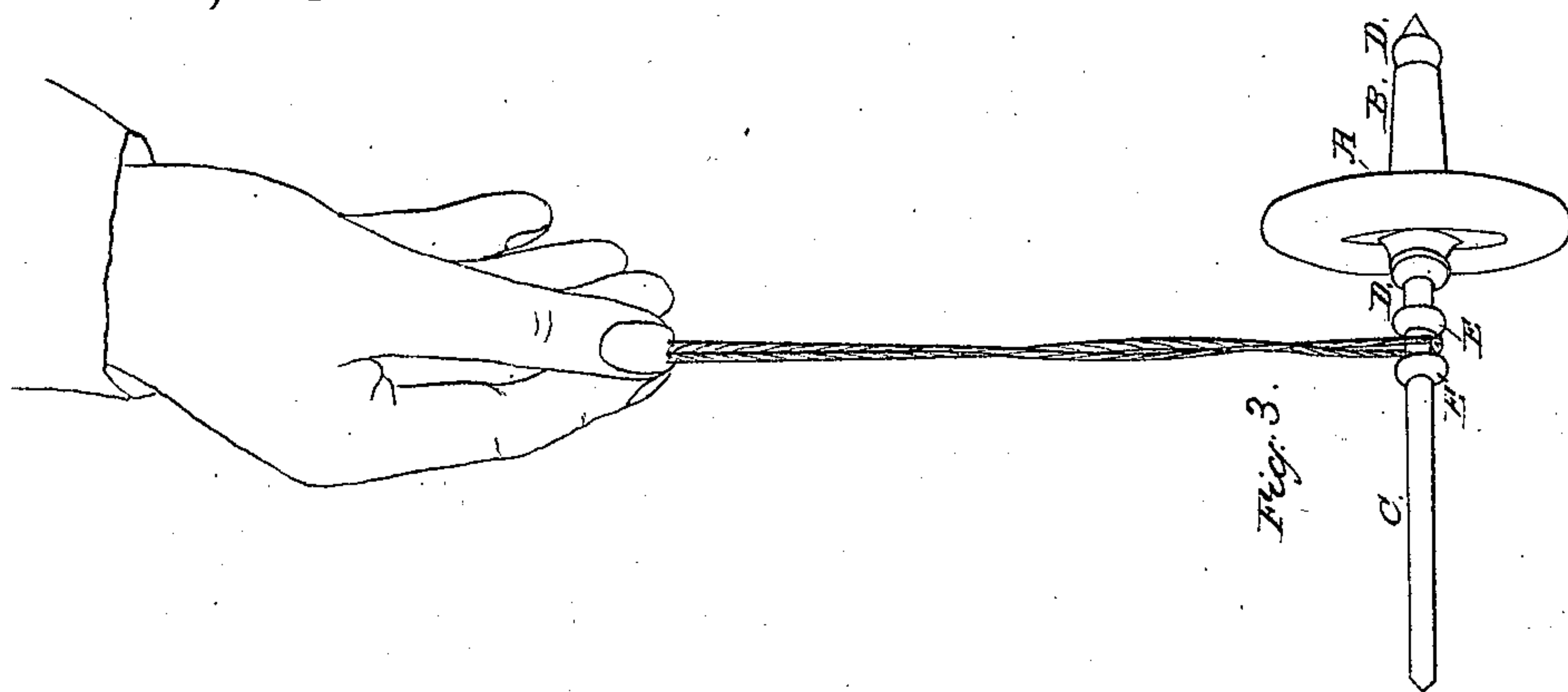


Fig. 6.

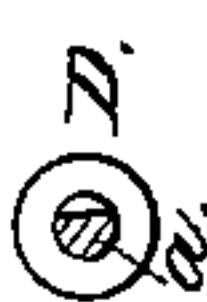


Fig. 7.

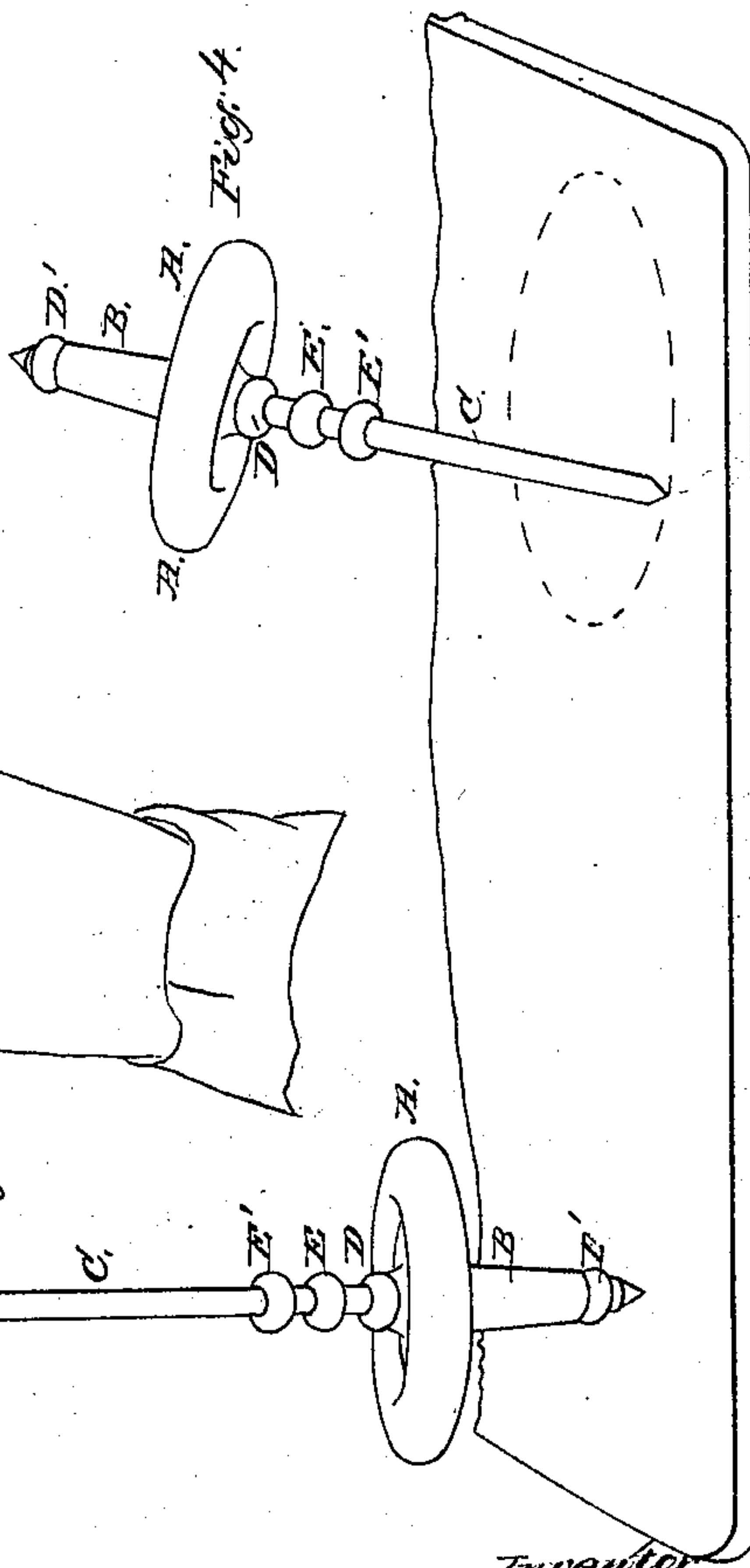


Fig. 4.

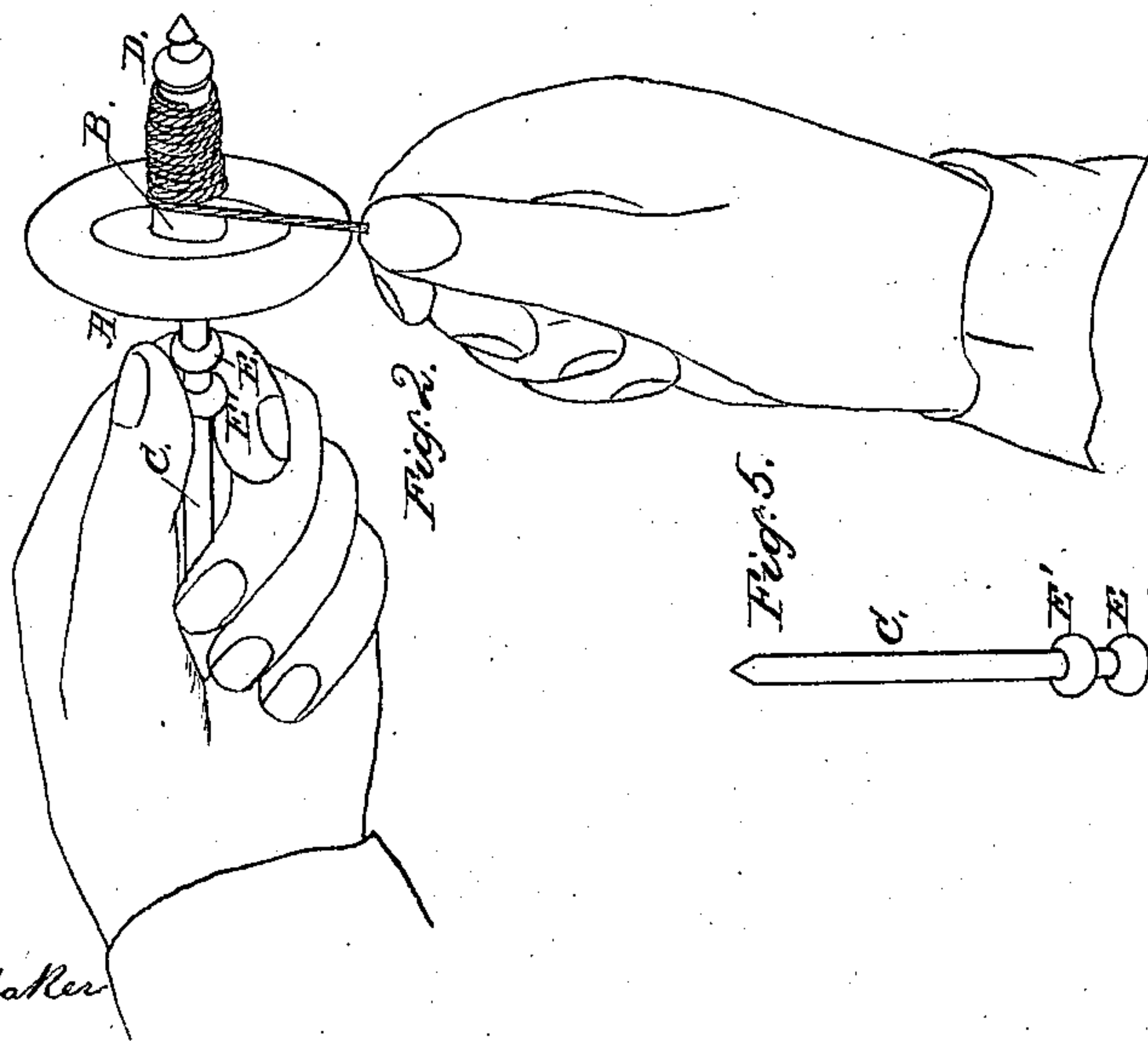
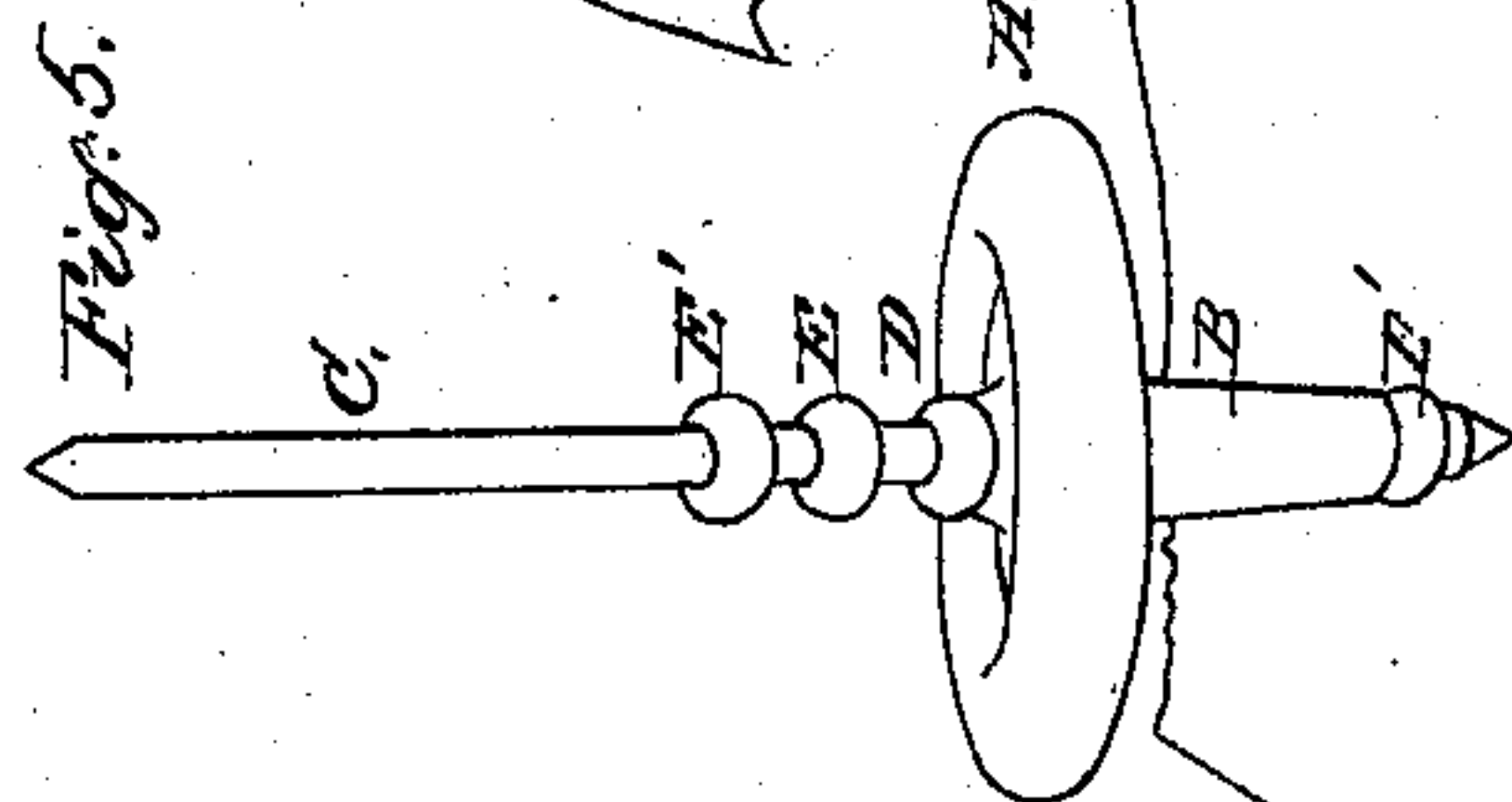


Fig. 2.

Fig. 5.



Witnesses.
Sam^l H. Whitaker
C. Steemer, Jr.

Inventor.
F. Millward.

UNITED STATES PATENT OFFICE.

FRANCIS MILLWARD, OF CINCINNATI, OHIO, ASSIGNOR TO H. HOMAN, W. L. THOMAS, AND
D. D. HARDY, OF SAME PLACE.

SPINNING-TOP.

Specification of Letters Patent No. 24,430, dated June 14, 1859.

To all whom it may concern:

Be it known that I, FRANCIS MILLWARD, of Cincinnati, Hamilton county, Ohio, have invented a new and useful Combined Gyroscope and Spinning-Top; and I do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings, making part of this specification.

10 The subject of this invention is a philosophical top designed to illustrate in a compact and inexpensive form various motions and forces incident to gyroscopes and to spinning tops; and it consists of a peculiar
15 arrangement of spindle and momentum wheel adapted for use in the various ways referred to and dispensing with the customary encircling frame of the gyroscope.

In the accompanying drawings Figure 1, 20 is an axial section. Fig. 2 is a perspective view illustrating the manner of setting the apparatus in motion. Fig. 3, is a perspective view illustrative of the gyroscope action. Figs. 4 and 5 exhibit the instrument spinning
25 as a common top on the long and short ends respectively.

This toy may be economically manufactured as follows:—

30 A is a momentum or fly wheel with a somewhat prolonged hub B, for the purposes both of stability and of winding (see Fig. 2). This wheel may be of white metal cast upon a polished steel core—whose withdrawal will leave the required aperture in
35 the hub B, to receive the spindle C.

The spindle C, may be made of steel wire and should be pointed at each end to facilitate spinning, when used as a top.

40 The spindle C, should be notched at *a, a*, (by a quick operation) to retain securely to their places on the spindle collars D, D', E, E', which are cast in white metal—fast upon it.

The collars D, D', confine the momentum wheel A—to its place on the spindle C—and the collars E, E', perform a like office for the string by which the instrument is suspended when exhibited as a gyroscope (see Fig. 3).

The composition of the wheel and collars may be the alloy known as Britannia metal.

The construction selected for the present illustration is that preferred by me—but an inferior modification may have the momentum wheel fast upon the spindle as in the common spinning top and in the common gyroscope, a loose sleeve being mounted upon the spindle to afford facility for prehension and suspension. The said sleeve is preserved from longitudinal displacement
60 by collars or a groove upon the spindle and is itself furnished with collars to retain the suspending string to its place.

Another modification may consist in substituting grooves for the collars D, D', E, E',
65 thus; instead of the collars D, D', a single groove in the spindle may receive a pin—projecting inwardly through the hub—and another groove in the spindle may take the place of the collars E, E'.
70

It will be seen that this apparatus entirely dispenses with the external frame common with gyroscope and admits of being taken in the hand while spinning and removed from place to place without arresting the
75 motion of the momentum wheel.

I claim as new and of my invention—

A combined gyroscope and spinning top constructed and operating substantially in the manner set forth.
80

In testimony of which invention, I hereunto set my hand.

FRANCIS MILLWARD.

Witnesses:

WM. L. THOMAS,
D. D. HARDY.