(No Model.)

J. ROYLE, Jr., & V. ROYLE.

SPINDLE AND FLIER FOR SPINNING MACHINES.

No. 271,521. Patented Jan. 30, 1883.

Fig 1.

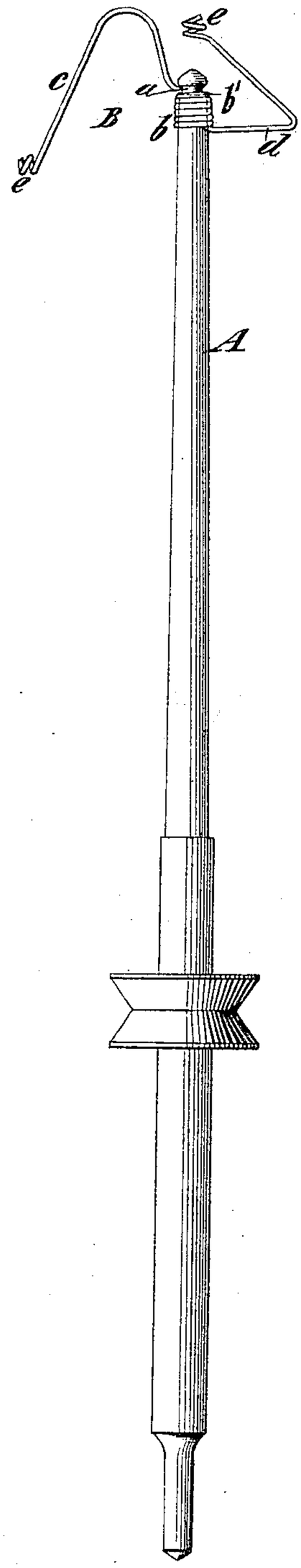


Fig 4.

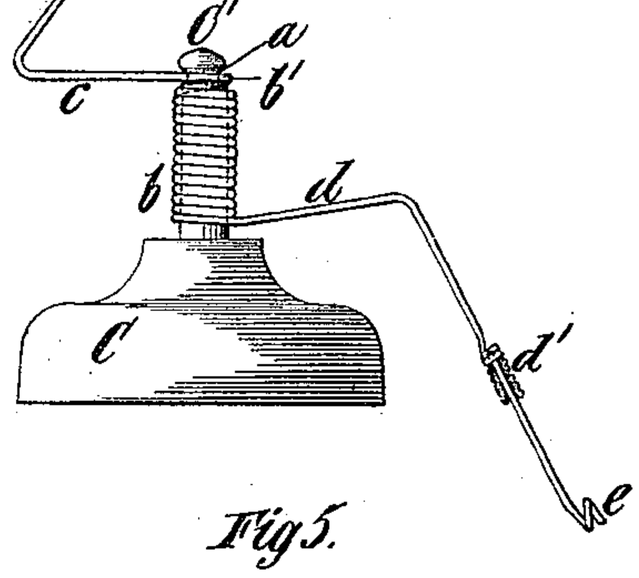


Fig 5.

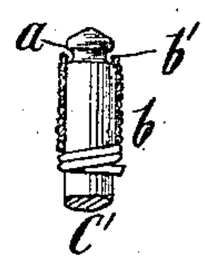


Fig 3.

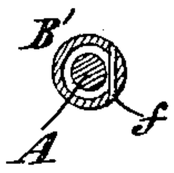
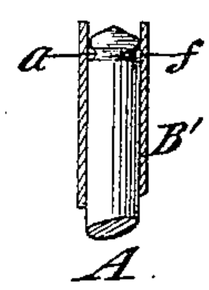


Fig 2.



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UNITED STATES PATENT OFFICE.

JOHN ROYLE, JR., AND VERNON ROYLE, OF PATERSON, NEW JERSEY.

SPINDLE AND FLIER FOR SPINNING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 271,521, dated January 30, 1883.

Application filed April 3, 1882. (No model.)

To all whom it may concern:

Be it known that we, JOHN ROYLE, Jr., and VERNON ROYLE, both of Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Spindles and Fliers for Spinning-Machines, of which the following is a specification.

This invention, which relates more generally to spindles and fliers used in spinning silk, is or may be applicable to all the various kinds of spindles used in spinning, whether rotary or fixed, in which the flier turns freely on the spindle.

The object of the invention is to provide fliers which may be more cheaply made; and the invention consists in the combination, with a spindle provided with an annular groove, of a flier the hub of which is provided with a fastening device entering said groove, and providing for the turning of the flier on the spindle, while confining it longitudinally thereon.

The invention also consists in the combination, with such a grooved spindle, of a flier the hub of which is formed of coiled wire, and one coil of which is slightly contracted, so as to engage with the groove in the spindle and prevent the flier from becoming accidentally raised off the spindle, while it will not prevent the flier from being removed by a slight force when desired.

In the accompanying drawings, Figure 1 represents a side view of a spindle and flier embodying our invention. Fig. 2 represents a similar view of the top of a spindle and a section of a flier-hub of modified form, also embodying our invention. Fig. 3 represents a transverse section of the parts shown in Fig. 2. Fig. 4 represents a side view of a "bobbin-top" or "doubler-weight" and a flier, also embodying our invention; and Fig. 5 represents a side view of the tip of the spindle and a section of the hub of the flier.

Similar letters of reference designate corresponding parts in all the figures.

Referring first to Fig. 1, A designates a spindle, which differs from those usually employed only in that it is provided near the tip with an annular groove, *a*. The flier B is made of a single piece of wire, coiled to form a hub, *b*, and bent to form the upper and lower arms, *c d*, each of which has an eye, *e*. The coils of the hub *b* fit loosely upon the spindle-tip, and one coil (in this instance the top one, *b'*) is slightly contracted, so that it enters the groove *a*. The coil *b'* holds the flier upon the spindle and prevents it from coming off accidentally, although it will give or expand sufficiently to enable the flier to be removed by a slight pull. This flier is composed entirely of a single piece of wire, and no additional hub is required, as is the case in the fliers commonly employed.

In Figs. 2 and 3, A designates the tip of the spindle, which has the annular groove *a*, and B' designates the hub of the flier, which is made of a piece of tubing and fits loosely on the spindle. The wire arms of the flier may be attached to the hub in any suitable manner. The hub B' is held upon the spindle A by a pin, *f*, inserted transversely through the hub, near one side, and entering the groove *a*, which enables the flier to work freely on the spindle, and when the flier is to be removed the pin *f* must be knocked out.

Referring now to Figs. 4 and 5, C designates a bobbin-top or doubler-weight, and C' designates the pin on which the flier is placed, which may be considered as a fixed spindle, and which has an annular groove, *a*, near its tip. The hub *b* of the flier B is composed of coiled wire, one coil, *b'*, of which enters the groove *a*, and the arms *c d* are provided with eyes *e*. The eyes *e* in this example of our invention are made separate from the arms, and are detachably affixed thereto, so as to enable the eyes to be readily replaced when worn out. The arms *c d* are coiled at *c' d'*, so as to form two sockets, and the wires extending from the eyes are inserted into the sockets, and are retained by the coils clamping or hugging upon them.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination, with a spindle provided with an annular groove, of a flier the hub of which is provided with a fastening device entering said groove, and providing for the turn-

ing of the flier on the spindle, while confining it longitudinally thereon, substantially as herein described.

2. The combination, with a spindle provided with an annular groove, of a flier having a hub composed of coiled wire fitting loosely upon the spindle, one coil of which is contracted, so as to enter said groove, substantially as and for the purpose specified.

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