

(No Model.)

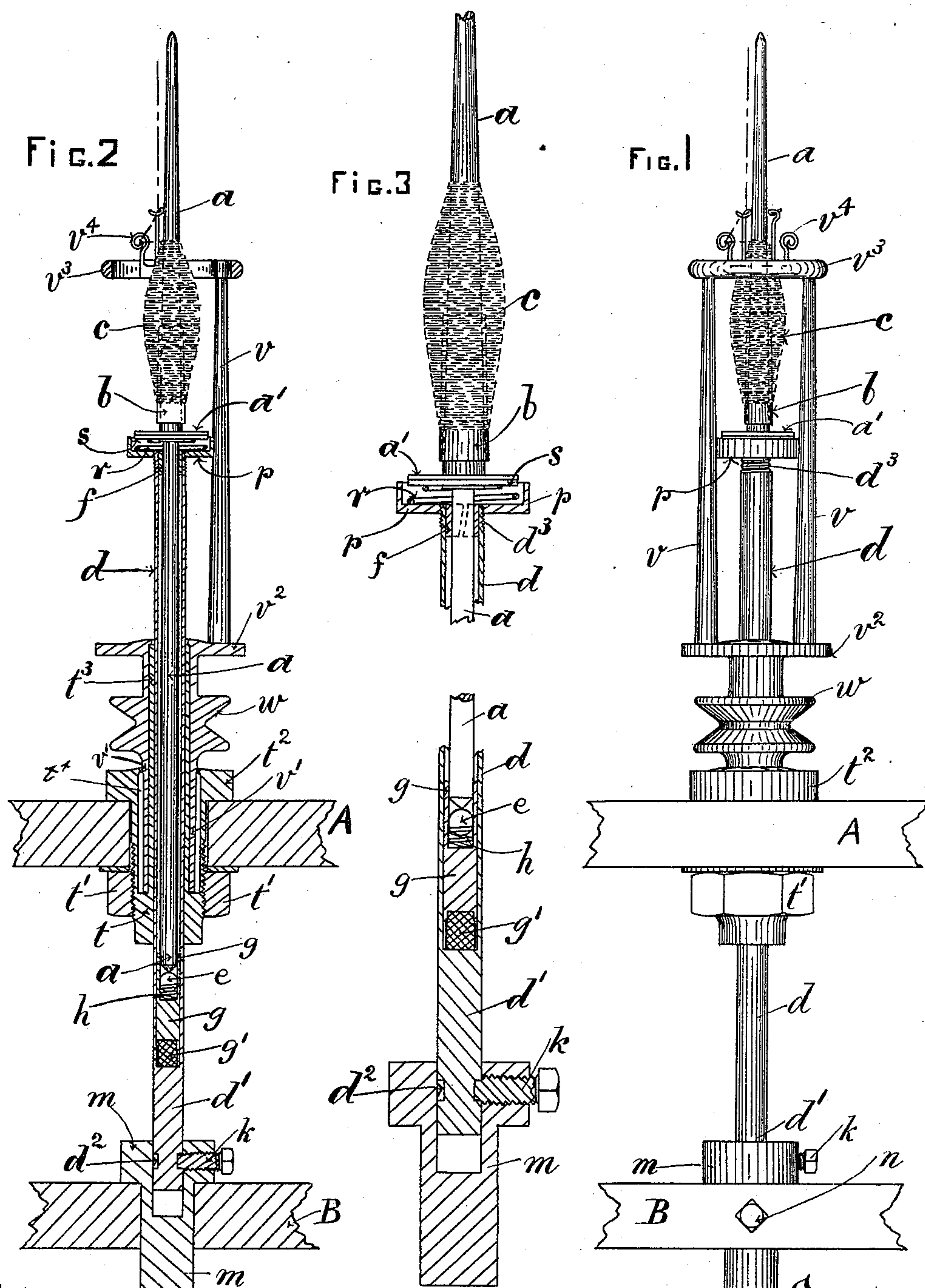
2 Sheets—Sheet 1.

J. HARGREAVES.

SPINDLE AND SUPPORT FOR SPINNING AND DOUBLING MACHINES.

No. 519,532.

Patented May 8, 1894.



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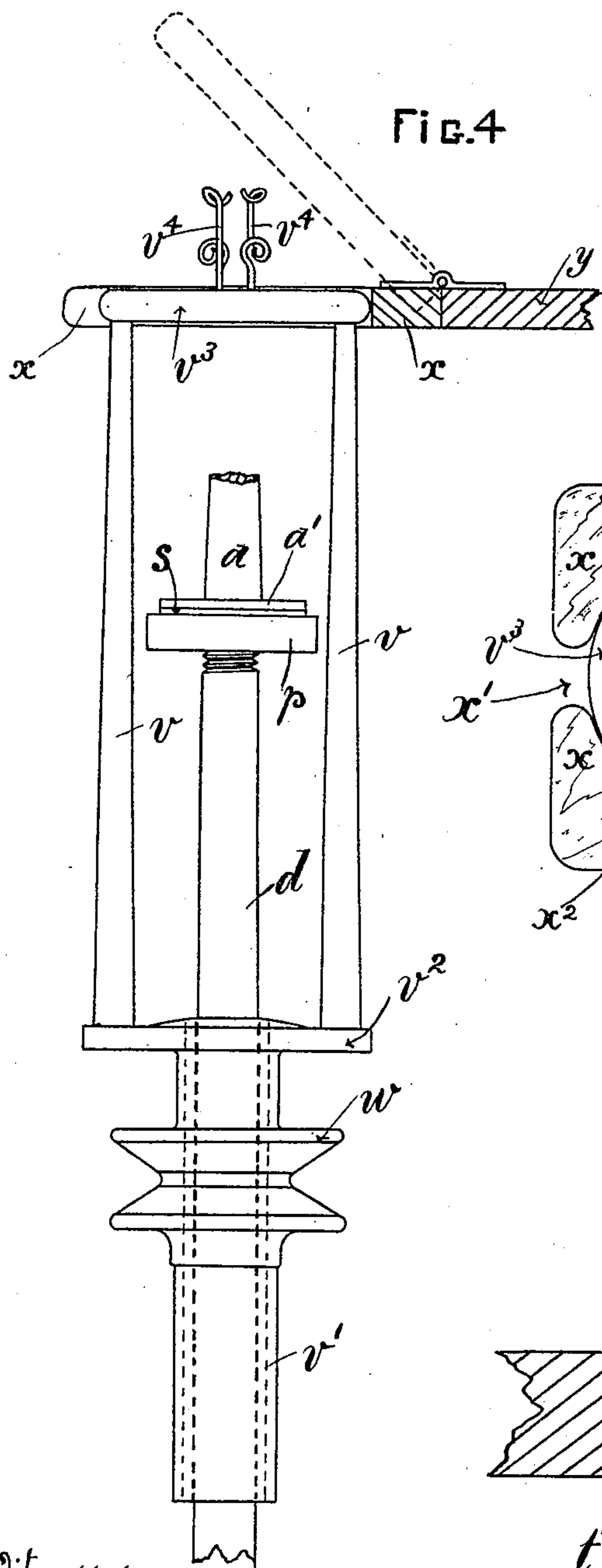


FIG. 7



FIG. 5

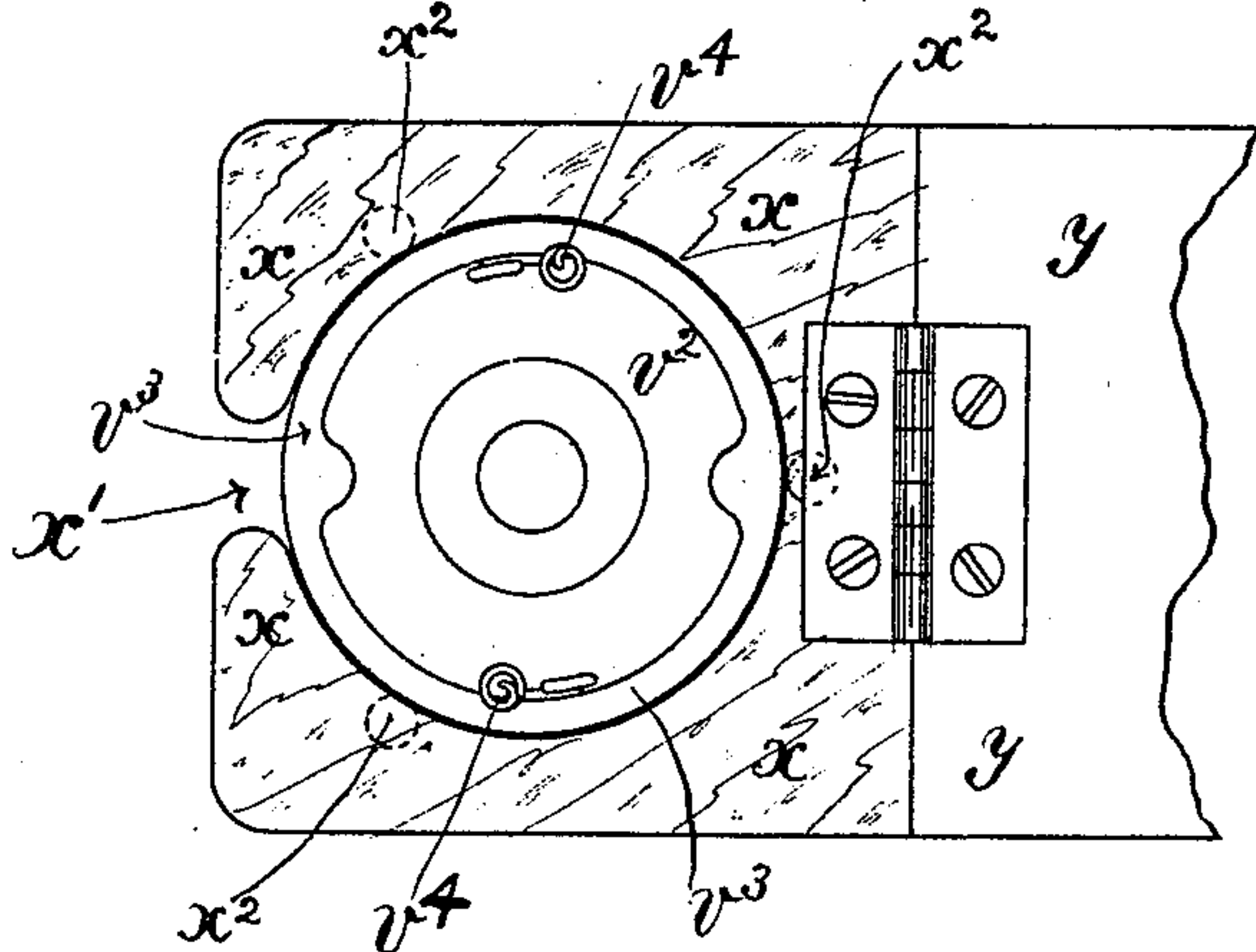
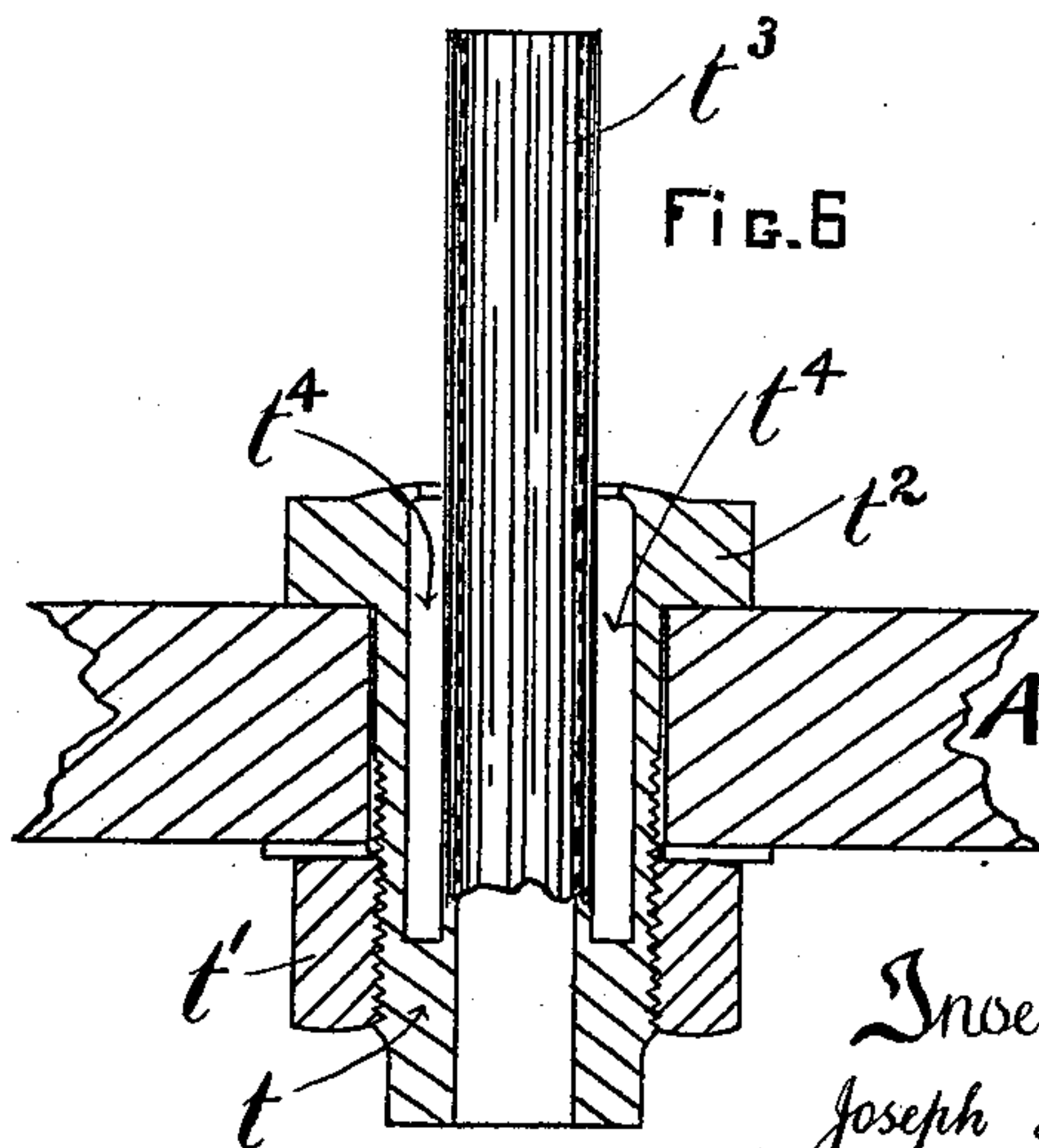


FIG. 6



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# UNITED STATES PATENT OFFICE.

JOSEPH HARGREAVES, OF BOLTON, ENGLAND.

SPINDLE AND SUPPORT FOR SPINNING AND DOUBLING MACHINES.

SPECIFICATION forming part of Letters Patent No. 519,532, dated May 8, 1894.

Application filed August 11, 1893. Serial No. 482,875. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH HARGREAVES, a subject of the Queen of Great Britain, residing at 303 Halliwell Road, Bolton, in the county of Lancaster, England, have invented a new and useful Spindle and Support for Spinning and Doubling Machines, of which the following is a specification.

My invention relates to improvements in spindles and supports therefor the same being for use in connection with machines for spinning and doubling yarns or fibrous threads, and the object of my invention is to provide means whereby the forming of cops or the spinning of the threads may be effected upon the bare spindles or upon small tubes of paper or other material placed thereon, while facilities are afforded for regulating the drag on the yarn, doffing or detaching the cops from their spindles and restarting said spindles. I attain this object by the formation, combination and arrangement of the several parts illustrated in the accompanying sheets of drawings, in which—

Figure 1 is a front elevation of the spindle and its support together with the other parts operating in connection therewith, only such of the framework of the machine being shown as is necessary to illustrate the application of this invention. Fig. 2 is sectional elevation of parts shown by Fig. 1. Fig. 3 is a sectional elevation showing the upper and lower parts of Fig. 2 on an enlarged scale. Figs. 4 and 5 are respectively side elevation and top view illustrating certain parts in detail same scale as Fig. 3. Fig. 6 is sectional elevation (same scale as Fig. 3) of the support through which the spindle passes and upon which the part shown by Figs. 4 and 5, revolves. Fig. 7 illustrates a spring used in connection with the spindle as is hereinafter described.

Similar letters of reference indicate similar parts throughout the several views.

The parts A and B are intended to illustrate the fixed and movable (or lifter) rails respectively, of any ordinary class of spinning or doubling machine at present in use, no other part or parts of such machine being shown since this invention may be applied to several of the classes with equal advantages as will readily be understood from the following description.

The spindle *a* upon which, or partly upon which and partly upon the small paper tube *b*, the yarn is wound to form the cop *c*, has the flange *a'* fixed thereon and is made to fit loosely within the tube *d* in order to revolve therein, its lower end resting upon the anti-friction ball *e* which may be of any suitable material as hardened steel, glass or the like, while the small neck-part or hoop *f* attached to the inner side of the upper end of the said tube *d* together with the bush *g* placed within and at the bottom of said tube *d* act as guides or bearings for said spindle *a* and have ample space for the lubricant. The ball *e* rests upon a small spring *h* supported by the solid part of the bush *g* while at the other end of this bush *g* a piece of suitable material or substance *g'* as cork or the like is inserted so as to intervene between this bush *g* and the solid part *d'* of the tube *d* by which means the spindle *a* is supported by bearings which allow most appropriate and desirable resilience for the purpose hereinafter described. The solid part *d'* of the tube *d* has a concentric groove or furrow *d<sup>2</sup>* made therein for the reception of the point of the screw *k* when said tube *d* is mounted in its footstep *m*, this method of mounting the tube *d* being to secure the same rigidly so far as regards its vertical movements, while it has suitable play allowed it in a lateral direction in order to meet any slight irregularities that may arise in the alignment of the footstep *m* with the supports mounted on the rail A through which the tube *d* passes and operates as it rises and falls with the rail B in its well known path of motion and for well known purposes. The footstep *m* is fixed to the rail B by the screw *n* so that at all times it moves as and when this said rail B moves.

On the outer end of the tube *d* a screw or thread *d<sup>3</sup>* is formed so that the hollow disk *p* may be screwed and mounted thereon. This hollow-disk *p* acts as a support or receptacle for the spring *r* and an annular piece of cork or leather or other substance *s* which intervenes between the spring *r* and the flange *a'*.

The double-bush *t* is fixed to the rail A by its sleeve extending through the same to have the nut *t'* screwed thereon while its collar or shouldered part *t<sup>2</sup>* holds it in the other direction. This double-bush *t* is formed so that



the sleeve  $v'$  of the flier  $v$  may take over the inner part  $t^3$  and enter the socket  $t^4$  formed in the outer part by which means substantial support is afforded to this flier  $v$ , and the socket  $t^4$  forms an appropriate receptacle for the lubricant. The wharve or grooved driving pulley  $w$  is fixed upon the sleeve  $v'$  as is also the disk  $v^2$  which together with the pillars  $v$  and the annular piece  $v^3$  upon which are mounted the curled thread guides  $v^4$  form the flier. The guide piece  $x$ , which is hinged to the rail or bar  $y$  extending lengthwise the machine, when in its position shown in full lines Fig. 4, prevents excessive vibration of the flier  $v$  during its rapid rotation and to prevent undue friction hardened steel or glass projecting pieces  $x^2$  are made to extend beyond the inner surface of this piece  $x$  for the annular piece  $v^3$  alone to come in contact with them, while by this piece  $x$  having the opening  $x'$  made therein it may be raised into the position shown by broken lines Fig. 4 thus allowing the cops to be freely detached from their spindles, which are thus rearranged for restarting. As the flier  $v$  revolves (by reason of its wharve  $w$  being operated by the well known driving cord or band) so as to wind the yarn or thread upon the spindle  $a$  (or partly upon said spindle  $a$  and partly on the tube  $b$ ) the difference between the space traveled by said flier and the length of yarn delivered for it to wind upon the spindle  $a$  is allowed for by the said spindle  $a$  slipping upon its bearing tube  $d$  and revolving against the retarding action of its disk  $a'$  which bears upon the frictional washer  $s$  such retarding action or power increasing as the cop  $c$  increases in size and weight by reason of said weight causing the spindle  $a$  to depress the spring  $h$  and thereby allow the disk  $a'$  to press with an increased force upon the washer  $s$  supported by the spring  $r$ . Thus the regulations necessary to meet the conditions in the winding of the yarn upon the spindle  $a$  from the time when said spindle is thereby covered by it, until it has increased thereon to assume considerable proportions or the necessary diameter, are automatically effected. The spring  $r$  is not strong enough to

support the spindle  $a$  at any time, hence by the disk  $p$  being turned upon the screw thread  $d^3$  in order to raise the said spring  $r$  to increase its pressure against the disk  $a$  or to lower it to decrease such pressure, the retarding action on said spindle  $a$  may be adjusted to suit the winding thereon of any of the well known kinds of yarn to produce any of the varied sizes of cops as may be desired.

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

1. The combination of a spinning machine spindle having a friction disk secured thereto, a friction washer operating in connection with said disk, a resilient support for said washer, and a yielding bearing for said spindle, all as and for the purposes set forth.

2. The combination of a spinning machine spindle having a friction disk attached thereto, a bearing tube formed to receive said spindle, resilient supports mounted within said tube to allow said spindle to descend as its weight is increased by the winding thereon of the yarn, an adjustable disk mounted on said tube, and a spring and friction washer operating in connection with the disk on said spindle substantially as herein set forth.

3. The combination of a spinning machine spindle having a friction disk fixed upon it, a bearing tube formed to receive said spindle, and to receive the end of a screw for attaching to its foot-step, the drag device between the bearing tube and said friction disk a foot-step into which said tube is made to fit a screw for attaching said bearing tube to said foot-step, a sleeve forming the flier to fit over and into bearings forming its support, on said sleeve being also formed the wharve or grooved driving pulley bearings attached to a fixed rail for supporting said flier and a hinged guide piece for steadying the outer end of said flier substantially as specified.

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