A. SEELEY & H. HOLT.

SPINDLE.

APPLICATION FILED JULY 1, 1910.

996,530.

Patented June 27, 1911.

3 SHEETS—SHEET 1.

FIG 1.

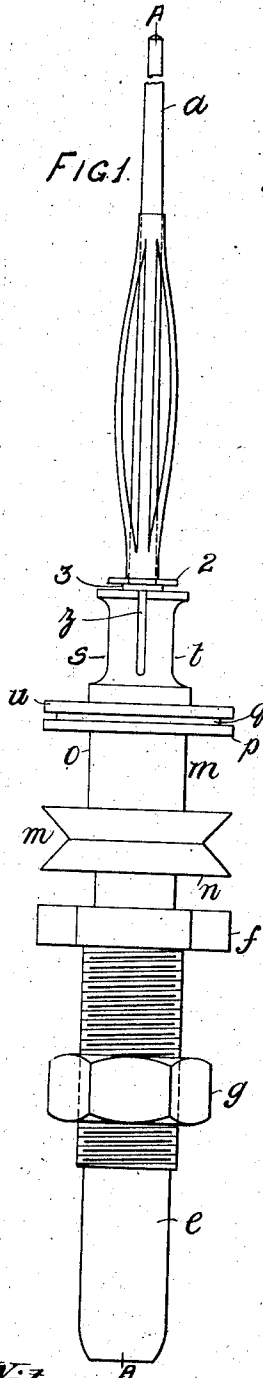


FIG 2

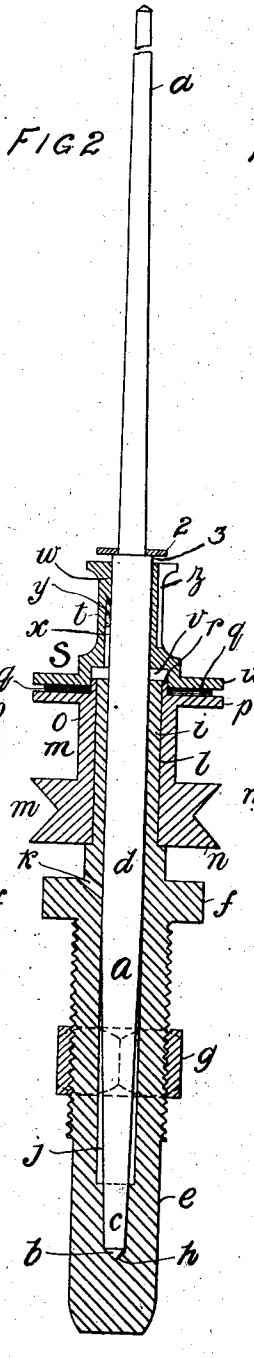


FIG 3.

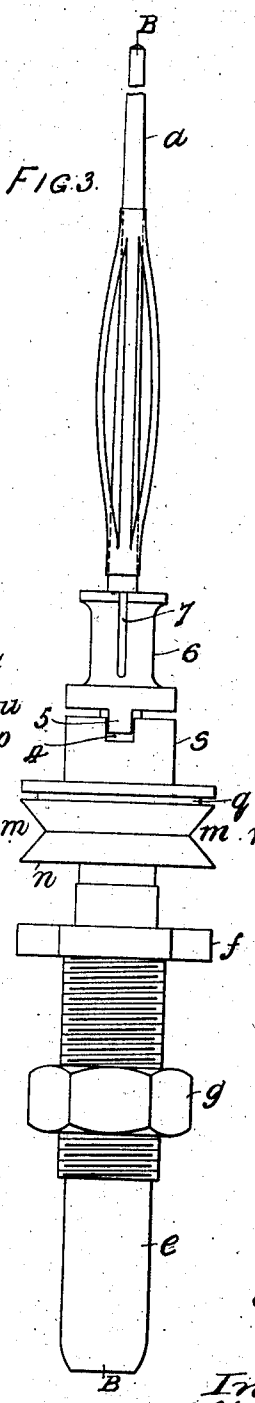
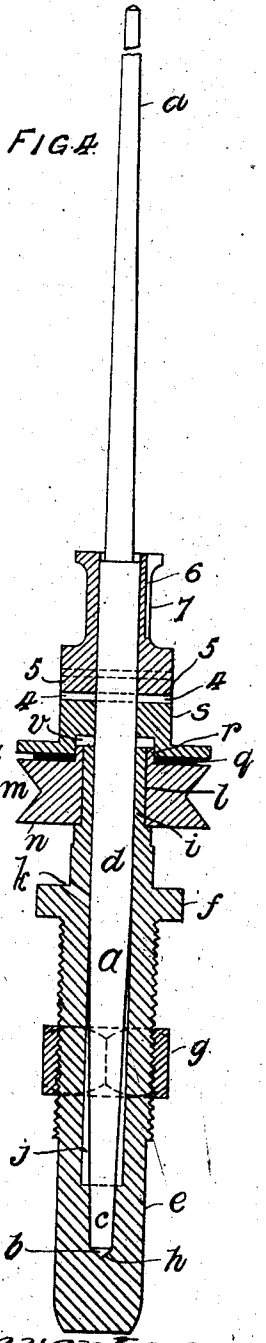


FIG 4.



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3 SHEETS—SHEET 2.

FIG. 5.

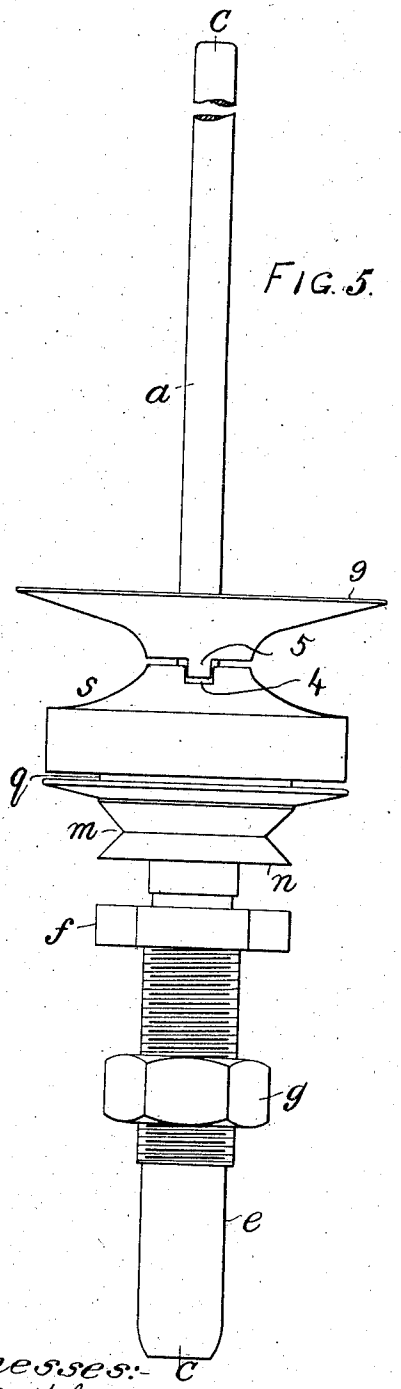
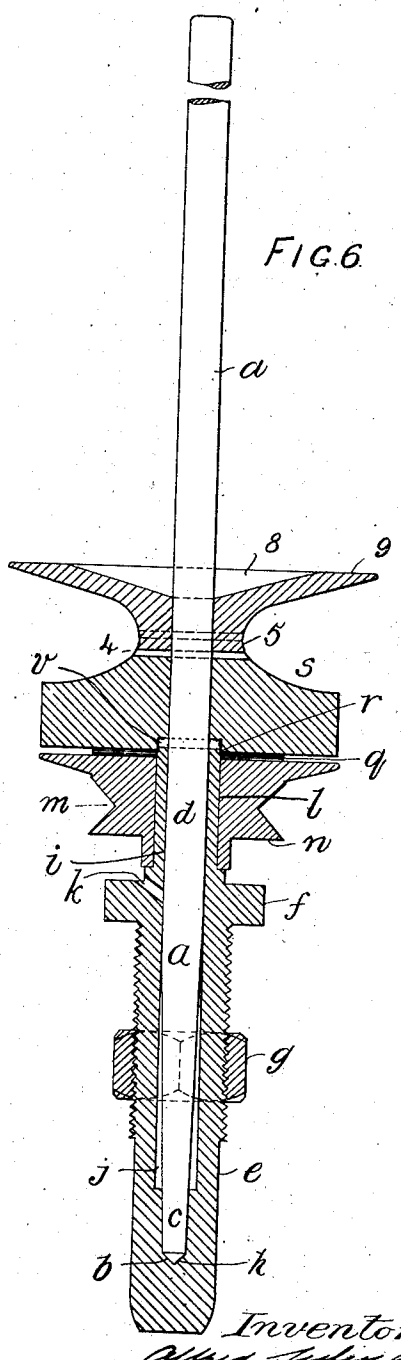


FIG. 6.



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3 SHEETS—SHEET 3.

FIG. 7.

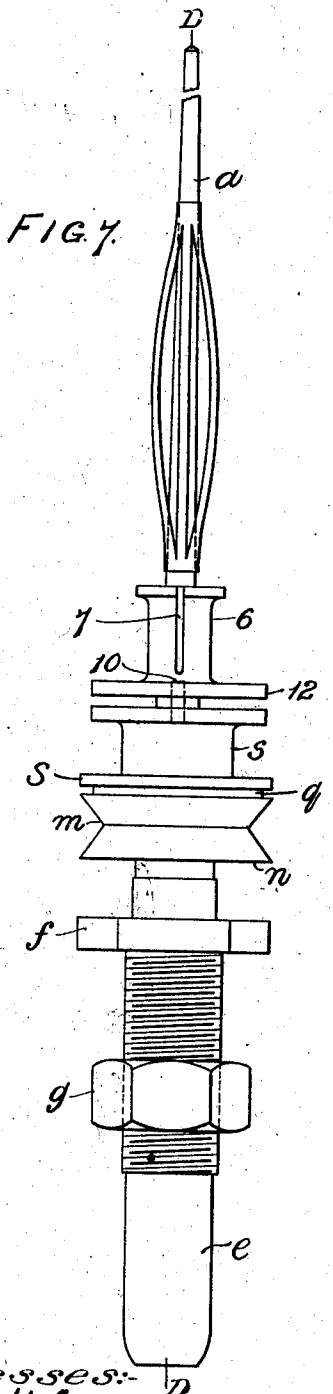
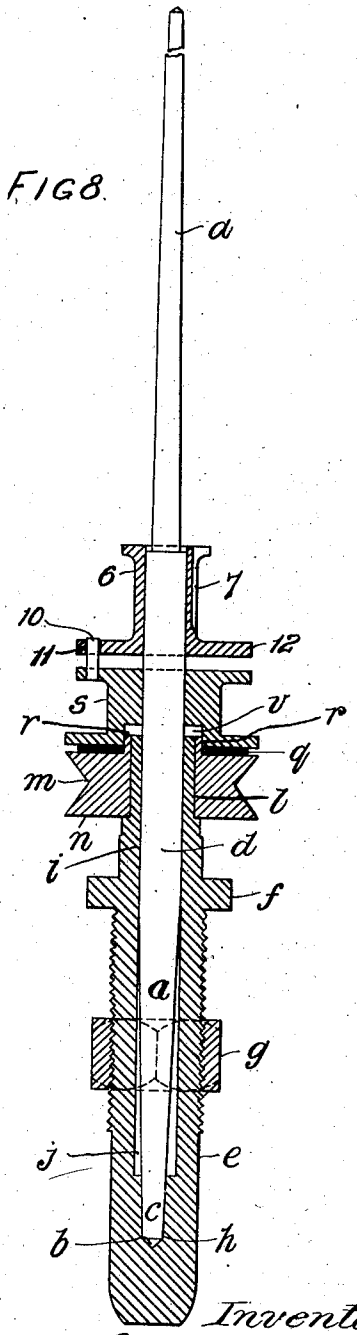


FIG 8.



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UNITED STATES PATENT OFFICE.

ALFRED SEELEY AND HERBERT HOLT, OF ROCHDALE, ENGLAND.

SPINDLE.

996,530. Specification of Letters Patent. Patented June 27, 1911.

Application filed July 1, 1910. Serial No. 569,980.

To all whom it may concern:

Be it known that we, ALFRED SEELEY, machine-maker, a subject of the King of the United Kingdom of Great Britain and Ireland, and resident of 54 Syke road, Rochdale, in the county of Lancaster, England, and HERBERT HOLT, machine-maker, a subject of the King of the United Kingdom of Great Britain and Ireland, and resident of Shaw Hill, Cronkeyshaw, Rochdale, in the county of Lancaster, England, have invented new and useful Improvements in Spindles, of which the following is a specification.

This invention relates principally to spindles for use in any case in which the bobbin or tube or other object mounted on a spindle in order that yarn or thread may be wound upon it by the revolution of the spindle is required at times to lag behind or to revolve more slowly than the wharve or pulley or other part transmitting motion to it so that the yarn or thread delivered to the spindle at any moment may determine the speed of the bobbin, tube or other object in accordance with the differences in diameter at different parts of such bobbin, tube or other object or the yarn or thread wound thereon and the principal object of this invention is to provide for use in any such case as aforesaid spindles which with bobbins or paper tubes or other bodies mounted on them to receive yarns or threads, can be turned more easily relatively to or more easily held against turning with the parts such as wharves or pulleys by which they are driven than any spindles heretofore provided for like purposes and thus to enable spindles used in any such case as hereinbefore described to be used in winding yarns or threads more delicate than it has been possible heretofore to wind in such a way at any speed whatever or to be used in winding yarns or threads at speeds greater than have been possible heretofore in such a way of winding.

Although especially applicable to spindles for use in winding machines in which yarns or threads are to be wound into the form of cops or the like, the improvements constituting this invention are applicable also to spindles of other kinds as for example spindles for ring spinning machines or ring doubling machines in which yarns or threads are liable to breakage by excessive strain before the travelers can be set in motion in the starting of such machines or after the "piecing" of "broken ends."

According to this invention there is provided in a spindle for any such use as aforesaid a carrying part to receive and to carry the yarns or thread in any way requisite as upon paper tubes, bobbins or the like which is mounted to revolve in a footstep and any other bearing requisite or desirable, a driving part of any kind such as a wharve, pulley and the like as may be appropriate to the purpose for which the spindle may be intended, which is mounted to revolve upon a bearing always out of contact with and so without exerting influence upon the carrying part aforesaid and is made to bear a frictional pad of any kind such as a washer of flannel and the like and a friction transmitting part which is made to rest upon the driving part and is engaged with the carrying part so as to be able to turn it while remaining free to move in the direction of the axis of such carrying part for such a distance that in no circumstances of use such as by the use of friction pads varying in thickness or by the weight of yarn or thread and tubes, bobbins and the like carrying it can the transmitting part be made to bear any part of the weight of the carrying part and yarn or thread thereon, whereby on the one hand disturbance of the carrying part from its proper support and capacity for easy revolution and on the other hand variation in the friction available for driving other than that due to normal wear of the frictional pads and the surfaces in contact with them are wholly obviated.

In the accompanying drawings are represented by way of illustration and examples four forms of spindle made according to this invention those shown having carrying parts formed as spindle-blades, the spindle-blade being in each case shown as broken in order to allow of the adoption of a scale large enough clearly to show the construction in the space available. The spindles represented are shown in so far as is requisite to enable this invention to be understood and carried into practice.

Figure 1 is a side elevation of a spindle of one form, Fig. 2 is a vertical section taken on the plane indicated by the line A A of Fig. 1 but for clearness showing the spindle-blade in side elevation without an elastic sleeve shown in Fig. 1 merely to make clear

how paper tubes may be applied. Fig. 3 is a side elevation of a spindle of a second form. Fig. 4 is a vertical section taken on the plane indicated by the line B B of Fig. 3 but for clearness showing the spindle-blade in side elevation and without an elastic sleeve shown in Fig. 3. Fig. 5 is a side elevation of a third form of spindle. Fig. 6 is a vertical section taken on the plane indicated by the line C C of Fig. 5 but for clearness showing the spindle-blade in side elevation. Fig. 7 is a side elevation showing a fourth form of spindle. Fig. 8 is a vertical section taken on the plane indicated by the line D D of Fig. 7 but for clearness showing the spindle-blade in side elevation.

The same letters of reference are employed to indicate like parts in all the figures.

In the spindle illustrated in Figs. 1 and 2 the carrying part *a* formed as a spindle-blade *a* is shown as furnished with a conical foot *b* and adjacent taper portion *c* to fit a footstep at the lower end and a cylindrical part *d* to form an upper journal and is shown as mounted in a bolster *e*. The bolster *e* is shown as adapted to be mounted in a rail being furnished with a flange *f* to rest upon the rail and with screw-threads to receive a nut *g* by which it may be secured in position. The bolster *e* is further shown as having in its interior the footstep *h* and a cylindrical bearing *i* in the upper part with an intervening wider portion or cavity *j* serving as a holder for some reserve of lubricant, *k* being a hole through which lubricant may be supplied. The bolster *e* is also shown as having on its exterior at the upper part a journal *l* to receive and support and to keep always apart from the spindle blade *n* the driving part *m* shown as a wharve or pulley *n* with a sleeve *o* adapted by the provision of a flange *p* to receive a washer *q* of yielding frictional material such as flannel and in the case represented a central collar *r* is also formed around the central hole of the driving part *m* to prevent the washer *q* from moving eccentrically and passing into contact with the spindle-blade *a*. A flange or collar *s* to bear upon the washer *q* is shown as provided to transmit motion from the driving part *m* to the spindle-blade *a*. The friction-transmitting device shown as a collar *s* is shown as provided with a boss *t* having at the lower part a flange *u* of diameter equal to that of the flange *p* and in the case represented also with a central cavity *v* to receive the upper edge of the collar *r* and thereby to guard against the washer *q* being caught between the flange *u* and the spindle-blade *a* at the upper end of the bolster *e*. The collar *s* is formed internally with a hole *w* of a diameter allowing it to be moved freely up or down and coaxially with a cylindrical part *d* of the spindle-blade *a*, so as never to bear any part of the weight of the spindle-blade or yarn or thread thereon and so never to be pressed thereby toward the driving part *m*. A groove *x* to receive a key *y* secured in the spindle-blade *a* is formed in the collar in order that the collar *s* and spindle-blade *a* cannot be turned independently of one another. The collar *s* serves by its weight to press the flange *u* against the washer *q* and the washer *q* against the flange *p*. The central boss *t* of the collar or flange *s* may serve to receive a few coils of yarn or thread after the completion of one cop or bobbin so as to hold the yarn or thread in readiness to be wound at the commencement of the next cop or bobbin in the manner usual in ring-spinning machines and a groove *z* formed in the boss *s* may enable the coils of yarn accumulating thereon in use to be cut away or pulled off easily from time to time. The spindle-blade *a* is shown reduced in diameter and tapering upward above the cylindrical part on which the collar or flange *s* is mounted and is shown in Fig. 1 as furnished with spring packing in the form of an elastic sleeve on which a paper or like tube on which yarn or thread is to be wound may be placed so as to be held firmly in position upon the spindle-blade *a*. Any means desirable for preventing the spindle-blade *a* and collar or flange *s* from being accidentally displaced or removed from the bolster *e* in use may be used.

There may be provided if desirable in any case any convenient means of preventing paper tubes and other bodies to receive yarn or thread from being pushed so far down the spindle-blade *a* as to bear upon the friction-transmitting-device *s*, a collar 2 applied to the spindle-blade *a* against a shoulder 3 thereon being one such means. In the spindle the driving part *m* comprising a wharve or pulley is formed so that the washer *q* may bear upon it and the bolster *e* is shorter than that represented in Figs. 1 and 2 to an extent corresponding to the shortening of the driving part *m*. The collar *s* used in the spindle represented in Figs. 3 and 4 is made to fit upon the carrying part formed as the spindle-blade *a* so as easily to be moved lengthwise thereof and coaxially therewith and to surround the upper edge of the collar *r* upon the driving part *m*, and is provided in its upper end with notches 4 to receive keys 5 formed on and projecting from a collar 6 fast upon a spindle-blade *a* and serving to transmit motion from the collar *s* to the spindle-blade *a* and if desirable to receive coils of yarn at the completion of cops or the like. The collar 6 is fixed in such a position and the notches 4 and keys 5 are formed of such relative dimensions that the collar *s* can in use never bear any part of the weight of the spindle-blade *a* or yarn or thread thereon. The collar 6 is formed with a groove 7 serving

the same purpose as the groove *z*. In other respects the spindle represented in Figs. 3 and 4 is similar to that represented in Figs. 1 and 2.

The spindle represented in Figs. 5 and 6 is similar in construction to that represented in Figs. 3 and 4 except in that the driving part *m*, the flange or collar *s* and the collar 6 are of larger diameter, in that the collar 6 is provided with a concave upper surface 8 with a circumferential flat surface 9 to support a bobbin, in that the spindle-blade *a* is cylindrical from its upper bearing to the upper end. The spindle represented in Figs. 5 and 6 is intended for use in winding yarn or thread upon large flanged bobbins such as are used to hold yarn or thread for use in forming warps and in the use of the spindle it will ordinarily be convenient, as is customary in the winding of yarn or thread on to similar bobbins placed upon spindles, that a washer of felt or the like should be placed on and made to adhere to the surface 9.

In the spindle illustrated in Figs. 7 and 8 is provided a friction-transmitting-device *s* formed as a collar with a pin 10 engaged with a hole 11 in a flange 12 formed around a collar 6 fast upon the spindle-blade *a* in such a position above the friction-transmitting-device as never to rest thereon, the pin 10 being free to move up and down in the hole 11 while able to transmit motion to the collar 6 and spindle-blade *a*.

In each of the spindles represented in the accompanying drawings, the driving part *m* is clearly shown as being carried by the bolster *e* so as never to be able to pass into contact with the spindle-blade *a* and the friction-transmitting-device *s* which receives motion through the washer *q* from the driving part *m* being free to move lengthwise of the spindle-blade *a* is free to be raised to any extent requisite from the driving part *m* by the washer *q* according as a thicker or thinner washer *q* may be in use from time to time without affecting the proper bearing of the lower end *b* of the spindle blade *a* in the footstep *h* or allowing the weight of the spindle-blade or yarn thereon to modify the friction available for the transmission of motion. Consequently the friction between the driving part *m* and the washer *q* and between the washer *q* and the collar *s* forms the only means for transmitting motion from the driving part *m* to the spindle-blade *a* and the weight and friction of the collar *s* against the washer *q* are not affected by the weight of yarn or thread wound upon a tube or bobbin or other body applied to the spindle-blade *a*. At all stages therefore of the winding the yarn or thread being wound may without being thereby strained or broken hold back the spindle-blade *a* against revolving with the driving part *m* either so as only to allow the spindle-blade *a* to revolve at a speed corresponding to that at which yarn or thread is allowed to pass to it or in the case of a yarn or thread requiring to be "pieced" after breakage or the termination of the yarn or thread to hold the spindle-blade *a* against revolution or to allow it to be turned backward by the yarn or thread being pulled off the body of yarn or thread upon it.

The bolster *e* may be formed so as in any case to extend for any desirable distance into the friction-transmitting-device. In each of the cases represented the bolster *e* extends approximately to the upper edge of the collar *r* and to that extent into the friction-transmitting device *s*, but in cases in which the collar *r* and cavity *v* are provided and also in cases in which they are dispensed with the bolster *e* may extend for any desired distance toward, into or throughout the friction-transmitting-device and if extending therein may whenever this may be desirable also serve as a journal therefor.

By this invention it will be seen that variation in the thickness of frictional driving pads and variation in the weight applied to the carrying parts of spindles by the yarn or thread and any other bodies carried thereon are prevented from causing variation in the pressure applied to bring about the transmission of motion from the driving parts to the carrying parts and also insures that the carrying parts of the spindles shall always be able to bear properly in their footsteps and any other bearings used and thus enables just the friction suitable in each case to be provided and enables the carrying parts of the spindles to be driven easily and also when requisite also to be held back by the tension of yarn or thread against revolution and if need be to be turned back by yarn or thread being pulled off without risk of yarns or threads even of the most delicate character intended to be wound in any particular case being strained or broken.

Obviously the details of spindles constructed according to this invention may be varied in different cases as may be requisite without departure from the principles of this invention as set forth herein and in the claims following.

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

1. In a spindle, a bolster having a footstep, an inner and an outer bearing, a carrying part arranged to revolve within the bolster, a driving part revolubly supported on the outer bearing, a frictional pad carried on the driving part and a friction transmitting device in driving connection with the said carrying part, and movable in the direction of the length thereof and bearing on the frictional pad.

2. In a spindle, a bolster having a footstep, an inner and an outer bearing, a carrying part arranged to revolve within the bolster, a driving part revolubly supported on the outer bearing and provided with a central projection, a frictional pad resting on the said driving part around the central projection and a friction transmitting device in driving connection with the carrying part and movable in the direction of the length thereof and bearing on the frictional pad.

3. In a spindle, a bolster having a footstep, an inner and an outer bearing, a carrying part arranged to revolve within the bolster, a driving part revolubly supported on the outer bearing and having a central projection, a frictional pad resting upon the said driving part around the central projection and a friction transmitting device in driving connection with the carrying part and movable in the direction of the length thereof and having a central recess to receive the central projection on the driving part, said friction transmitting device bearing on the frictional pad.

In testimony, that we claim the foregoing as our invention, we have signed our names in presence of two witnesses, this tenth day of June 1910.

ALFRED SEELEY.
HERBERT HOLT.

Witnesses:
HOWARD CHEETHAM,
RUTH MAGDALENE WILSON.