H. HOLT AND A. SEELEY.

SPINDLE OR HOLDER FOR CONES FOR WINDING MACHINES.

APPLICATION FILED OCT. 8, 1915.

1,306,256.

Patented June 10, 1919.

3 SHEETS—SHEET 1.

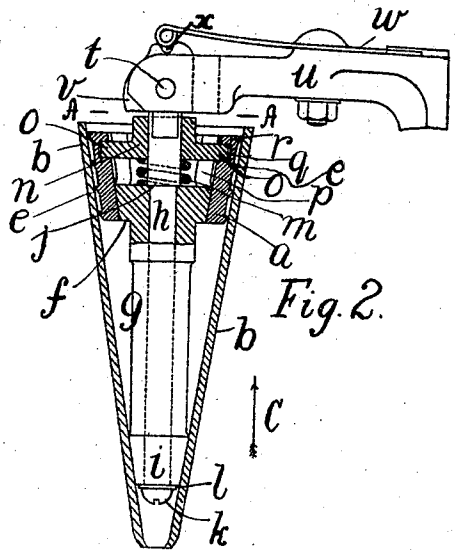


Fig. 2.

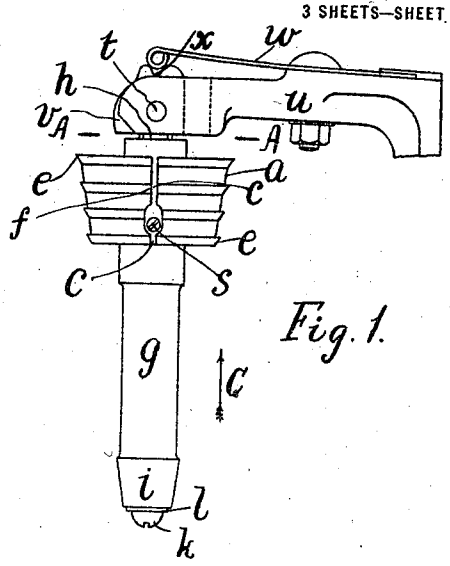
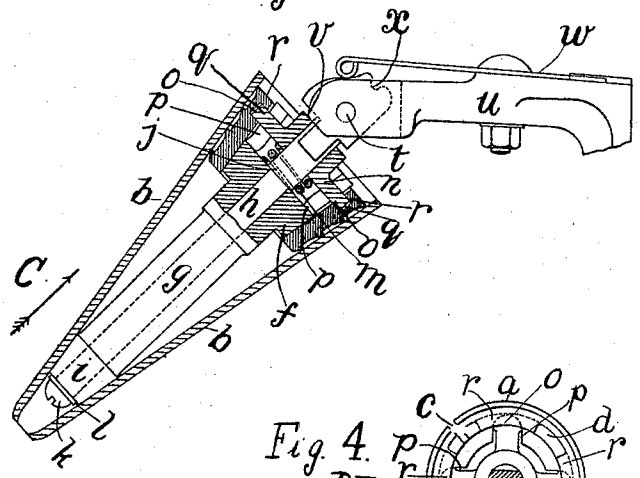


Fig. 1.

Fig. 3.



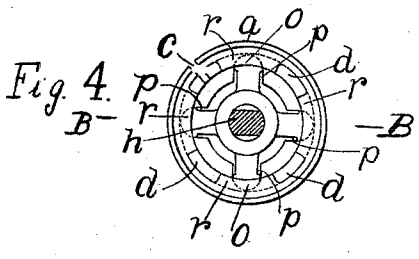


Fig. 4.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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3 SHEETS—SHEET 2.

Fig. 5.

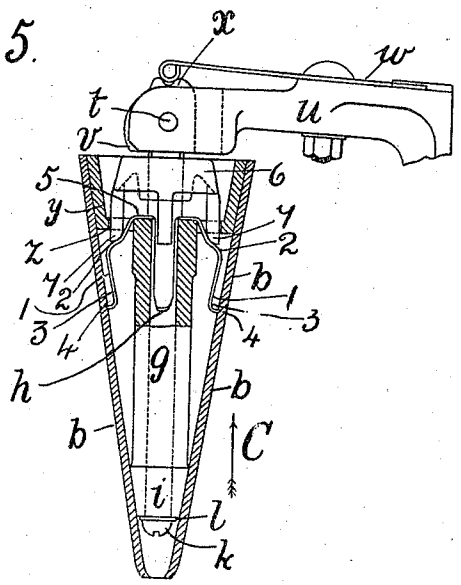
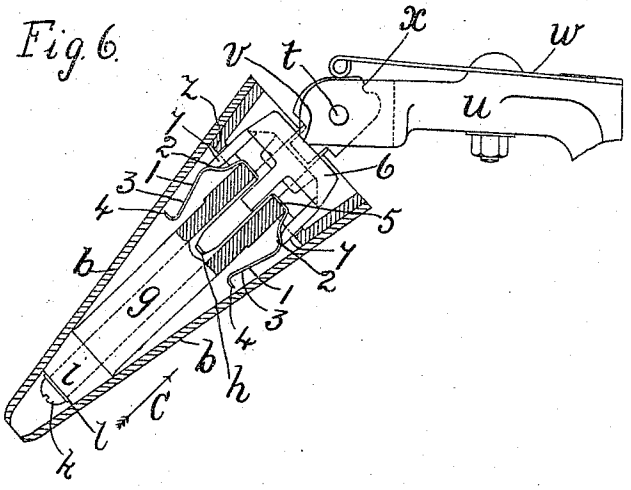


Fig. 6.



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3 SHEETS—SHEET 3.

Fig. 7.

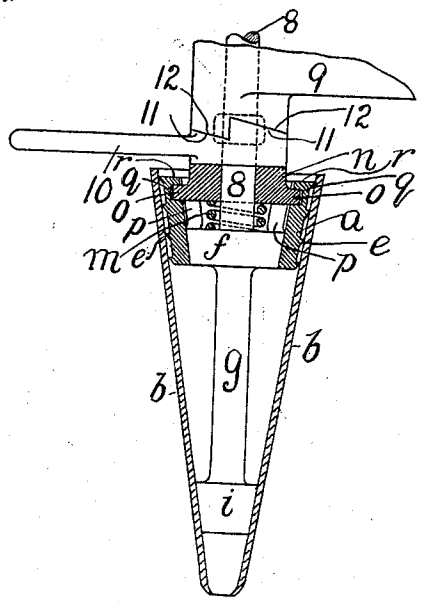


Fig. 8.

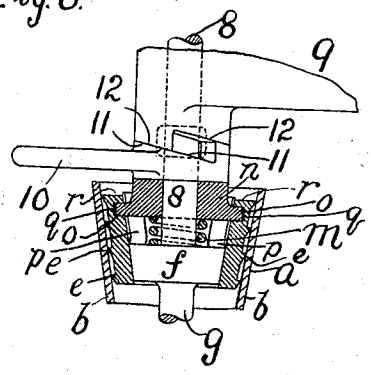
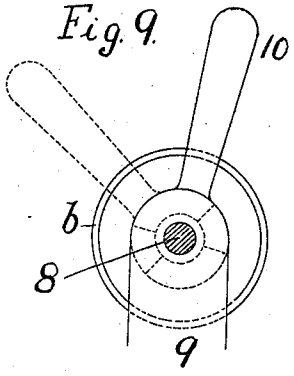


Fig. 9.



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UNITED STATES PATENT OFFICE.

HERBERT HOLT AND ALFRED SEELEY, OF ROCHDALE, ENGLAND.

SPINDLE OR HOLDER FOR CONES FOR WINDING-MACHINES.

1,306,256. Specification of Letters Patent. Patented June 10, 1919.

Application filed October 8, 1915. Serial No. 54,810.

To all whom it may concern:

Be it known that we, HERBERT HOLT, machine-maker, a subject of the King of the United Kingdom of Great Britain and Ireland, and resident of Shaw Hill, Cronkey Shaw, Rochdale, in the county of Lancaster, England, and ALFRED SEELEY, machine-maker, a subject of the King of the United Kingdom of Great Britain and Ireland, and resident of Melrose House, Bentmeadows, Rochdale, in the county of Lancaster, England, have invented new and useful Improvements in Spindles or Holders for Cones for Winding-Machines, of which the following is a specification.

This invention of improvements in spindles or holders for the purpose of holding paper or other cones for machinery for winding yarn, thread, cord, twine or the like relates to the spindles or holders hereinafter for convenience called holders which are provided with expansible and contractible teeth or projections for engaging with the interior surfaces of paper or other like cones placed upon them in order to receive yarn, thread, cord, twine and the like to be wound in winding machines whether the winding is effected by the holders being mounted on or formed as parts of revolving spindles, mandrels or the like or by the surfaces of paper or other cones on the holders or yarn, thread, cord, twine or the like wound upon such cones being applied to the surfaces of revolving drums, rollers or belts or other revolving surfaces and whether the securing and release of paper or other cones applied to the holders are effected by the holders or mandrels, spindles or shafts on which they are formed or mounted being turned about ends or parts so that cam surfaces are brought into or put out of action to effect or allow movement of the engaging devices or by means of handles or levers or other devices provided for moving the engaging devices into or out of engagement with the paper or other cones.

This invention consists in holders for the said purpose and devices for use therein which are or render holders in which they are applied more efficient than the holders heretofore provided have been in holding paper or other cones firmly in position when placed thereon and continuing to hold them firmly even though by expansion or by deformation the paper or other cones in the parts engaged with the holding devices provided in or on the holders should move a little away from the axes of the holders after being applied thereto and which obviate the disadvantage common in some holders heretofore constructed that the parts provided to engage paper or other cones tend to push them axially off the holders in passing into or keeping in engagement with them.

According to this invention holders for the purpose aforesaid with engaging parts for engaging the paper or other cones to be applied to the holders are provided with resilient engaging means preventing engaging parts which in moving or being moved outward from the axes of the holders to engage or to keep in engagement with paper or other cones move also axially of the holders in the direction from the points or narrow ends to the bases or wider parts of the paper or other cones applied to the holders and thus the engaging parts are made to pull the paper or other cones more firmly on to the holders in passing or keeping in engagement with them.

In the accompanying drawings two forms of holders constructed according to this invention are shown by way of example and in illustration of this invention, Figures 1, 2, 3 and 4 showing one form and Figs. 5 and 6 the other, and Figs. 7, 8 and 9 showing a modification of the form illustrated in Figs. 1, 2, 3 and 4.

Fig. 1 is a view taken at right angles to the holder represented and showing such holder together with a part of the swing arm in which the shaft of the holder is carried and the spring employed to keep the holder in its ordinary position.

Fig. 2 which shows the holder in the same position as Fig. 1, and Fig. 3, which shows the holder in a different position, are partly sections taken through the axis of the holder and a cone applied thereto but showing the shaft of the holder and part of the sleeve and its appurtenances in external view and for the rest are views similar to Fig. 1.

Fig. 4 is principally a view of the rear or larger end of the holder and in part a section taken on the plane indicated by the

line A A of Figs. 1, 2 and 3. The line B B of Fig. 4 indicates the plane on which the sections in Figs. 2 and 3 are taken.

Figs. 5 and 6 which show the holder represented in them in different positions are partly sections taken through the axis of the holder and a cone applied thereto but showing the shaft of the holder and some parts thereof and appurtenances in external view at right angles to the axis of the holder and for the rest are views at right angles to the axis of the holder showing a part of the swing arm by which the shaft of the holder is carried and the spring employed to keep the holder in its ordinary position.

Fig. 7 is partly a section taken through the axis of the holder and a cone thereon but showing parts of the holder and part of its support and an operating handle in external view.

Fig. 8 is a view similar to the larger end of Fig. 7 but showing some of the parts in different position.

Fig. 9 is a view taken from the rear or larger end of Fig. 7 and partly in section.

The same letters and numerals of reference are employed to indicate corresponding parts in all the figures.

In the holder shown in Figs. 1, 2, 3 and 4 *a* is a tapered split collar provided as the means of engaging the paper or other cones *b* to be mounted on the holder, *c* is the nick or split in the collar *a* and *d* are grooves formed therein to render it more flexible and to enable it to be expanded and to contract with less departure from circular form than if it were of uniform thickness throughout its circumference.

The collar *a* is shaped so as to correspond in taper with the interior of the paper or other cones *b* and is provided outwardly with sharp ridges *e* shaped to incline toward the larger end of the collar *a*.

The tapered collar *a* is made to surround and is movable in the direction of the axis of a tapered part *f* formed on a sleeve *g* mounted to revolve around the shaft *h* on which the holder is made to revolve. The sleeve *g* is formed at one end with a tapered part *i* of a taper corresponding to the taper of the interior of the paper or other cone near the point or smallest part thereof and is held in position axially by means of a shoulder *j* on the shaft *h* and a screw *k* screwed therein. A washer *l* is interposed between the head of the screw *k* and the shaft *h*. In a space within the tapered part *f* of the sleeve *g* is placed a spring *m* made to bear at one end against the sleeve *g* and at the other end against a collar *n* which is capable of being turned around and moved axially upon the shaft *h* and is provided with arms *o* which are passed and made to project through notches *p* in the tapered part *f* of the sleeve *g* and made to engage the tapered collar *a* by being passed through the grooves *d* into grooves *q* formed in the parts *r* between the grooves *d* so that the parts *r* form lugs for engagement with the arms *o*.

A stud *s* is passed through a slot formed in the tapered collar *a* and is screwed into the tapered part *f* of the sleeve *g* in order to prevent the tapered collar *a* from being turned out of engagement with the arms *o* of the collar *n* while allowing the tapered collar *a* to be moved axially along the tapered part *f*. The tapered collar *a* when moved against the force of the spring *m* is moved toward the smaller end of the tapered part *f* of the sleeve *g* and contracts but when the spring *m* is allowed to move the collar *n* and the tapered collar *a*, the tapered collar *a* is forced toward the larger end of the tapered part *f* of the sleeve *g* and is expanded.

In the case illustrated in Figs. 1, 2, 3 and 4, the movement of the tapered collar *a* against the force of the spring *m* is effected by the shaft *h* being turned like the axles or pivots already in use with holders for the purpose aforesaid as hereinbefore commonly made, about a pivot *t* in an arm *u* furnished with parts *v* to act as cams against the collar *n* and provided with a spring *w* adapted to engage a notch *x* in part of the shaft *h* in order to hold the shaft *h* and the holder in the position in which they are indicated in Figs. 1 and 2 to keep a cone, or yarn, thread, cord, twine or the like wound upon such cone, against a winding drum.

When a paper or other cone *b* is to be applied to the holder shown in Figs. 1, 2, 3 and 4 the holder is placed in the position in which it is indicated in Fig. 3 by the shaft *h* being turned about the pivot *t*. The turning of the shaft *h* into the position in which it is shown in Fig. 3 causes the collar *n* to be acted upon by the cams *v* and forced in the direction opposite to that indicated by the arrow C against the force of the spring *m* and by means of the collar *n* causes the tapered collar *a* to be moved toward the smaller end of the tapered part *f* of the sleeve *g* so that the tapered collar *a* may contract in order that a paper or other cone *b* may easily be applied on the collar *a* and on the tapered part *i* of the sleeve *g*. When a tapered or other cone *b* is being applied to the collar *a* it is pressed firmly thereon and then the holder is turned back to the position in which it is shown in Figs. 1 and 2 so that the collar *n* being moved back along and withdrawn from contact with the cams *v* can be forced by the spring *m* in the direction indicated by the arrow C and cause the collar *a* also to be moved in the same direction so that being drawn along the tapered part *f* from the smaller to the

larger part thereof the collar *a* will be expanded so that its ridges *e* will engage the interior of the paper or other cone *b* and in being engaged with it will draw it farther in the direction indicated by the arrow C and more firmly on to the holder. As in being applied to the holder the paper or other cone *b* is firmly pressed on to the tapered collar *a* the movement of the collar *a* in the direction indicated by the arrow C and its expansion will be limited by the paper or other cone *b* and so should the paper or other cone *b* yield or expand in use the collar *a* will be moved farther in the direction indicated by the arrow C and so be further expanded and made again to engage closely the paper or other cone *b* and to keep it drawn closely on to the tapered part *i* of the sleeve *g* such movement of the collar *a* into engagement with the paper or other cone *b* being accompanied by further movement in the direction indicated by the arrow C in which the paper or other cone *b* is applied to the holder. By the holder being turned again into the position in which it is shown in Fig. 3 the ribs *e* of the collar *a* are withdrawn from the paper or other cone *b* so that it may be removed easily from the holder.

The ridges *c* are one illustrative form of engaging parts and these may be made different from those shown in Figs. 1, 2, 3 and 4 without departure from this invention.

In the holder illustrated in Figs. 5 and 6 the sleeve *g* is mounted and held in position axially on a shaft *h* similarly to the sleeve *g* shown in Figs. 1, 2, 3 and 4 formed at one end with a tapered part *i* of a taper corresponding to the taper of the interior of a tapered or other cone *b* near the smallest part thereof and is also formed at the other end with a tapered part *y* of a taper corresponding to the taper of the interior of a paper or other cone *b* near the largest part thereof and formed hollow and carried by a web or flange *z*.

Spring arms 1 which extend in the direction from the base to the tip of a cone *b* applied to the holder are shaped so that the parts 2 nearer their bases are inclined outward from the axis of the holder and the parts 3 nearer their tips are inclined toward the axis of the holder and furnished with points 4 inclined in the direction from the smaller to the larger parts of the tapered parts *i* and *y*. The springs 1 may conveniently form as shown arms extending through the web *z* from a ring 5 made to encircle, without touching, the shaft *h*. The ring 5 is secured in position by being placed between the sleeve *g* and a collar on the shaft *h*. The parts 3 of the springs 1 which are inclined toward the axis of the holder are preferably shaped so that when allowed to expand into engagement with a cone *b* applied to the holder they shall be parallel or approximately parallel to the parts of the cone *b* which are nearest to them. As shown the springs 1 are made to extend through holes in the web *z* of the tapered collar *y*.

In order that the springs 1 may be withdrawn from their expanded position a compressing device, shown for example, as comprising a collar 6 with arms 7 which extend through the web *z* and are formed with inwardly directed inclined faces on the inner sides to be made to bear on the outwardly inclined parts 2 of the springs 1 by the collar 6 being moved on the shaft *h* in the direction opposite to that indicated by the arrow C by means of the cams *v* formed on the part *u* by which the shaft *h* is carried.

When a paper or other cone *b* is to be applied to the holder shown in Figs. 5 and 6 the holder is placed in the position in which it is shown in Fig 6 by the shaft *h* being turned about the pivot *t*. The turning of the shaft *h* into the position in which it is shown in Fig. 6 causes the collar 6 to be acted upon by the cams *v* and forced in the direction opposite to that indicated by the arrow C and by means of the arms 7 acting on the parts 2 causes the points 4 of the springs 1 to be retracted toward the axis of the holder so that a paper or other cone *b* may easily be applied to the tapered parts *i y* of the sleeve *g*. When a paper or other cone *b* is being applied to the tapered parts *i y* of the sleeve *g* it is pressed firmly thereon and then the holder is turned back to the position in which it is shown in Fig. 5 so that the collar 6 being moved back over and withdrawn from contact with the cams *v* can be forced by the parts 2 of the springs 1 in the direction indicated by the arrow C and the springs 1 then expand so that their points 4 engage the paper or other cone *b*. In engaging the paper or other cone *b* the points 4 moving in some measure in the direction indicated by the arrow C will draw the cone *b* farther in the direction indicated by the arrow C and more firmly on to the tapered parts *i y* and as in being applied to the holder the paper or other cone *b* is firmly pressed on to the tapered parts *i y* of the sleeve *g* the expansion of the springs 1 will be limited by the paper or other cone *b* and so should the paper or other cone *b* yield or expand in use the springs 1 will expand further and keep closely in engagement with the cone *b* and keep it drawn tight on to the tapered parts *i y* of the sleeve *g*. By the holder being turned again into the position in which it is shown in Fig. 6, the points 4 of the springs 1 are withdrawn from the paper or other cone *b* so that it may be removed easily from the holder.

Details in the construction may be made different from those shown in Figs. 5 and 6, without departure from this invention.

A holder of this form may conveniently be provided with four springs to engage paper or other cones but one such spring or two or more may be employed as may be desirable in any case, the compressing device being made to correspond with the spring or springs employed.

In any case in which it is not desirable to use a cam or curved surface or incline brought into action by the movement of the axle or pivot for moving the taper ring or collar or compressing device or any equivalent therefor employed in a holder of either of the forms provided according to this invention, or in which the axle or pivot is not movable for disengaging cones applied to the holder, any suitable means for example a lever or slide or collar moved in any convenient manner may be used for moving such tapered ring or collar or compressing device or equivalent either in one direction or in both directions as may be desirable. As an illustration of these modifications of this invention Figs. 7, 8 and 9 show a construction in which a holder generally similar to that shown in Figs. 1, 2, 3 and 4 but with the part *g* formed integral with a shaft 8 mounted to revolve in a support 9 instead of as a sleeve. In this case the collar *n* is mounted on the shaft 8 and between the collar *n* and the support 9 there is mounted on the shaft 8 a hand lever 10 provided with spiral surfaces 11 presented to corresponding spiral surfaces 12 formed on the support 9. In the usual position of rest the hand lever 10 remains with the most prominent parts of the spiral surfaces 11 against the most deeply recessed parts of the spiral surfaces 12 of the support 9 and is wholly or nearly out of contact with the collar *n*. By the hand lever 10 being turned around the shaft 8 from the position in which it is shown in Fig. 7 and in full lines in Fig. 9 to the position in which it is shown in Fig. 8 and indicated in dotted lines in Fig. 9 the collar *n* may be moved along the shaft 8 in opposition to the force of the spring *m* in order that the tapered split collar *a* may be moved toward the smaller end of the tapered part *f* and allowed to contract to release the cone *b*. When a cone *b* is applied to the holder and is to be secured upon the holder the hand lever 10 is moved or allowed to move back from the position in which it is shown in Fig. 8 and indicated by dotted lines in Fig. 9 to the position in which it is shown in Fig. 7 and indicated by full lines in Fig. 9 and then the spring *m* forcing back the collar *n* draws the collar *a* toward the larger end of the tapered part *f* and causes it to engage the cone *b* as in the case of the holder shown in Figs. 1, 2, 3 and 4.

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

1. In a spindle or holder for cones in a winding machine, a revoluble support, engaging means mounted on such support for engaging cones to be applied to the spindle or holder and presenting engaging parts movable into position for engagement away from the axis of the revoluble support and axially of such support in the direction from the points or narrow ends to the bases or wider parts of the cones, resilient means for moving said engaging parts outwardly away from the axis of such support and in the direction from the points or narrow ends to the bases or wider parts of cones, devices intermediate the resilient means and engaging parts for enabling the resilient means so to move the engaging parts, and means for moving such engaging parts out of engagement.

2. In a spindle or holder for cones in a winding machine, a revoluble support having a tapered part, a tapered split ring surrounding and movable in the direction of the axis of the said tapered part and furnished outwardly with engaging parts, a collar movable in the direction of the axis of the revoluble support and in engagement with the tapered split ring, a spring interposed between the collar and the revoluble support and means for moving such collar.

3. In a spindle or holder for cones in a winding machine, a revoluble support having a tapered part with notches, a tapered split ring surrounding and movable in the direction of the axis of the said tapered part and furnished inwardly with grooves and outwardly with engaging parts, a collar movable in the direction of the axis of the revoluble support and with arms passed through the notches of the tapered part of the support and into grooves in the tapered split ring and a spring interposed between the collar and the support.

4. In a spindle or holder for cones in a winding machine, a shaft, a sleeve mounted to revolve around and held in position axially of the shaft and having a tapered part, a tapered split ring surrounding and movable in the direction of the axis of the sleeve and furnished outwardly with engaging parts, a collar capable of being turned around and movable axially upon the shaft and in engagement with the tapered split ring, and a spring interposed between the collar and the sleeve, whereby the engaging parts of the ring are made to pull cones more firmly on to the spindle or holder in passing into or keeping in engagement with them.

5. In a spindle or holder for cones in a

winding machine, a shaft, a sleeve mounted to revolve around and held in position axially of the shaft and having a tapered part with notches, a tapered split ring surrounding and movable in the direction of the axis of the sleeve and furnished inwardly with grooves and outwardly with engaging parts, a collar capable of being turned around and movable axially upon the shaft and with arms passed through the notches of the sleeve and into grooves in the tapered split ring and a spring interposed between the collar and the sleeve.

In testimony, that we claim the foregoing as our invention, we have signed our names in presence of two witnesses, this twenty-eighth day of September 1915.

HERBERT HOLT.
ALFRED SEELEY.

Witnesses:
HOWARD CHEETHAM,
RUTH M. WILSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."