

No. 764,744.

PATENTED JULY 12, 1904.

C. E. METCALF.

BOBBIN CLUTCHING MEANS FOR SPINNING SPINDLES.

APPLICATION FILED APR. 18, 1904.

NO MODEL.

Fig. 2.

Fig. 1.

Fig. 3.

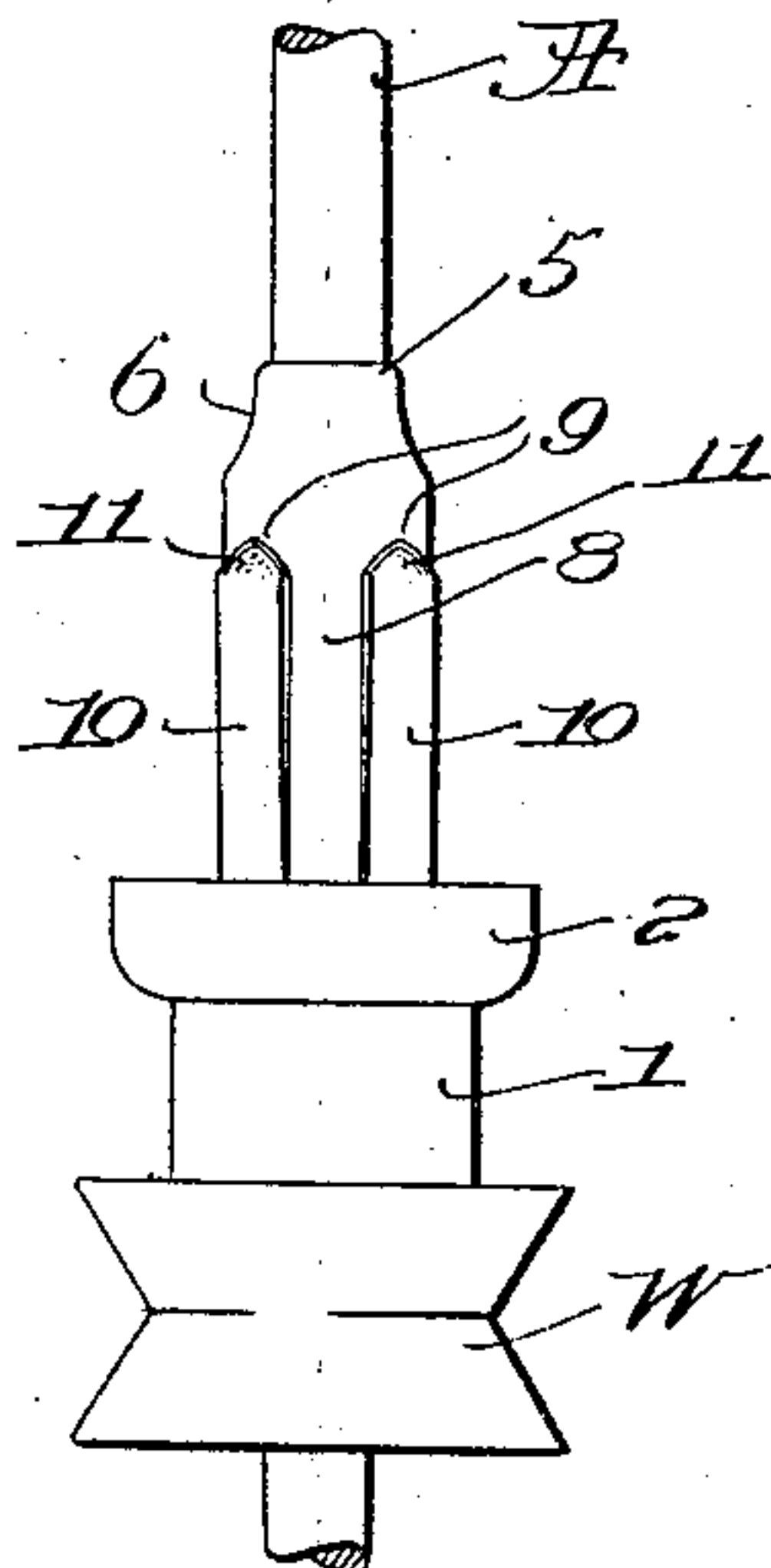
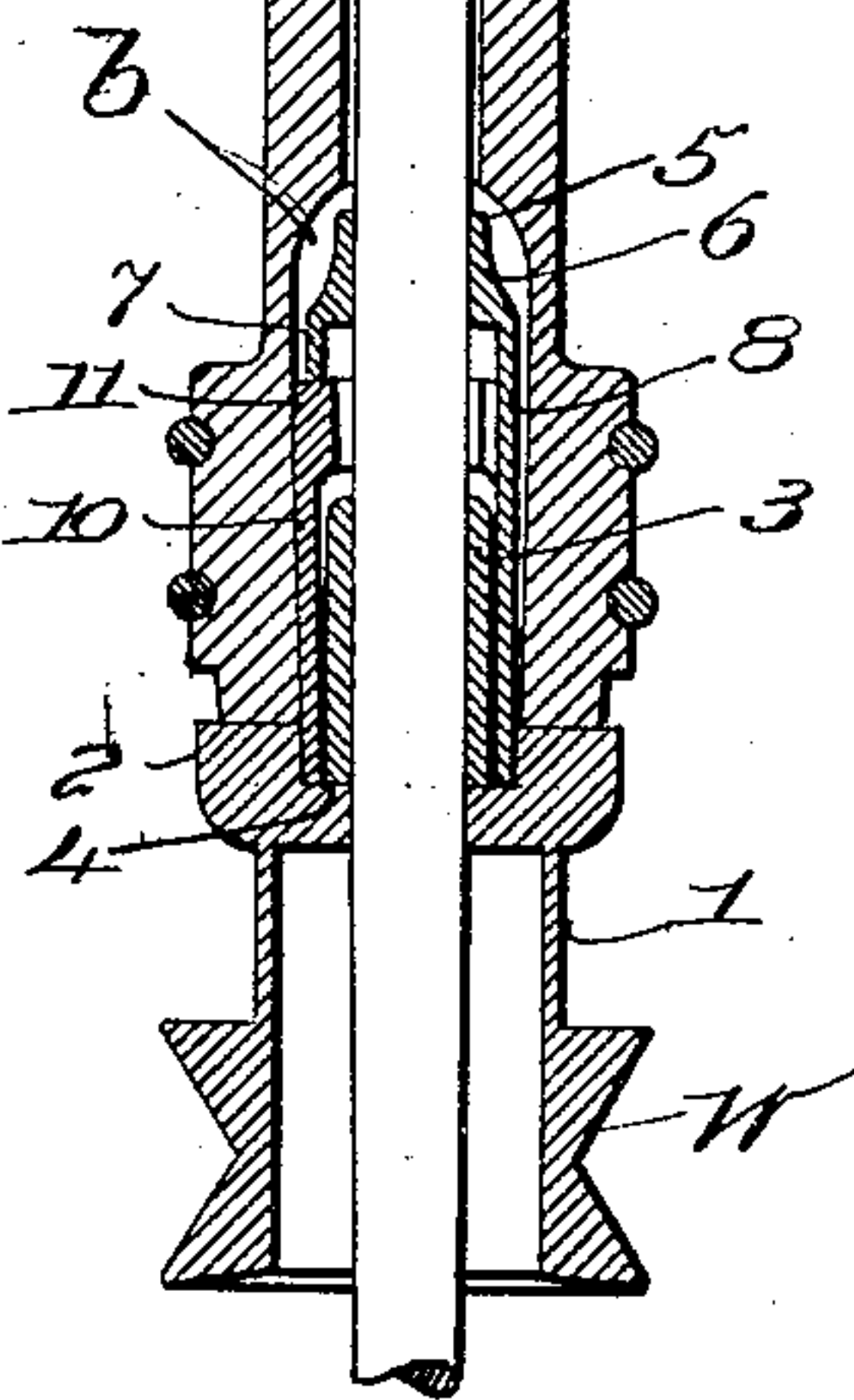
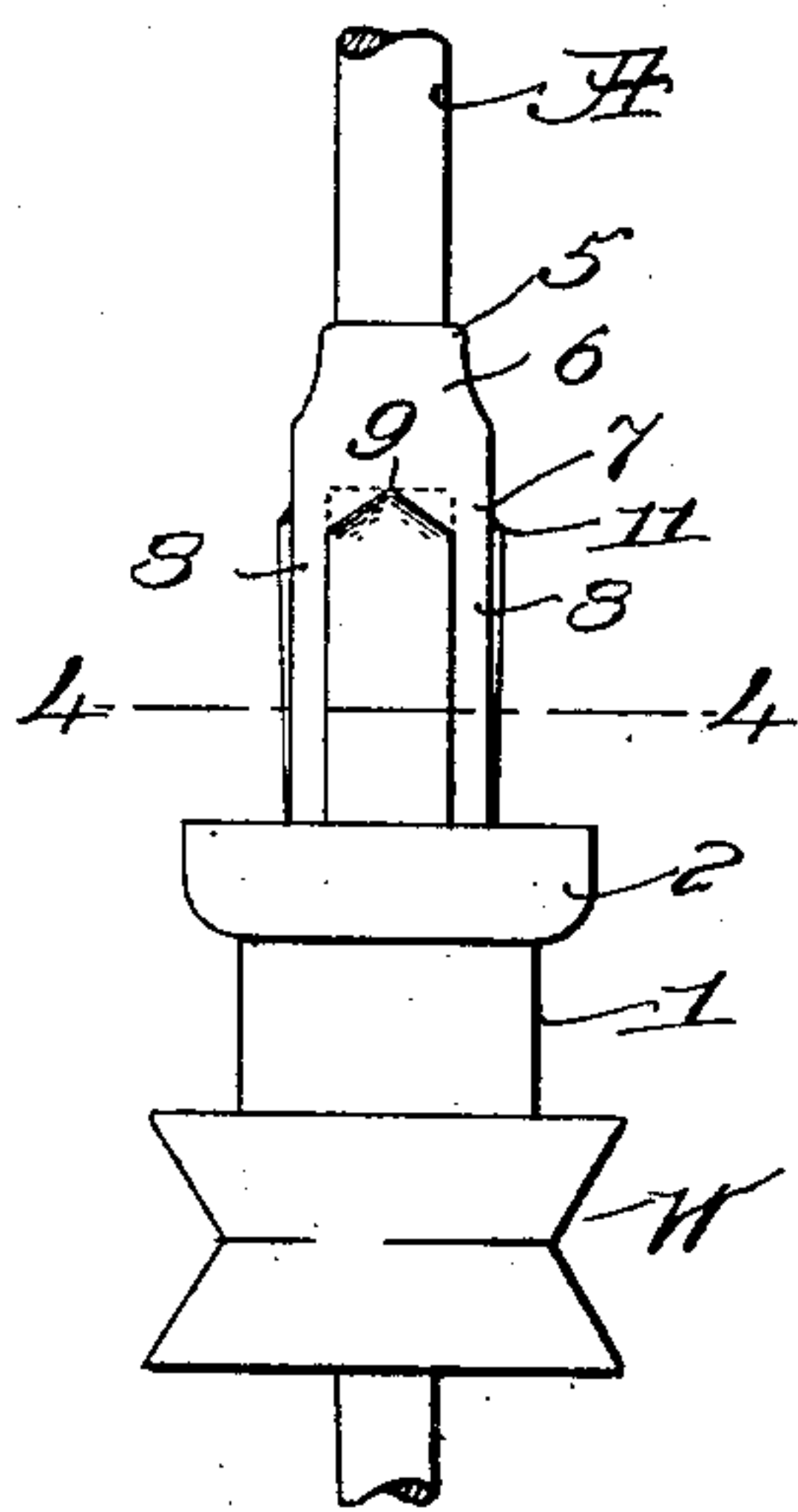
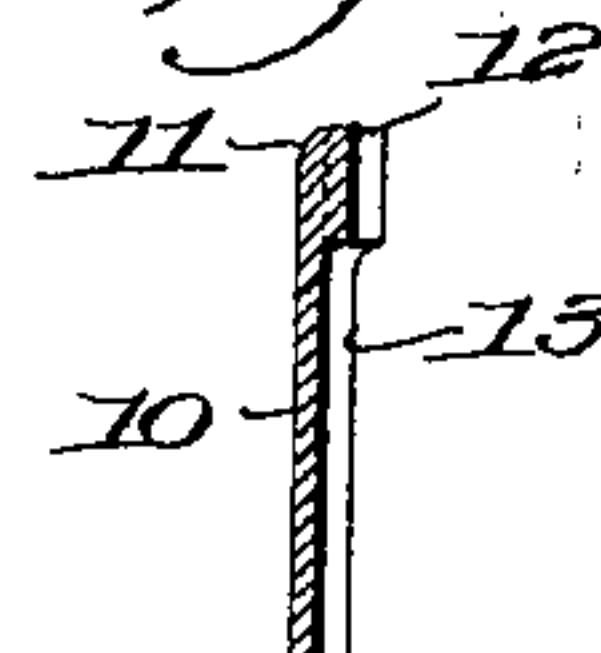
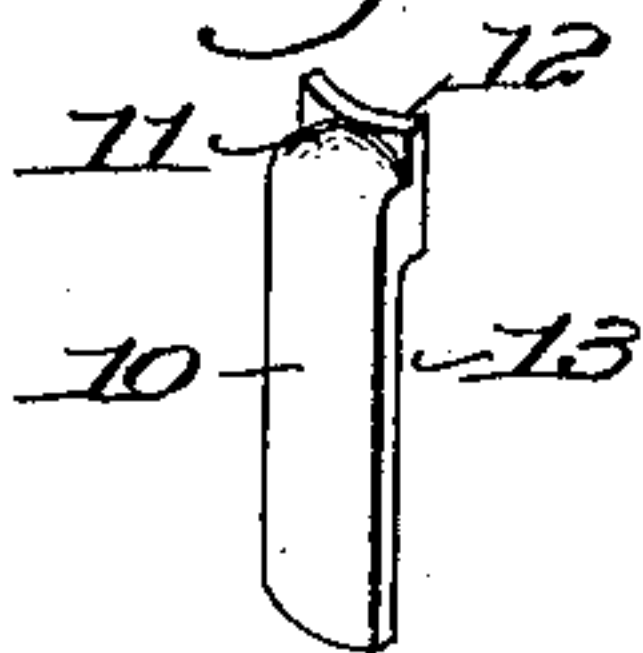
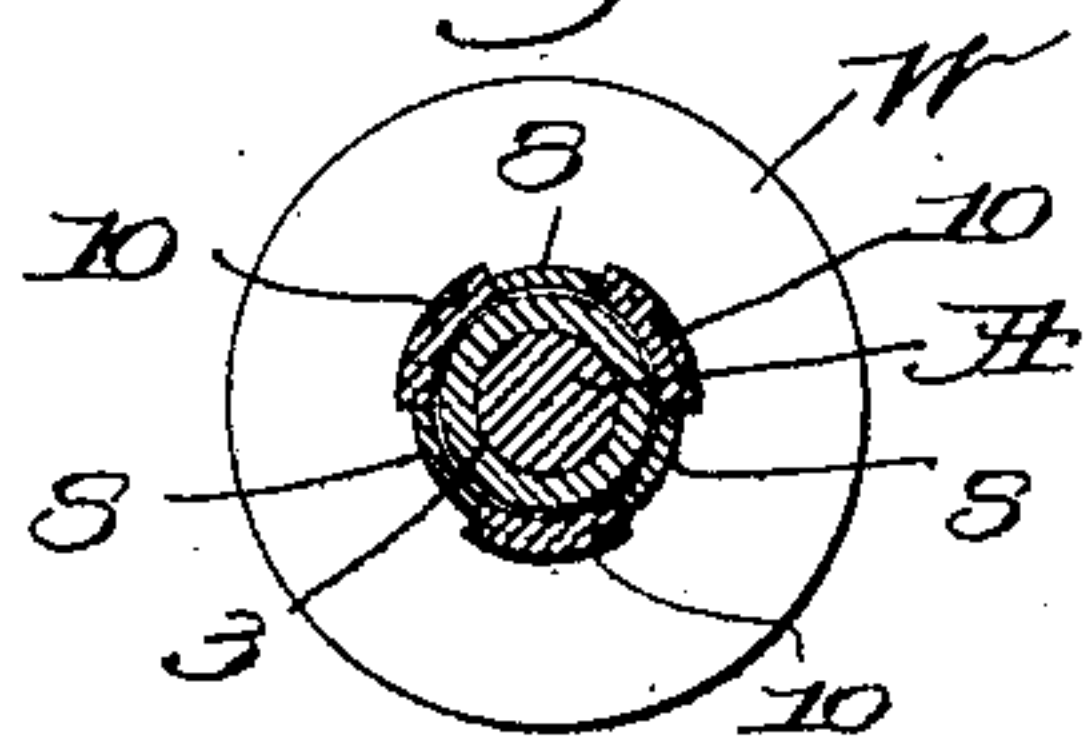


Fig. 4.

Fig. 5.

Fig. 6.



Witnesses,  
Edward F. Allen.  
Warren & Owen

Inwitness:  
Clarence E. Metcalf,  
by Lewis & Sugony,  
attys.

# UNITED STATES PATENT OFFICE.

CLARENCE E. METCALF, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO  
SAWYER SPINDLE COMPANY, A CORPORATION OF MAINE.

## BOBBIN-CLUTCHING MEANS FOR SPINNING-SPINDLES.

SPECIFICATION forming part of Letters Patent No. 764,744, dated July 12, 1904.

Application filed April 18, 1904. Serial No. 203,559. (No model.)

*To all whom it may concern:*

Be it known that I, CLARENCE E. METCALF, a citizen of the United States, residing at Hopedale, county of Worcester and State of Massachusetts, have invented an Improvement in Bobbin-Clutching Means for Spinning-Spindles, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention has for its object the production of novel means for retaining a yarn-receiver or bobbin in position upon a rotating, spinning, twisting, or other similar spindle and effecting the rotation of the bobbin with the spindle during the spinning operation.

My invention relates more particularly to spinning-spindles of the type wherein centrifugally-acting bobbin-clutching members are mounted upon and rotate with the spindle, such type of apparatus being shown in United States Patent No. 734,747, dated July 28, 1903. In devices of this character the bobbin may be readily applied to the rotating spindle and as readily removed therefrom or doffed, while the centrifugal force due to rotation of the spindle causes the bobbin-retaining means to engage and firmly hold the bobbin in operative position.

The various novel features of my invention will be fully described in the subjoined specification, and particularly pointed out in the following claims.

Figure 1 is a side elevation of a spinning-spindle with one embodiment of my bobbin-retaining means applied thereto. Fig. 2 is a longitudinal sectional view thereof on the line 2-2, Fig. 1, with a bobbin in position on the spindle. Fig. 3 is a detail view similar to Fig. 1, but with the spindle turned about one-quarter of a revolution. Fig. 4 is a transverse section on the line 4-4, Fig. 1, looking down. Fig. 5 is a perspective view of one of the clutching members, and Fig. 6 is a longitudinal section thereof.

The rotatable spindle A of usual construction has an attached whirl W, the whirl having an upturned sleeve 1, provided at its up-

per end with an enlarged circular head 2, through a central hole in which the spindle is tightly driven, as shown in Fig. 2, a short sleeve 3 being rigidly secured to the spindle and extending down to the head. The head 2 forms a support or rest for the head of the bobbin B, as shown in Fig. 2, so that the bobbin is maintained at the proper height during the spinning operation. An annular recess or raceway 4 is formed in the upper face of the head or support 2 to loosely receive and hold the lower ends of the centrifugally-acting bobbin-clutching members, to be referred to, and to limit outward or radial movement thereof. Above the support 2 the spindle has fixedly attached to it a collar 5, having a flared base 6, terminating in an annular downturned flange 7, and in the present embodiment of my invention a series of equidistant elongated extensions 8 depend from the flange, the lower ends of the extensions entering the recess or raceway 4. The collar and extensions may conveniently be made of a piece of tubing longitudinally cut out to form the separated extensions and properly spun into the desired shape to form the collar 5 and adjacent portions. An upper motion-limiting raceway is formed by the annular space between the flange 7 and the adjacent portion of the spindle, the upper extremities of the clutching members extending loosely thereinto, as will be described. By reference to Figs. 1 and 3 it will be seen that the flange 7 is notched or recessed between the extensions to form substantially  $\Lambda$ -shaped or concave portions 9 for a purpose to be described.

The clutching members are stamped or struck out from sheet metal of proper thickness, and each member comprises an elongated body 10, (see Figs. 5 and 6,) which is segmental in cross-section to fit loosely around the spindle, the upper end of the body being shaped to correspond with one of the recesses or notches 9, as shown at 11. The upper end of the body is inset and upturned behind the part 11, as at 12, to form a head which is considerably thinner than the body, as shown clearly in Figs. 5 and 6, and I have also shown



the lower portion of the body as made somewhat thinner, as at 13, to fit properly about the sleeve 3 on the spindle.

In assembling the parts the clutching members are interposed between the extensions 8 and their lower ends are loosely inserted in the raceway 4, while their inset heads 12 are passed up inside of the flange 7 of the collar 5. When the parts are in position, the shaped upper ends 11 of the body can move radially in the flange notches or recesses 9 of corresponding shape, while the heads 12, which cross such notches behind the flange, limit outward movement of the upper ends of the clutching members when the latter are moved outward by centrifugal force.

The edges of the upper end 11 of each clutching member are rounded or convexed to permit the easy entrance thereof into the chamber 6, (see Fig. 2,) made by enlarging the bore of the bobbin within the head thereof.

By making the recesses in the flange 7 and shaping the upper portions of the clutching members to fit loosely therein I obviate any chance for a thread or yarn to be caught, because it will wind around the said members, but cannot become caught, as there are no substantially horizontal crevices or recesses in which it can enter. Manifestly the same result will be secured if the flange-notches are made of a flatter  $\Lambda$  shape or even curved.

I prefer to so arrange the upper and lower motion-limiting raceways that the clutching members can move outward to a greater extent at their upper ends than at their lower ends, so that the main driving engagement with the walls of the bobbin-chambers will be at the upper portion thereof, thereby overcoming any tendency of the bobbin to rise on the spindle during spinning. The extensions 8 laterally separate the clutching members and also act against their upright side edges to positively rotate them with the spindle. The bobbin when placed upon the spindle engages and presses the clutching members inward until the end of the bobbin is seated on the rest 2, the centrifugal force then causing said members to firmly engage the side walls of the chamber 6. This chamber may be made with its walls upwardly placed to still further assist the clutching members in holding the bobbin down; but I make no claim to such construction of the bobbin, as the same is not of my invention. The extensions 8 are also adapted to limit any lateral motion of the bobbin, as the outer surfaces of such extensions are in very close proximity to the wall of the bobbin-chamber, and if one or more of the clutch members were pushed in far enough by a lateral pull on the bobbin the lateral movement of the latter would then be limited by engagement with the adjacent extension. Sometimes the pull of the yarn tends to cause the bobbin to have an unsteady motion with relation to the spindle-center,

the clutching members yielding to a certain extent, and such side play of the bobbin, which may be induced by an unbalanced load, will be limited by engagement with a part fixed relatively to the spindle.

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

1. The combination with a rotatable spindle having an attached bobbin-rest provided with an annular recess in its upper face, of a collar fixedly secured to the spindle above said bobbin-rest and having depending, equidistant extensions projecting into the recess, and centrifugally-acting bobbin-clutching members interposed between said extensions and loosely held at their upper and lower ends within the collar and recess, respectively, said extensions laterally separating the clutching members and causing positive rotation thereof by engagement with their upright side edges.

2. The combination with a rotatable spindle having an attached bobbin-rest provided with an annular recess in its upper face, of a collar fixedly secured to the spindle above said bobbin-rest and having a downturned annular flange and depending, equidistant extensions on the flange projecting into the recess, and centrifugally-acting bobbin-clutching members interposed between said extensions with their lower ends loosely held in the annular recess, each of said members having its upper end set in and upturned within the flange of the collar, to be loosely held thereby.

3. The combination with a rotatable spindle having an external, annular motion-limiting raceway, of a collar fixedly secured to the spindle above said raceway and having a depending annular flange provided with elongated, depending extensions entering the raceway at their lower ends, the flange being upwardly notched between the extensions, and centrifugally-acting bobbin-clutching members interposed between the extensions and having their lower ends loosely held in the raceway, the upper ends of said members being shaped to correspond with the notches and having inset, upturned heads extended above the notches inside of the flange.

4. The combination with a rotatable spindle having an external, annular motion-limiting raceway, of a collar fixedly secured to the spindle above said raceway and having a depending annular flange provided with downturned equidistant extensions, the flange between said extensions having substantially  $\Lambda$ -shaped notches, and centrifugally-acting bobbin-clutching members loosely held at their upper and lower ends by the flange and raceway respectively, said members being interposed between the extensions and having their upper ends shaped to correspond with the shape of the flange-notches and having inset, upturned heads extended above the notches within the flange.



5. The combination with a rotatable spindle having an external, annular motion-limiting raceway, of a collar fixedly secured to the spindle above said raceway and having a depending annular flange having a plurality of equidistant notches or recesses in its lower edge, elongated extensions integral with the flange and depending therefrom between the notches, and a series of centrifugally-acting bobbin-clutching members coaxial with the spindle interposed between the extensions and having their lower ends loosely held in the raceway, the upper ends of the said members being shaped to move radially in and out of the notches or recesses in the flange, each member having an inset, upturned head extended above the notched portion of the flange and within the latter, to limit outward move-

ment of the upper end of such clutching member.

6. In a rotatable spindle, a centrifugally-expansible bobbin-retaining device, to engage the interior of and effect rotation of the bobbin with the spindle, and means fixed with relation to the spindle to freely enter and normally fit loosely within the bobbin and adapted to limit lateral motion thereof induced by an unbalanced load.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CLARENCE E. METCALF.

Witnesses:

GEORGE OTIS DRAPER,  
ERNEST W. WOOD.