

No. 726,570.

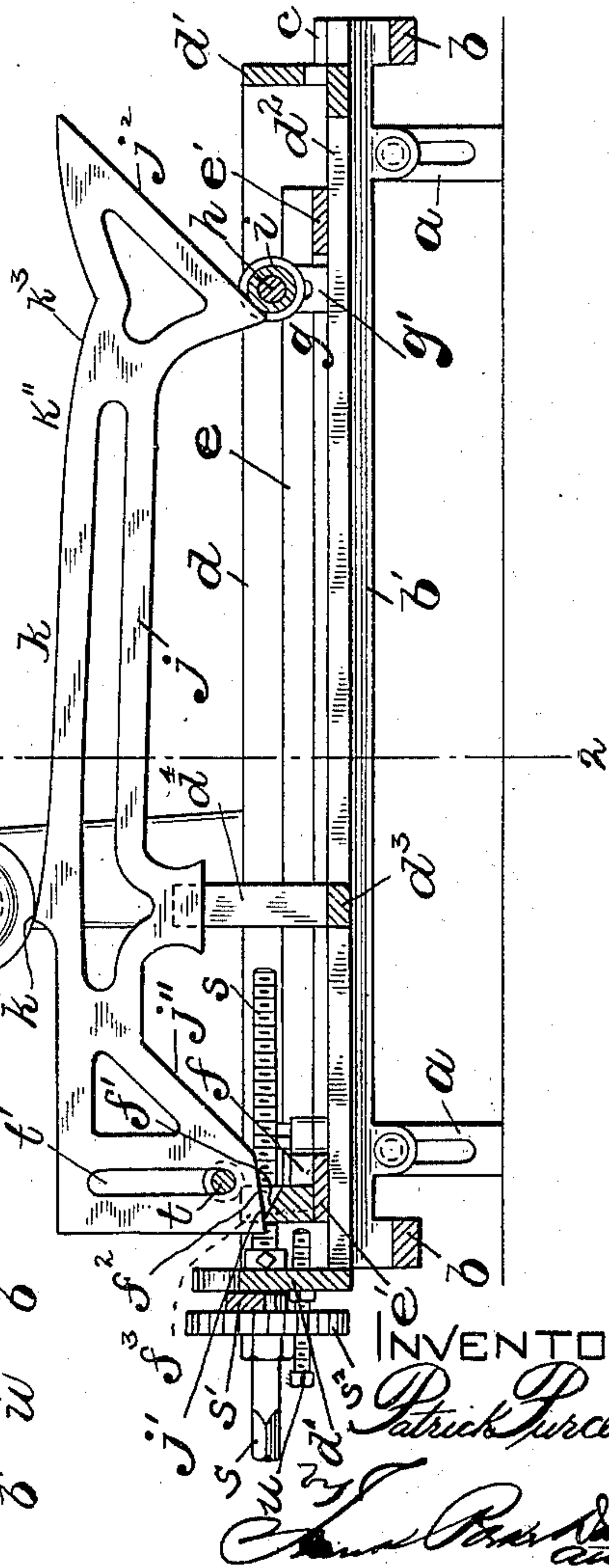
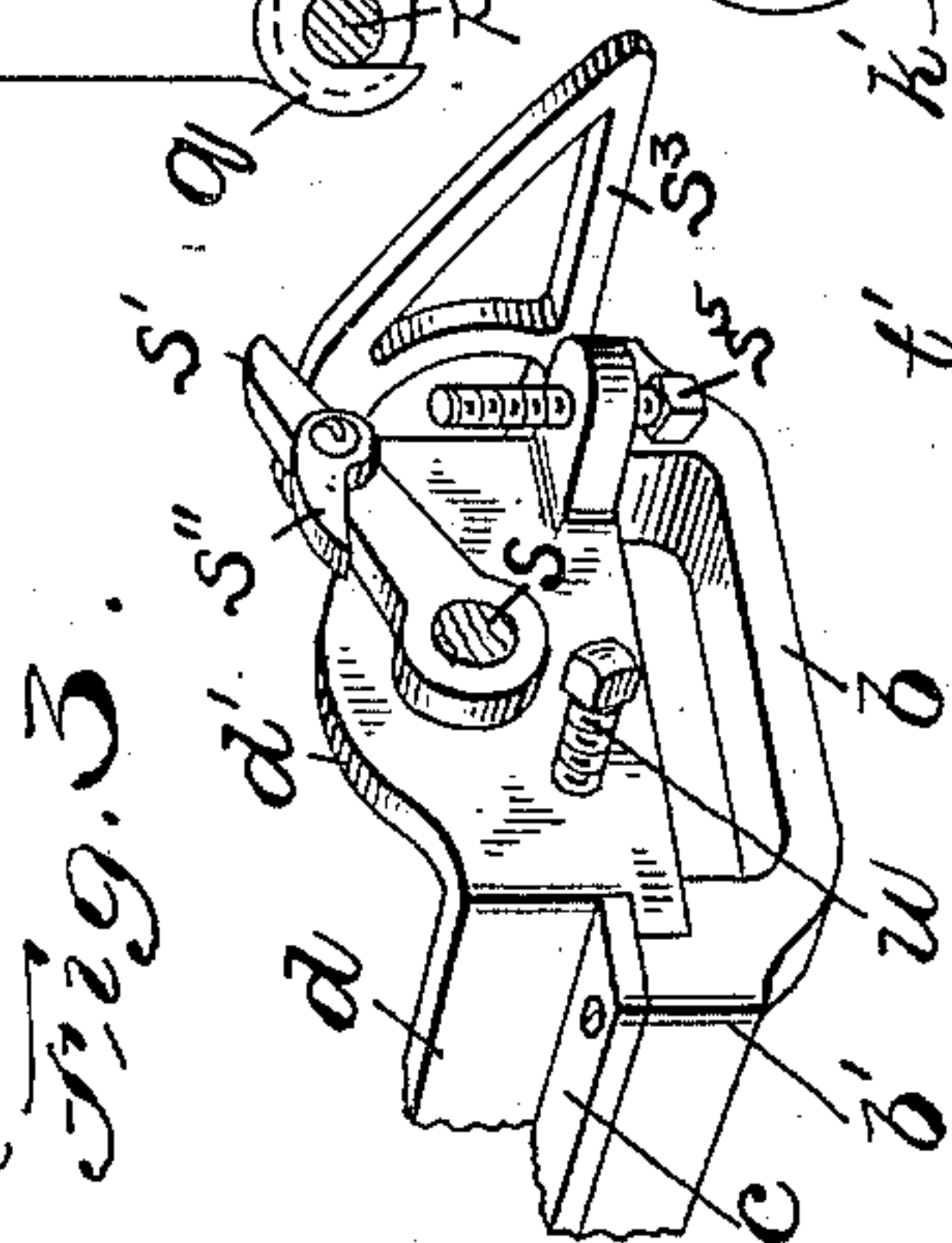
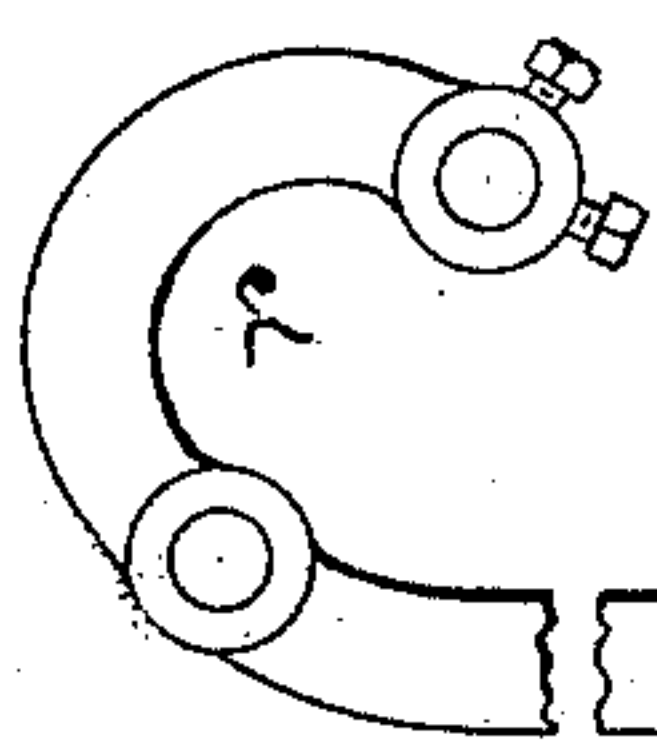
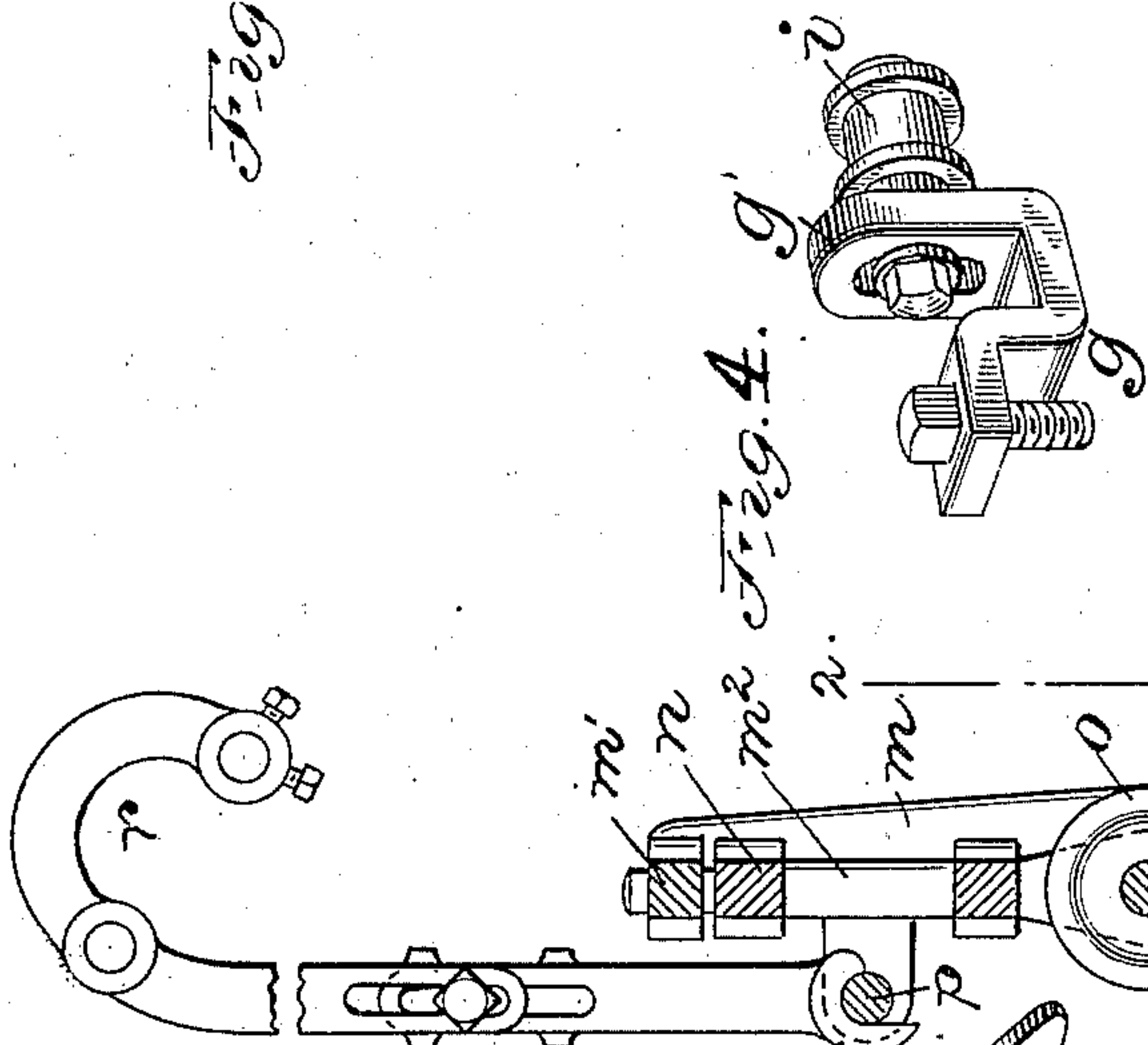
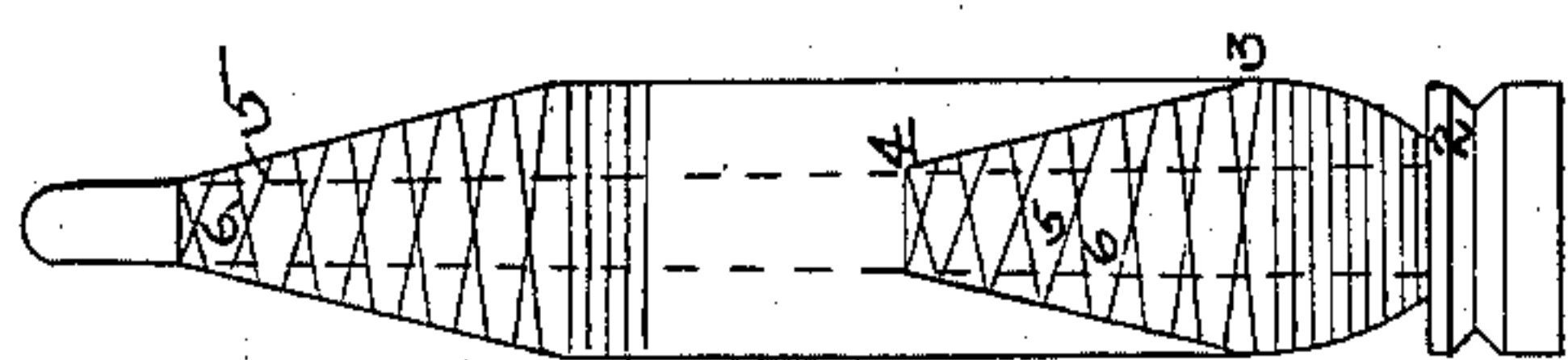
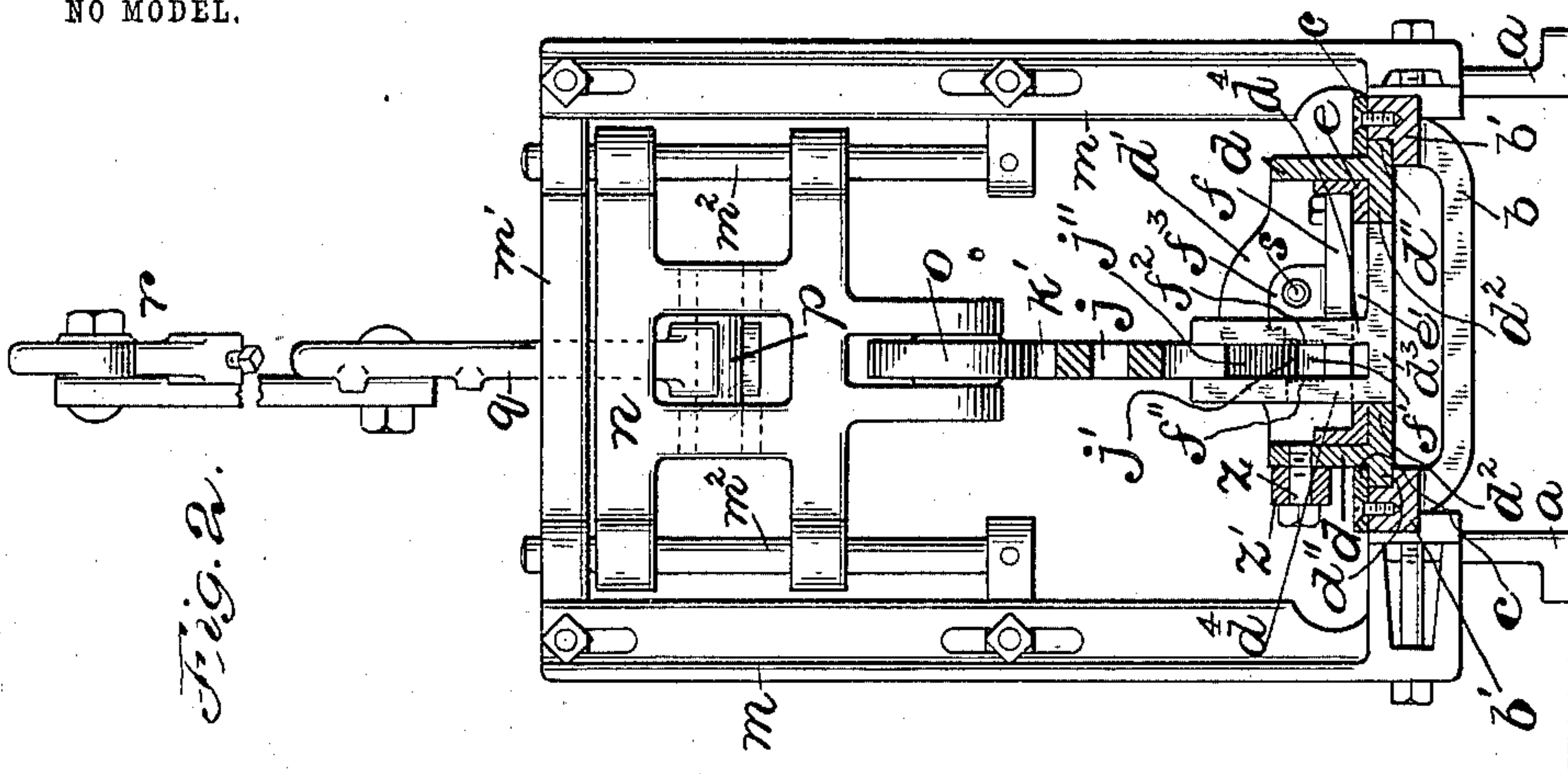
PATENTED APR. 28, 1903.

P. PURCELL.

YARN GUIDE CONTROLLING MECHANISM FOR BOBBIN OR COP BUILDERS.

APPLICATION FILED FEB. 15, 1902.

NO MODEL.



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UNITED STATES PATENT OFFICE.

PATRICK PURCELL, OF PROVIDENCE, RHODE ISLAND.

YARN-GUIDE-CONTROLLING MECHANISM FOR BOBBIN OR COP BUILDERS.

SPECIFICATION forming part of Letters Patent No. 726,570, dated April 28, 1903.

Application filed February 15, 1902. Serial No. 94,209. (No model.)

To all whom it may concern:

Be it known that I, PATRICK PURCELL, of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Yarn-Guide-Controlling Mechanism for Bobbin or Cop Builders, of which the following is a specification.

The present invention relates to mechanism for controlling the winding of yarns in the building of bobbins or cops on machines designed for this particular purpose wherein the yarns are taken from a large drum and the ends led to a line of bobbin-carrying spindles, and the principal objects are to provide for a cross-wind which will effectually prevent slubbing off when the yarn is doffed from the bobbin, my invention insuring the crossing of each convolution laid on in a traverse of the yarn-guide in one direction by a convolution laid on in the traverse of the said guide in the opposite direction, to wind a greater quantity of yarn on a bobbin without increasing the dimensions of the finished product, and to obviate loose winding at the base and nose of the cop.

Another object of the invention is to provide for such latitude of adjustment throughout the mechanism as will enable the building of the cop to be governed to a nicety according to the character of yarn and just the desired build of bobbin attained under all circumstances.

Of course it will be understood that the build of the bobbin depends upon the manner in which the yarn is guided along the spindle, and it is the mechanical agencies by which this is controlled that I have treated in evolving the present invention.

Of the drawings which accompany and form part of this specification, Figure 1 represents a complete machine embodying my invention, shown partly in side elevation and partly in section. Fig. 2 shows the same in cross-section, taken on line 2-2 of Fig. 1. Fig. 3 shows in perspective certain means for effecting intermittent adjustment. Fig. 4 shows a detail in perspective; and Fig. 5 represents diagrammatically a complete cop, illustrating the wind effected by the operation of my invention.

The base of the machine, which rests fixedly upon the floor of the mill, comprises legs *a* and a rectangular frame composed of end bars *b* and side bars *b'*, with offsets on the inner sides extending from end to end of the bars and providing slideways which have cover-strips *c*, secured to the frame-bars, as clearly shown in Fig. 2. A carriage of rectangular form is supported by said base and composes upright sides *d* and ends *d'*, outer base-flanges *d''*, engaging the slideways of the supporting-frame, inner base-flanges *d'''*, and an intermediate cross-bar *d³*, from which rise a pair of uprights *d⁴*. One of the upright sides of the said carriage is formed with a series of holes, in any one of which may be secured a wrist-pin *z* for a pitman *z'*, through which the carriage is reciprocated by connection with a power-driven crank of the machine. Within the carriage and resting upon its flanges *d²* is a supplemental carriage composed of angular side bars *e* and connecting end bars *e'*, and this supplemental carriage has secured upon its forward cross-bar a block *f*, comprising a beveled-edge bearing *f'* between shoulders *f''* and *f²*, and a nut *f³*. At the opposite end of the supplemental carriage there is adjustably secured a bracket *g*, having a slotted upright portion *g'*, in which is fastened a stud *h*, supporting a flanged roller *i*. The latter and the edge *f'* of block *f* support a cam-rail *j*, which is guided and held in place by the shoulders *f''* and *f²*, the uprights *d⁴*, and the flanges of the roller *i*. The rail is held from longitudinal movement by a screw *t*, engaging a vertical slot *t'* in the rail and entered in a part of the fixed frame of the machine. The bottom edge of this rail extends from the front end rearwardly a comparatively short distance on a slight upward angle, as shown at *j'*, and thence for a greater distance on a sharp upward angle, as shown at *j''*. At the opposite end the edge of the rail runs on the angle of the said part *j''*, as shown at *j²*, there being no edge portion corresponding in angularity with the front edge portion *j'*. The top edge of the bar has an acting stretch *k* extending from a forward elevated point *k'* first downward a short distance on a comparatively abrupt angle, thence on a slight downward angle a considerable

distance to a point k'' , and then more sharply downward a short distance, as shown at k^3 . Uprights m , secured to the sides b' of the supporting-frame and connected by a top cross-bar m' , carry guide-rods m^2 , on which a vertically-reciprocating frame n is mounted, this frame carrying a roller o , resting upon the top edge of the cam-rail. Another roller p on the front of said frame is straddled by the hook q , which connects with the sickle r of the yarn-guiding structure, so that reciprocations of the frame n control the building of the cop.

The means for varying the traverse of the frame n by shifting the position of the cam-rail comprise a screw s , journaled in the front end of the carriage and engaging the nut f^3 , an arm s' , journaled on said screw and carrying a pivoted pawl s'' , a ratchet s^2 , affixed to the screw and engaged by the pawl, a cam s^3 , affixed to the base of the machine in the path of the said arm, and a stop-screw s^5 , secured in a lug of the carriage to limit the gravitation of the arm. It will be seen that through the above-described means a step-by-step shifting of the inner frame or supplemental carriage may be effected. The throw of the pawl will be so regulated by adjustment of the screw s^5 that it will in each action turn the ratchet-wheel the extent of a single tooth.

It will now be seen that with constant reciprocation of the carriage and intermittent shifting of the supplemental carriage the yarn-guide may be varied in its traverse to suit requirements in the building of the cop. At the outset of the operation, when the bobbins are bare and the winding is to commence, the inner or supplemental carriage is in its farthest forward position, so that the slightly-inclined part j' of the under edge of the cam-rail rests at its forward part upon the supporting-edge f' , while the lowermost part of the rear edge j^3 rests upon the roller i . Under these conditions the traverse of the carriage back and forth lays the yarn on the bobbin from the base a given distance toward the nose. As the inner or supplemental carriage is shifted step by step the cam-rail lowers, so that the laying on of the yarn will commence at a higher point on the bobbin with each reciprocation of the carriage and finish higher up on the bobbin. In order, however, to obtain the desired filling out of the bobbin at the base, I have fashioned the lower edge of the cam-rail as shown and described, so that until the supporting edge f' passes the slightly-inclined part j' the front end of the cam-rail is not lowered to the same extent as the rear end, and consequently the advance of the point of commencement of the laying on of a course of yarn is retarded as compared with the advance of the point of completion thereof toward the nose, with the result that the yarn is built out at the base of the bobbin on a shaper angle to the bobbin than is followed in forming the nose of the cop. The supporting edge f' leaves the slightly-inclined

part j' of the cam-rail when the full diameter of the cop is attained, and thereafter the rail lowers to the same extent at each end, so that the point of commencement of the upward traverse of the yarn-guide advances to the same extent with each reciprocation of the carriage as does the point of completion. In the diagram Fig. 5 lines 2 3 4 indicate the cross-section the cop has attained when the supporting edge f' passes the slightly-inclined part j' of the under edge of the cam-rail. It will be noted that no conical enlargement of the bobbin-quill is necessary at the base portion in order to fill out the yarn, and consequently more yarn can be carried on the bobbin under my method of winding.

The extent of traverse of the yarn-guide is of course governed by the upper edge of the cam-rail on which the roller rests, and as the adjustment of the rail remains the same during a complete up-and-down movement of the yarn-guide the same number of winds of yarn are laid on during both traverses of the guide, and each convolution laid on under one direction of traverse is crossed by a convolution laid on under the reverse direction of traverse of the yarn-guide, so that the yarn is tied on and slubbing effectually guarded against. This cross-winding is indicated in the diagram Fig. 5 by the lines 5 6. It is to be noted that the increased inclination of the upper edge of the cam-rail at the points k^3 and k' will result in accentuating the rise and fall of the yarn-guide when it takes the yarn around the extremity of the nose of the cop and at the base of the latter, thereby insuring a tight wind at these points, which is highly desirable.

The provision for adjustment of the roller i makes it possible to vary the traverse of the yarn-guide to suit different conditions. The forward position of the inner or supplemental carriage will be regulated by a stop-screw u , entered through the front cross-bar of the main carriage. When a set of bobbins has been filled and another set is to be started, the inner carriage can be run back to the starting-point by application of a crank to the squared end of the screw s .

It will now be seen that the construction described is well calculated to fulfil all of the objects primarily stated. However, this construction may be modified without departing from the spirit and scope of the invention.

Having thus described my invention, what I claim as new is as follows:

1. In a cop or bobbin builder, the combination with the yarn-guide follower; of a rail upon which said follower rests, said rail having an upper edge comprising an elongated portion with a gradual and uniform inclination and an abbreviated portion at the lower end of said elongated portion and more sharply inclined than the latter; together with means for reciprocating the rail the combined length of its said edge portions; and means for intermittently changing the elevation of

said rail between each reciprocation, substantially as described.

2. In a cop or bobbin builder, the combination with the yarn-guide follower; of a rail 5 upon which said follower rests, said rail having an upper edge comprising an elongated portion with a gradual and uniform inclination and an abbreviated portion at the lower end of said elongated portion and more 10 sharply inclined than the latter; together with means for reciprocating the rail the combined length of its said edge portions; and means for intermittently changing the elevation of said rail between each reciprocation, with 15 provisions for tilting the same, substantially as described.

3. In a cop or bobbin builder, the combination with the yarn-guide follower; of a rail 20 upon which said follower rests, said rail having an upper edge comprising an elongated portion with a gradual and uniform inclination and an abbreviated portion at the lower end of said elongated portion and more 25 sharply inclined than the latter, said rail having correspondingly-beveled under edges at each end; connected rests on which said edges bear; a carriage for said rail and rests; means for reciprocating said carriage, and means 30 for moving the rests step by step in the carriage, substantially as and for the purpose described.

4. In a cop or bobbin builder, the combination with the yarn-guide follower; of a rail 35 upon which said follower rests, said rail having an upper edge comprising an elongated portion with a gradual and uniform inclination and an abbreviated portion at the lower end of said elongated portion and more 40 sharply inclined than the latter, said rail having correspondingly-beveled under edges at each end, with an additional differentiated bevel at one end; connected rests on which said edges bear; a carriage for said rail and rests; means for reciprocating said carriage; 45 and means for moving the rests step by step in the carriage, substantially as and for the purpose described.

5. In a cop or bobbin builder, the combination with the yarn-guide follower; of a rail 50 upon which said follower rests, said rail having a cam-shaped upper edge and under edges at each end correspondingly beveled; connected rests on which said edges bear; a carriage for said rail and rests; means for reciprocating said carriage; and means for moving 55 the rests step by step in the carriage, substantially as and for the purpose described.

6. In a cop or bobbin builder, the combination with the yarn-guide follower; of a rail 60 upon which said follower rests, said rail having a cam-shaped upper edge and under edges at each end correspondingly beveled with an additional differentiated bevel at one end; connected rests on which said edges bear; a carriage for said rail and rests; means for reciprocating said carriage, and means for mov-

ing the rests step by step in the carriage, substantially as and for the purpose described.

7. In a cop or bobbin builder, the combination with the yarn-guide follower; of a rail 70 upon which said follower rests, said rail having an upper edge comprising an elongated portion with a gradual [and uniform inclination and an abbreviated portion at the lower end of the said elongated portion and 75 more sharply inclined than the latter, said rail having correspondingly-beveled under edges at each end; adjustable rests on which said edges bear; a carriage for said rail and rests; means for reciprocating said carriage; 80 and means for moving the rests step by step in the carriage, substantially as and for the purpose described.

8. In a cop or bobbin builder, the combination of a supporting-frame comprising horizontal and upright portions; a sliding fol- 85 lower in the upright portion thereof with suitable yarn-guide connections; a reciprocating carriage on the horizontal portions of the frame; an inner carriage adjustable longitudinally of the first-named carriage and 90 equipped at opposite ends with rests; a rail having angular under edges bearing on said rests respectively and an inclined upper edge upon which the follower rides; and means 95 for shifting the inner carriage between reciprocations of the main carriage, substantially as described.

9. In a cop or bobbin builder, a reciprocating rail, the same having an upper edge comprising a moderately-inclined intermediate 100 portion and more sharply inclined end portions, substantially as and for the purpose described.

10. In a cop or bobbin builder, a reciprocating rail, the same having an upper edge comprising an elongated moderately-inclined portion and a more sharply inclined abbreviated 105 portion at the lower end of the latter, substantially as and for the purpose described. 110

11. The combination with the yarn-guide follower; of a cop-rail upon whose upper edge said follower bears; a pair of rests for opposite ends of said rail with provisions for 115 varying the elevation of the rail by changing the longitudinal relations of the same and the two rests; means for intermittently changing such longitudinal relations; and means for reciprocating the rail and rests as one, substantially as described. 120

12. The combination with the yarn-guide follower; of a cop-rail upon whose upper edge said follower bears; a pair of rests for opposite ends of said rail with provisions for 125 varying the elevation of the rail differentially at opposite ends by changing the longitudinal relations of the same and the two rests; means for intermittently changing such longitudinal relations; and means for reciprocating the rail and rests as one, substan- 130 tially as described.

13. The combination of a yarn-guide fol-

lower; a cop-rail on which the latter bears;
means for reciprocating the rail; and means
for intermittently changing its elevation,
with provisions for differential change of ele-
5 vation at opposite ends to vary the inclina-
tion of the rail, substantially as described.

In testimony whereof I have signed my

name to this specification, in the presence of
two subscribing witnesses, this 7th day of
February, A. D. 1902.

PATRICK PURCELL.

Witnesses:

GEORGE GEB,

WILLIAM WOODLOCK.