

No. 610,162.

Patented Sept. 6, 1898.

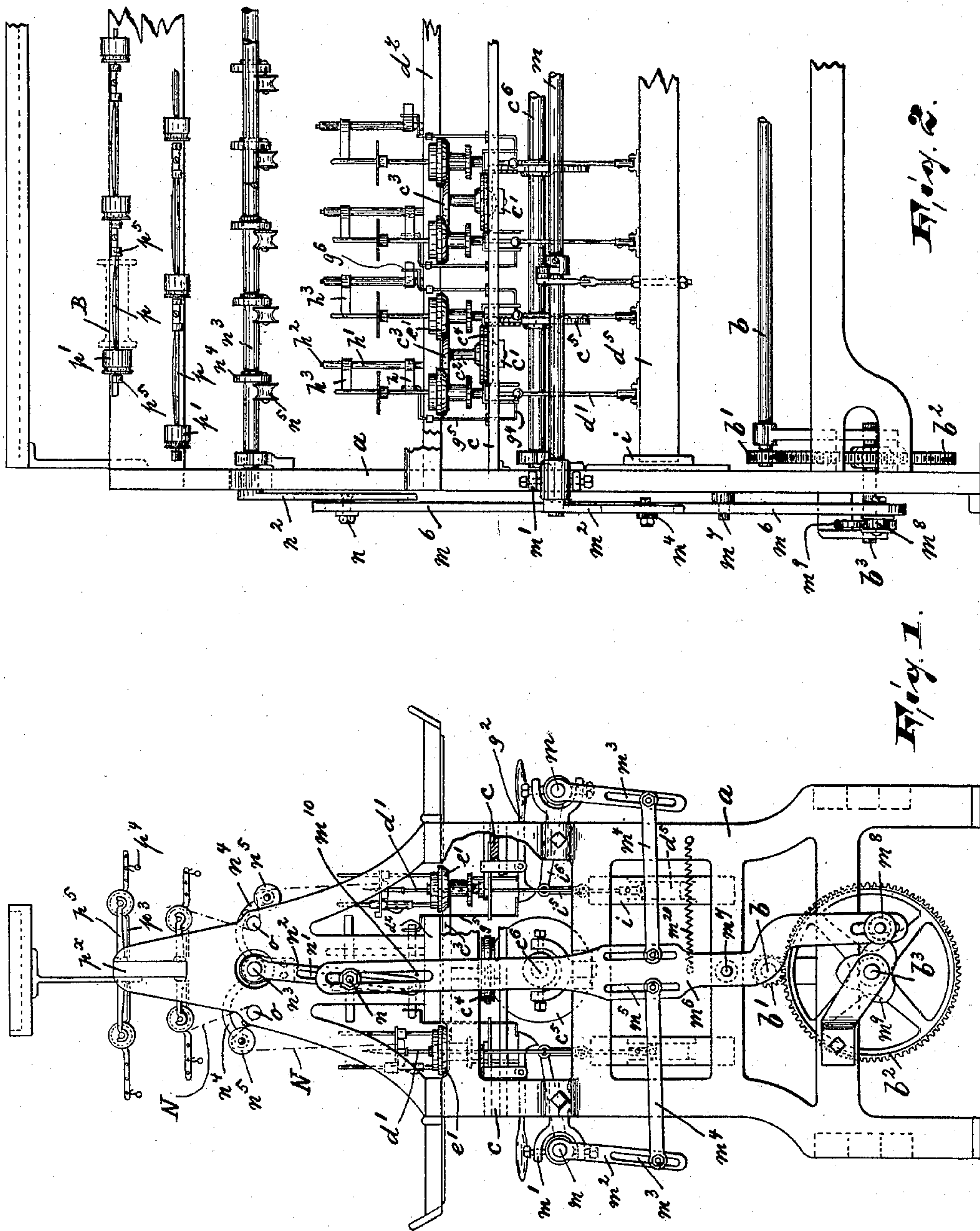
R. ATHERTON.

THREAD SPOOLING OR QUILLING MACHINE.

(Application filed Apr. 7, 1898.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES:

INVENTOR :

Wm. D. Bell.
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No. 610,162.

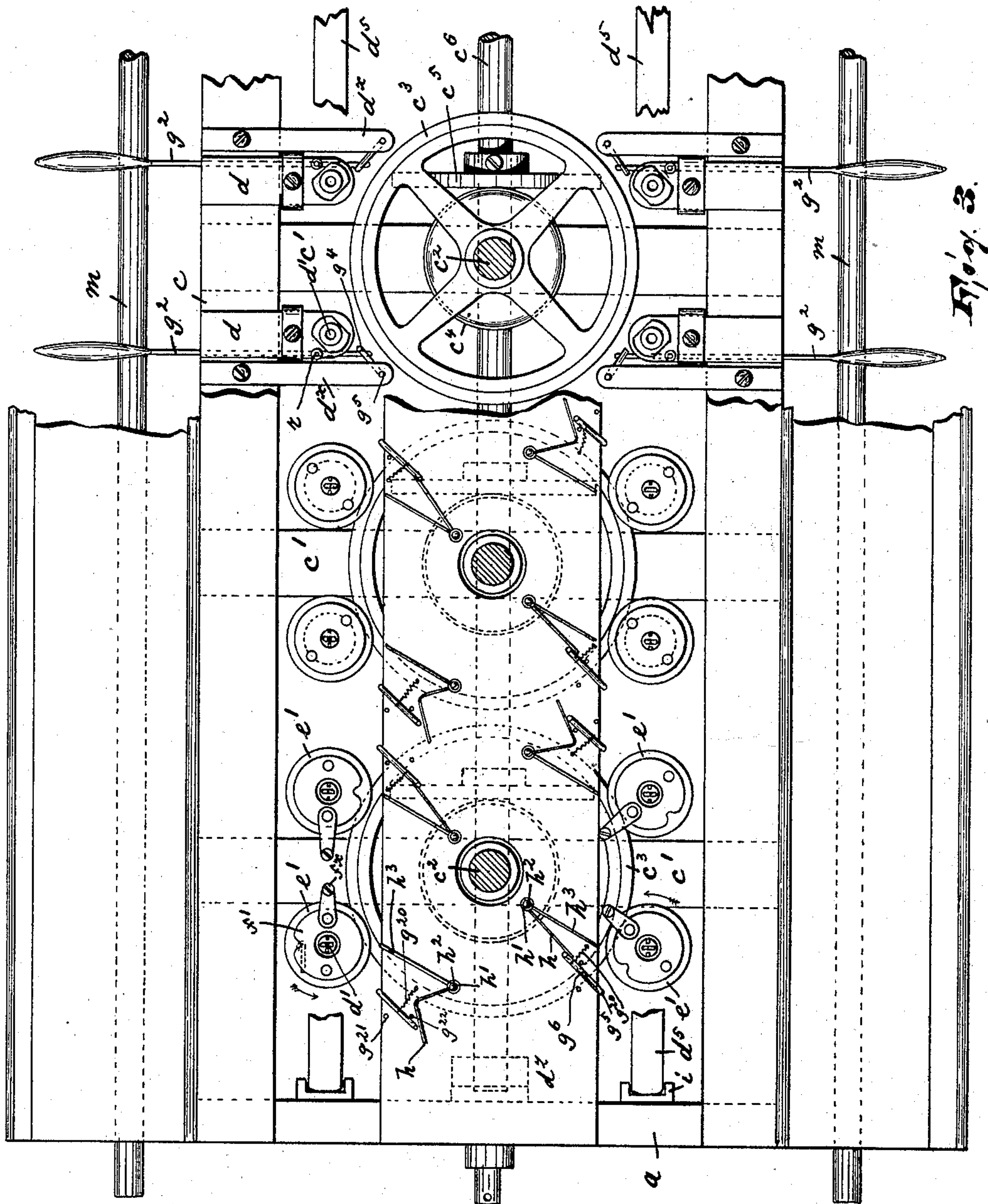
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3 Sheets—Sheet 2.



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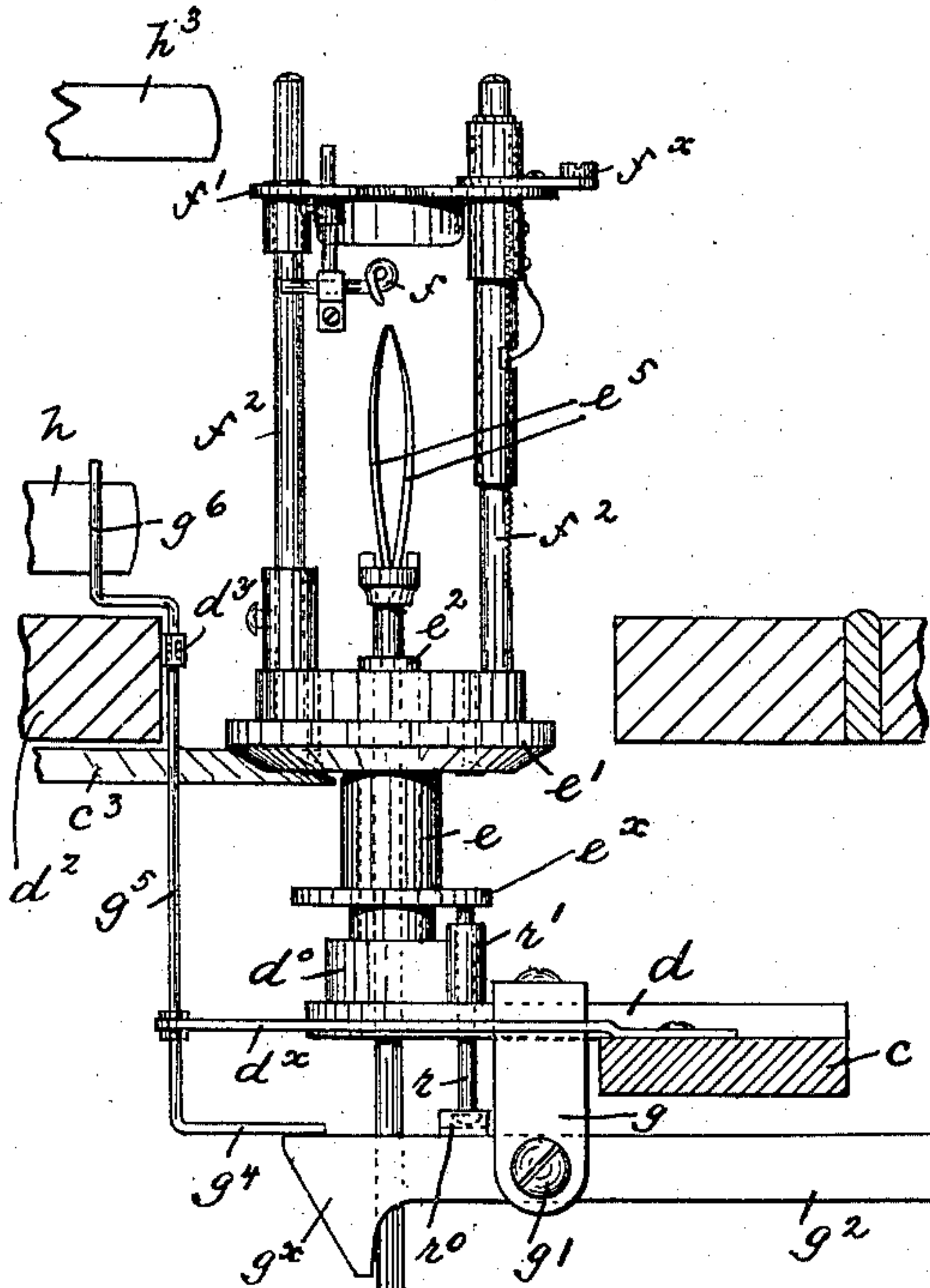


Fig. 4.

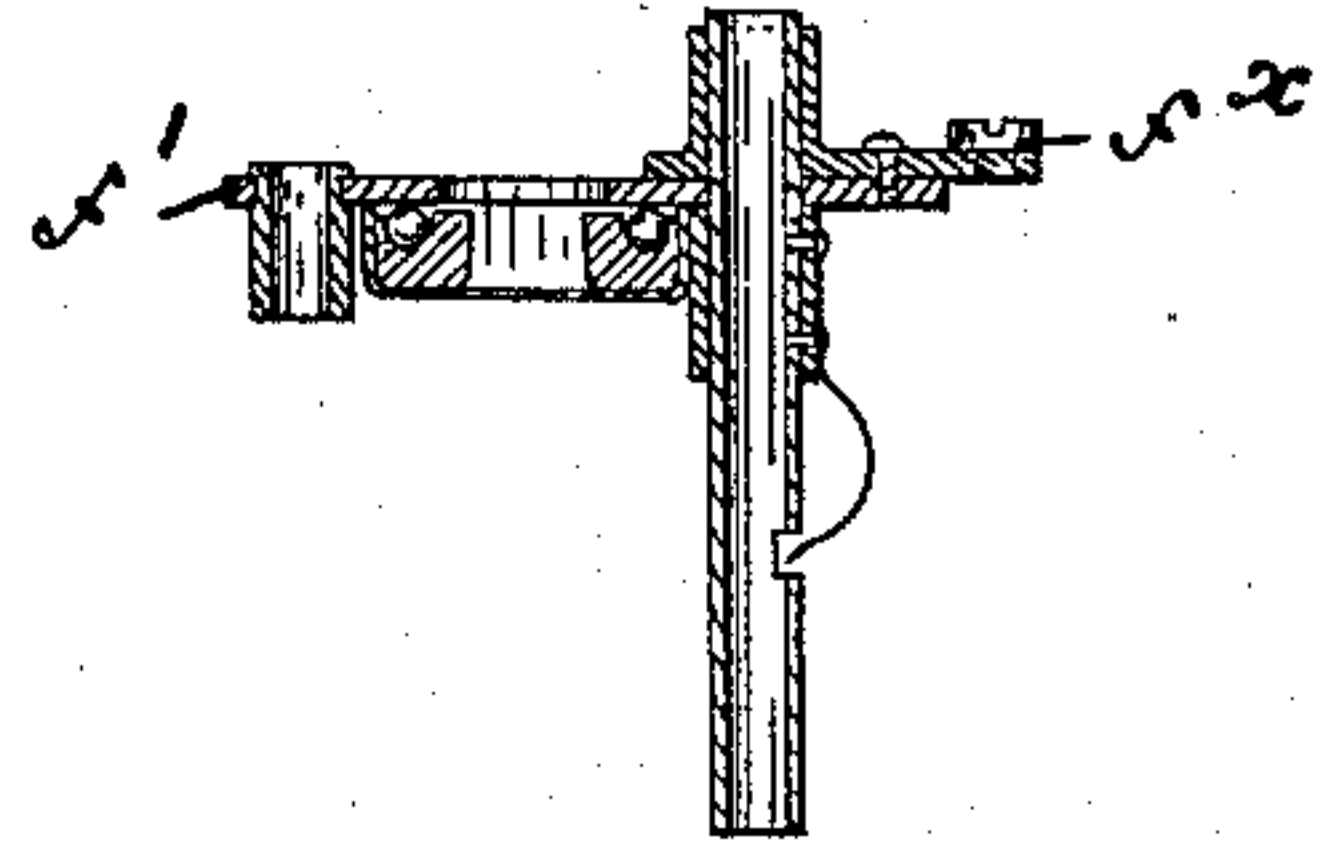


Fig. 8.

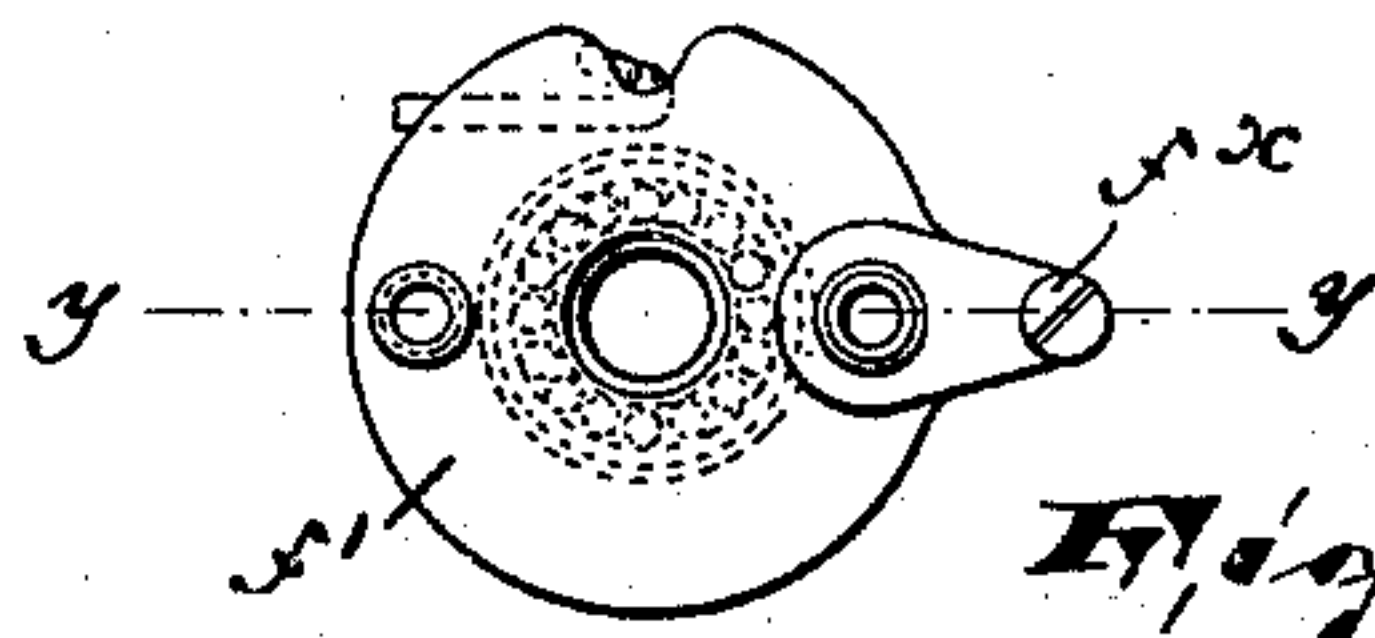


Fig. 7.

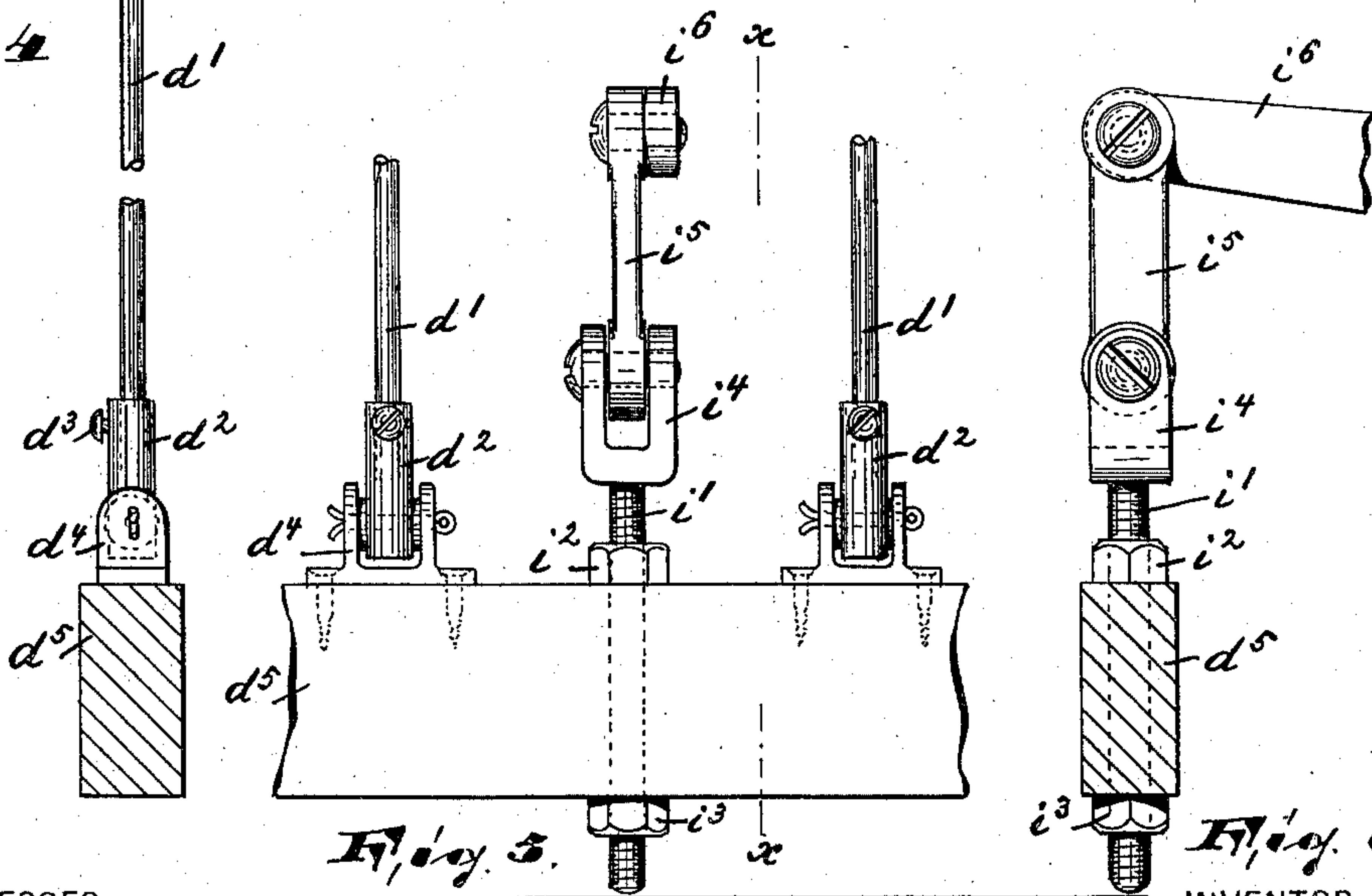


Fig. 5.

Fig. 6.

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UNITED STATES PATENT OFFICE.

ROBERT ATHERTON, OF PATERSON, NEW JERSEY.

THREAD-SPOOLING OR QUILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 610,162, dated September 6, 1898.

Application filed April 7, 1898. Serial No. 676,720. (No model.)

To all whom it may concern:

Be it known that I, ROBERT ATHERTON, a citizen of the United States, residing in Paterson, county of Passaic, and State of New Jersey, have invented certain new and useful Improvements in Thread-Spooling or Quilling Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of my present invention is to provide a quilling or weft-thread-spooling machine of simple, strong, and durable construction, reliable and effective in operation, and capable of winding cops or quills of different length in uniform and accurate conical layers.

The invention consists in the improved quilling or weft-thread-spooling machine, in its spindle and thread-guide-carrier operating and controlling means, in the tension device and its operating mechanism, in the automatic throw-out, and in the combination and arrangement of the various parts, substantially as will be hereinafter more fully described, and finally embodied in the clauses of the claim.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in each of the several views, Figure 1 is an end elevation of my improved quilling or weft-thread-spooling machine, with certain portions removed and others broken away to better illustrate the nature of my said invention; Fig. 2, a front elevation of a portion of the quilling-machine as illustrated in Fig. 1; Fig. 3, an enlarged detail top plan view of Fig. 1, the upper portion of the quilling-machine and certain operating and driving mechanism being removed; Fig. 4, an enlarged detail elevation, partly in section, of one of the spindles and its thread-guide carrier; Fig. 5, a detail front elevation of a portion of a certain vertically-reciprocating beam supporting the lower ends of the spindles; Fig. 6, a sectional view on the line $x x$ of Fig. 5; Fig. 7, a top plan view

of the thread-guide carrier illustrated in Fig. 4, and Fig. 8 a sectional view on the line $y y$ of Fig. 7.

In said drawings, a represents the frame of the quilling-machine, having suitable bearings for the main driving-shaft b , the latter transmitting its motion through a pinion b^1 and gear-wheel b^2 to a parallel shaft b^3 , supported in the frame a and below the shaft b .

The end portions of the frame a are connected on opposite sides by means of longitudinal braces $c c$, in turn connected by cross bars or bridges $c' c'$, furnishing in their central portions bearings for the vertical shafts c^2 , each of which carries at its top a beveled disk c^3 and at or near its lower end a disk c^4 , the latter in frictional contact with a vertically-arranged disk c^5 , mounted on a shaft c^6 . Said shaft is centrally arranged in the machine and is parallel with the main driving-shaft and is operated therefrom by means, such as a belt or a train of gears, arranged on the opposite end of the machine, and as not forming a part of my present invention, said driving means are not illustrated in the drawings.

To each of the braces c and at certain intervals are secured in any desired manner inwardly-projecting horizontally-arranged brackets d , each of which is penetrated by its respective spindle d' , having its lower end adjustably arranged in a sleeve d^2 by means of a set-screw d^3 , and which sleeve is pivotally secured in a bearing or bracket d^4 , mounted on the vertically-reciprocating beam d^5 .

On each spindle is revolubly mounted a sleeve e , bearing with its lower portion on a projecting lug d^6 on the bracket d and provided at its upper portion with a beveled disk e' , normally in engagement with the beveled disk c^3 on the vertically-arranged shaft c^2 .

To decrease the friction between the sleeve e and the beveled disk e' and the spindle d' , an auxiliary sleeve or bushing e^2 is interposed between the same, as clearly illustrated in Fig. 4 of the drawings.

On the top portion of each spindle d' is arranged a suitable cop or quill retaining means—such as, for instance, the curved spring-wires e^5 , Fig. 4—while a thread-guide f is carried by a disk f' , slidably arranged

on the vertical rods $f^2 f^2$. Said thread-guide carrier is substantially the same as that illustrated in United States Letters Patent No. 596,794, and as the operation of the same is identical with that in the said United States Letters Patent no further description is necessary.

To each of the brackets d is secured a downwardly-extending arm g , providing a fulcrum g' for the lever g^2 , having its longer outer arm weighted, as at g^3 , while its inner shorter arm bears against the under side of the horizontally-bent portion g^4 of a vertically-arranged rod g^5 . Said rod g^5 has suitable bearings in the arm d^x and the lug d^y , the latter projecting from a central brace d^z . The upper portion of said rod g^5 is bent into a crank g^6 , normally in the path of an arm h , mounted on a sleeve h' , revolvably arranged on the rod h^2 , secured in the central brace d^z , as clearly illustrated in Figs. 2 and 3 of the drawings. At or near the upper portion of the sleeve h' is also secured a horizontally-projecting arm h^3 , adapted, when the cop or quill is full, to be operated by the hammer or projection f^x , secured to and arranged on the thread-guide-carrying disk f' in a manner hereinafter described.

On the shorter arm of each weighted fulcrumed lever g^2 is arranged a shoe r^0 , supporting a pin r , suitably guided in a sleeve r' and bearing with its upper portion against the under side of an annular ring e^x , secured to the sleeve e , as clearly illustrated in Fig. 4.

Each of the reciprocating beams d^5 is suitably guided in brackets i , secured at opposite ends of the frame a and penetrated at or near each end by a bolt i' , adjustably arranged in the beam d^5 by means of nuts $i^2 i^3$, and carrying at its upper portion a yoke i^4 , pivotally connected through a link i^5 with the free inner end of a lever i^6 . The outer end of said lever is secured on a rocking shaft m , parallel with the main driving-shaft b and suitably mounted in brackets m' , as clearly illustrated in Figs. 1 and 2 of the drawings.

At one end of each rocking shaft m is securely mounted an arm or lever m^2 , provided with an elongated slot m^3 , in which is adjustably arranged one end of a link m^4 , the inner end of which is likewise adjustably arranged in a vertical elongated slot m^5 , provided for it in the lever m^6 . Said lever is fulcrumed, as at m^7 , to the respective end portion of the frame a and carries in its lower shorter arm an adjustably-arranged antifriction-roller m^8 in the plane of and adapted to be operated by a three-point cam m^9 , which latter is securely mounted on the revolving shaft b^3 .

The upper longer arm of the lever m^6 is provided with an elongated slot m^{10} , in which is adjustably arranged a bolt n , engaging an elongated slot n' in an arm n^2 , mounted on a rocking shaft n^3 parallel with the main driving-shaft b and in vertical alinement therewith. On the said shaft n^3 are mounted in

any desired manner arms $n^4 n^4$, each carrying at its free end a grooved pulley n^5 for a purpose hereinafter described.

On each side of the rocking shaft n^3 and parallel therewith are arranged rods $o o$, preferably of glass, designed to be engaged by the threads N , passing from their respective bobbins over the grooved tension-pulleys n^5 to thus cooperate with the latter, as hereinafter described.

The bobbins B , from which the threads are taken to be wound upon the cops or quills, are placed upon horizontal spindles p , arranged in two different planes and each provided with a grooved pulley p' in frictional engagement with the curved portion of a wire p^3 , Fig. 1, which latter is suitably fulcrumed with its inner end to the head-beam p^x and provided at its outer end with a weight p^4 , by which arrangement the speed of said spindles (mounted in open bearings p^5) is greatly reduced during the process of unwinding. It must be remarked that said speed can be changed by adjusting the weight p^4 on its respective wire p^3 , as will be manifest.

The lever m^6 is controlled by a spiral spring m^{20} , Fig. 1, while each of the vertically-arranged rods g^5 is controlled by a spiral spring g^{20} and is limited in its motion by the pins $g^{21} g^{22}$, (see Fig. 3,) adapted to be engaged by the horizontal portion of the crank end g^6 of its respective rod g^5 .

It must be stated that the weighted end of the fulcrumed lever g^2 is limited in its downward motion by the rocking shaft m , while the hook-shaped or sloping inner end g^x of said fulcrumed lever is adapted to engage with its sloping edge the horizontally-bent portion g^4 of the rod g^5 after the latter has been operated and when said lever is being returned to its normal position to thus return said rod g^5 also to its normal position.

In operation the thread N passes from its bobbin downward and under the glass rod o and over the grooved pulley n^5 and through the thread-guide f onto the cop or quill, which is mounted on the spindle d' . Said spindle does not revolve, but has a vertically-reciprocating motion imparted to it by means of the beam d^5 , which latter is operated through the link c^5 , arm or lever i^6 , rocking shaft m , link m^4 , and oscillating lever m^6 . The thread-guide carrier mounted on the beveled disk e' is rotated, together with the latter, by means of the beveled disk c^3 , and while so rotating or revolving the shaft n^3 is rocked—that is to say, the grooved pulleys n^5 exert a certain amount of tension upon their respective threads N , and thus keep the latter under a uniform strain while being wound in conical layers upon the quills or cops in a manner described in United States Letters Patent No. 596,794. Whenever the quill or cop is full, the disk f' , carrying the thread-guide f , is moved upward into the plane of the horizontally-pro-

jecting arm h^3 , which latter will then be engaged by the hammer or projection f^x and will be thrown or moved out of the path of said hammer or projection. As said arm h^3 is connected through the sleeve h' with the arm h , the latter will strike the crank portion g^6 of the spring-controlled rod g^5 and swing or turn the same until its horizontally-projecting lower portion g^4 clears the sloping inner end g^x of the fulcrumed lever g^2 . Said fulcrumed lever, by the action of its weighted end g^3 , moves or drops downward until it rests upon the rocking shaft m and through the pin r raises the disk e' out of engagement with the disk c^3 , whereby the rotation of the thread-guide carrier is immediately stopped. When the full cop or quill has been replaced by an empty one, the weighted lever g^2 is returned to its normal position, thereby bringing the disk e' into frictional contact with the disk c^3 and simultaneously returning the rod g^5 and the connected arms h h^3 (and their sleeve h') into normal and operative position, as will be manifest.

If it is desired to change the length of an individual spindle to accommodate a longer or shorter cop or quill, said spindle is simply raised or lowered and reclamped within its respective sleeve d^2 , while if it is desired to adjust the entire machine for different-sized cops or quills the said adjustment is accomplished by changing the connection between the link m^4 , the rocking arm m^2 , and the oscillating lever m^6 .

I do not intend to limit myself to the precise construction as shown and described, as various alterations can be made without changing the scope of my invention; but

What I claim as new, and desire to secure by Letters Patent, is—

1. In a thread-spooling machine, the combination with the vertically-reciprocating cop or quill carrying spindle, and with the thread-guide carrier revolubly mounted thereon, of a revolving disk in frictional contact with the thread-guide-carrier-supporting disk, a weighted fulcrumed lever carrying a pin in engagement with the disk of the thread-guide carrier, a rod or wire suitably fulcrumed and having its lower bent portion normally in engagement with the shorter arm of the fulcrumed lever, and having its upper portion crank-shaped, an arm in the path of the said crank-shaped upper portion of the wire, a revoluble sleeve carrying said arm, a second arm projecting from the upper portion of said sleeve, and means connected with the thread-guide carrier for operating said last-mentioned arm, substantially as and for the purposes described.

2. In a thread-spooling machine, the combination with the vertically-reciprocating cop or quill carrying spindle, and with the thread-guide carrier revolubly mounted thereon, of a revolving disk in frictional contact with the thread-guide-carrier-supporting disk, a weighted fulcrumed lever carrying a pin in

engagement with the disk of the thread-guide carrier, a rod or wire suitably fulcrumed and having its lower bent portion normally in engagement with the shorter arm of the fulcrumed lever, and having its upper portion crank-shaped, an arm in the path of said crank-shaped upper portion of the wire, a revoluble sleeve carrying said arm, a second arm projecting from the upper portion of said sleeve, means connected with the thread-guide carrier for operating said last-mentioned arm, and a spiral spring for controlling said fulcrumed rod or wire, substantially as and for the purposes described.

3. In a thread-spooling machine, the combination with the frame, the main driving-shaft and with the horizontal bobbin-supporting spindles arranged at opposite sides of the machine and parallel with the same, of a beveled disk revolubly mounted above the main driving-shaft and operated therefrom, a series of cop-carrying spindles on each side of the center of the machine, a thread-guide carrier revolubly mounted on each spindle and normally in frictional contact with the beveled disk, a vertically-reciprocating guided beam on each side of the machine and supporting its respective spindles, an oscillating lever fulcrumed on one end of the machine and operated from the main driving-shaft, means for adjustably connecting said oscillating lever with each of the reciprocating beams to operate the latter, a rocking shaft in the upper portion of the machine—centrally arranged and parallel with the main driving-shaft, means for adjustably connecting said rocking shaft with the oscillating lever, thread-tension devices carried by said rocking shaft, and means for automatically throwing the thread-guide-carrier-supporting disk out of operative engagement with the revolving beveled disk, substantially as and for the purposes described.

4. In a thread-spooling machine, the combination with the frame, the main driving-shaft and with the horizontal bobbin-supporting spindles arranged at opposite sides of the machine and parallel with the same, of a beveled disk revolubly mounted above the main driving-shaft and operated therefrom, a series of cop-carrying spindles on each side of the center of the machine, a thread-guide carrier revolubly mounted on each spindle and normally in frictional contact with the beveled disk, a vertically-reciprocating guided beam on each side of the machine and supporting its respective spindles, an oscillating lever fulcrumed on one end of the machine and operated from the main driving-shaft, means for adjustably connecting said oscillating lever with each of the reciprocating beams to operate the latter, a rocking shaft in the upper portion of the machine—centrally arranged and parallel with the main driving-shaft, means for adjustably connecting said rocking shaft with the oscillating lever, thread-tension devices carried by said rocking shaft,

means for automatically throwing the thread-
guide-carrier-supporting disk out of operative
engagement with the revolving beveled disk,
and means for regulating the speed of the
5 bobbin-carrying spindles, substantially as
and for the purposes described.

In testimony that I claim the foregoing I

have hereunto set my hand this 17th day of
March, 1898.

ROBERT ATHERTON.

Witnesses:

ALFRED GARTNER,
E. B. HINDLEY.