(No Model.)

# G. LAURENCY.

## CONTINUOUS SPINNING, WINDING, AND TWISTING MACHINE.

No. 580,411. Patented Apr. 13. 1897.

Fig. 1.

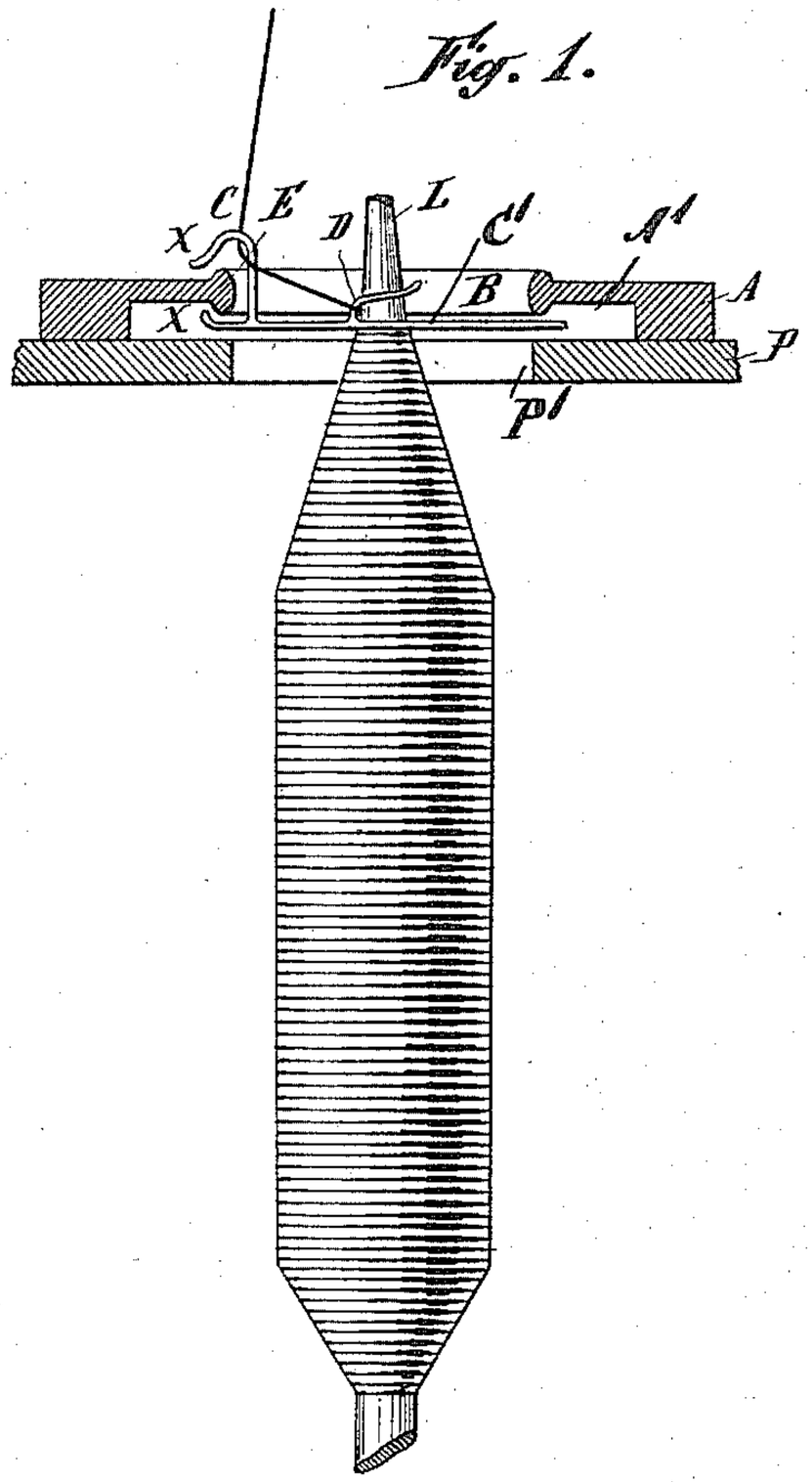
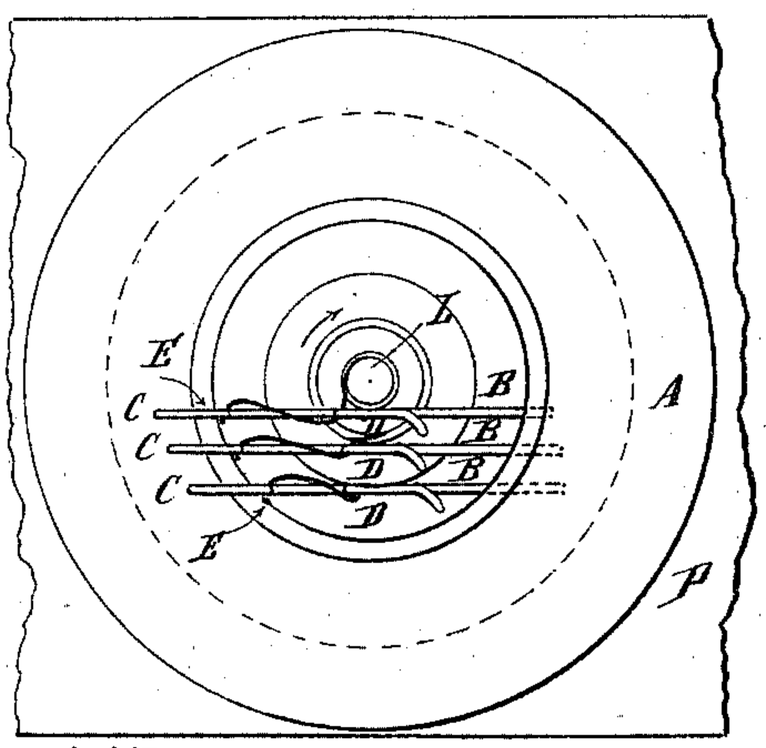



Fig. 2.




Witnesses
A. J. Haddaan
A. L. Melhuish

Fig. 3.

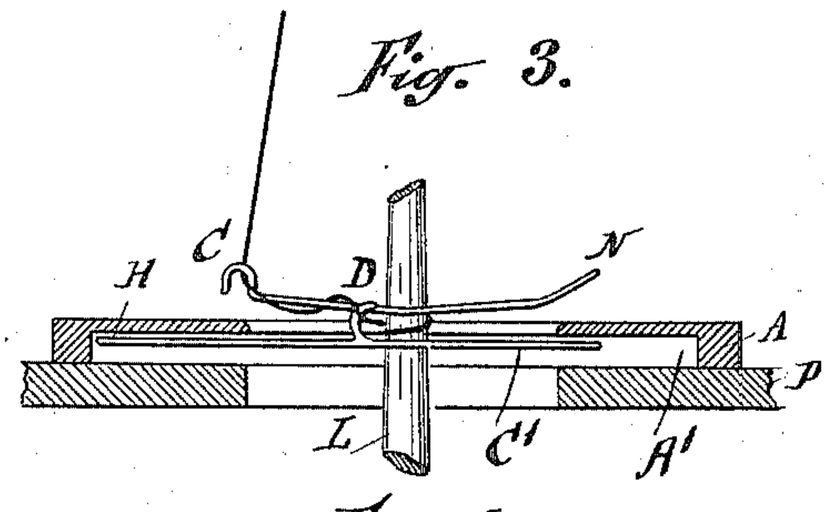



Fig. 4.

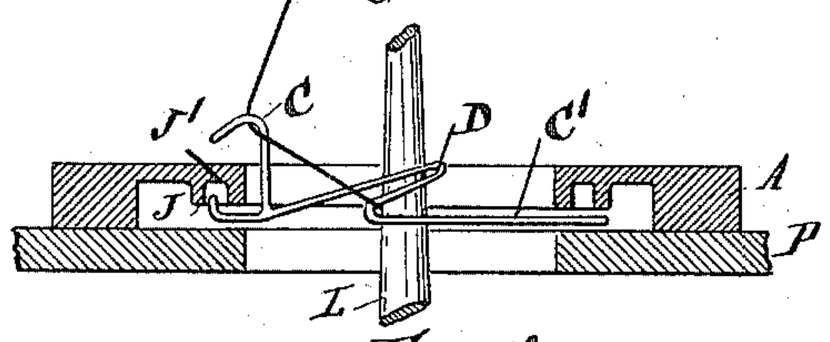



Fig. 5.

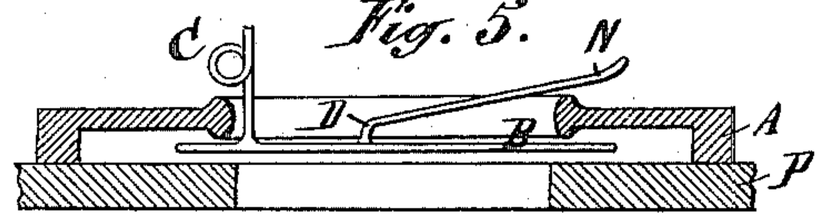



Fig. 6.

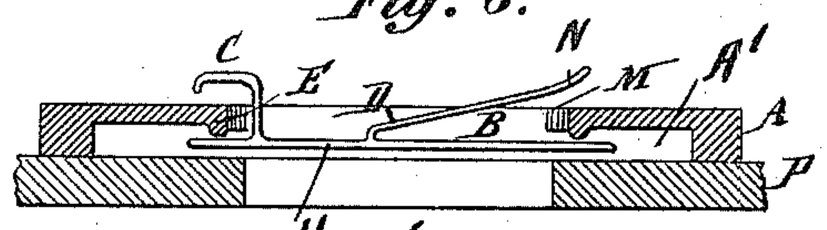
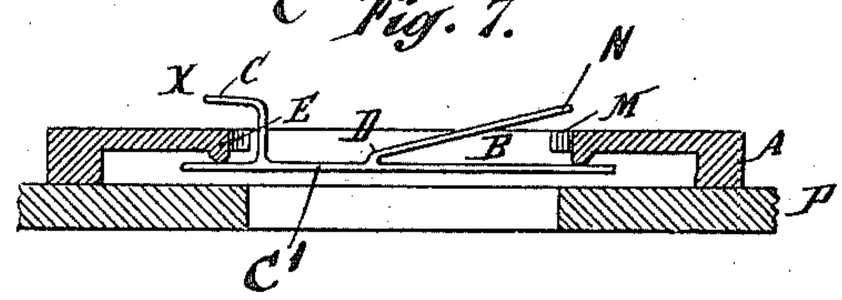



Fig. 7.




Inventor
Guillaume Laurency
by R. Haddaan
his Attorney

# UNITED STATES PATENT OFFICE.

GUILLAUME LAURENCY, OF BRUSSELS, BELGIUM.

## CONTINUOUS SPINNING, WINDING, AND TWISTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 580,411, dated April 13, 1897.

Application filed October 14, 1895. Serial No. 565,642. (No model.) Patented in Belgium November 19, 1894, No. 112,834, and July 15, 1895, No. 116,303; in Germany November 24, 1894, No. 9,646; in France November 26, 1894, No. 243,135, and in England November 30, 1894, No. 23,284.

*To all whom it may concern:*

Be it known that I, GUILLAUME LAURENCY, a subject of the King of Belgium, and a resident of Brussels, Belgium, have invented certain new and useful Improvements in Continuous Spinning, Winding, and Twisting Machines, (for which I have obtained Letters Patent in Belgium, dated November 19, 1894, No. 112,834, and July 15, 1895, No. 116,303; in France, dated November 26, 1894, No. 243,135; in England, dated November 30, 1894, No. 23,284, and in Germany, dated November 24, 1894, No. 9,646,) of which the following is a specification.

It has been generally recognized that with the continuous spinning-frame yarn cannot be wound upon a very thin spindle, as is done, for instance, in the self-acting mule, at least without giving considerable twist to such yarn, in order that it may be solid enough not to break under the tension required to carry around the traveler, this tension augmenting in proportion as the diameter on which the yarn is wound becomes reduced.

The object of the present invention is to enable this inconvenience and those which spring from it to be overcome, in order that yarns of any kind may be spun, wound, or twisted on a continuous spinning-frame with either little or great torsion, as may be required, and may be wound in any form and size of bobbin or cop whatever may be the dimensions of the spindles or pirns on which the bobbins are to be formed.

With this end in view my invention consists in the improvements illustrated in the annexed drawings, in which—

Figure 1 is an elevation of a spindle, showing a cop in process of formation, also showing part of the ring-rail in section and an improved traveler thereon. Fig. 2 is a plan view of Fig. 1. Figs. 3 to 7 are sectional views of said ring-rail, showing alternative forms of traveler on the same principle.

In order to effect the objects of this invention, it is necessary to provide means to twist and wind the yarn with a minimum tension which is constant for all diameters of winding, and this is realized by the devices hereinafter described, which have the following peculiarities: first, keeping the yarn in a direction always favorable to the movement of the traveler, whatever may be the diameter on which the winding is taking place; second, varying the resistance of the traveler; third, rendering this variation of resistance proportional to the diameter of the bobbin or cop at the place of winding; fourth, realizing the three above-mentioned conditions while making the yarn traverse an invariable circumferential path—that is to say, one that is not modified by the difference of the diameters which the cop successively presents for the winding of the yarn, although the latter is always against the cop for all diameters. For these purposes I use an improved traveler and course for guiding it.

On the ring-rail P—namely, that part which has orifices P′ for the passage of the spindles and cops and carries the devices by which the winding is effected—I place in relation to the orifice P′, through which the spindle passes, an annular plate A, having an inwardly-projecting annular flange B, so as to form between this flange B and the surface of the ring-rail P an annular recess or chamber A′ around the orifice aforesaid. This recess houses and guides the two ends of the traveler, which consists of a bar C′, adapted to lie across the orifice aforesaid with one of its ends in the recess A′ at one side and the other end in the recess A′ at the other side. This bar C′ carries two hooks D and C, the former at about the center of its length and so placed that the tension on the yarn passing through it and drawn from it is directed in a line passing through the center of gravity of the traveler, the latter hook C near to that end of the traveler which is the leading end when the traveler is in motion. The latter hook C or its shank is adapted to bear against the face of the flange B—that is to say, against the wall of the orifice P′—and it consequently constitutes an abutment for the traveler, and to a certain extent also it performs the function of a brake or drag and of a pivot on which the traveler may turn. The yarn passes first to the hook C, thence to hook D, and thence to the spindle. When winding is taking place on the spindle itself

or on the smallest diameter of the cop, the traveler stands almost diametrically across the orifice P′, and the pressure of the outer hook C against the flange B is then least, so that in this position there is the least resistance to the rotation of the traveler about the spindle, but as the diameter of winding grows the traveler is displaced from the first position, Fig. 2, to the second or third position, and in proportion as it is displaced so the length of the chord of the circle of orifice P′ with which it coincides shortens. The hook C having bearing at one end of the chord the hook D becomes displaced more and more to one side of the center line—namely, the line passing through the axis of the spindle perpendicular to the line of extension of the traveler. This decreases the angle of the bend in the yarn around the hook D, and consequently increases the drag on the yarn, giving thus an increased pressure of the outer hook C against the circular wall along which it moves. The resistance of the traveler is thus proportional to the diameter of winding.

The thread draws the traveler by its center of gravity—that is to say, at the middle point of its total weight. This point is also that at which is concentrated the effort produced by centrifugal force. It is evident that this force which tends to throw the traveler away from the cop can be entirely overcome by the tension of the thread which draws the traveler toward the center axis of the cop. It is obvious, therefore, that it is desirable for the traveler to be able to rock on its axis, so as to lie closely to the surface of the cop, and it will be observed that the traveler illustrated is quite capable of such rocking movement without in any way altering the conditions under which it has frictional contact in the ring.

The flange B may be made with a thickened or rounded edge, as at E, Fig. 1, in order to have better control over the frictional resistance to the movement of the traveler which results from upward pull thereon by the tension of the yarn.

In place of making the hook C abut against the inside edge of the flange B, as in Figs. 1, 5, 6, and 7, the leading end of the traveler-bar C′ may itself have abutment with the vertical wall within the recess A′ aforesaid, as in Fig. 3 at H, or in place of that the said end may be bent up, as at J, Fig. 4, to run in a groove, as J′, formed between two concentric ribs on the under side of flange B. By extending the hook D, as at N, parallel to or in the direction of the end of the traveler remote from its abutment the balance of the traveler under centrifugal action may be modified.

The traveler may be made of steel or aluminium-bronze wire of any section. The plate A may be metal, glass, or other material. The coefficient of friction between the hook C or its equivalent abutment on the traveler and the annular wall against which it moves may be increased by use of leather facings or equivalent material, as at M, on the one or other of these parts.

I do not claim, broadly, a traveler consisting of a wire with hooks one near the middle and one near one end and moving in an annular groove, but

I claim—

The combination with a spindle of a ring-rail, a ring thereon constituting an annular groove and a traveler consisting of a single straight bar adapted to extend across the orifice in the ring-rail and engage with its leading and trailing ends in the annular groove, with a hook on said bar at the center of gravity of said traveler and a hook forward of the former hook in direction of the leading end of the said traveler, the traveler being adapted to rock on its longitudinal axis and to have frictionally-resistant contact at its leading end with the ring whereby its center hook is displaced rearward of the line through the spindle-center perpendicular to the bar of the traveler for a distance proportional to the diameter of the cop on which winding is taking place and may incline toward the cone of said cop for the purposes set forth.

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

GUILLAUME LAURENCY.

Witnesses:
GEORGE BEDE,
GREGORY PHELAN.