N. WYLLYS.

DRAWING REGULATOR FOR SPINNING.

No. 7,919. Patented Jan. 28, 1851.

Fig. 2

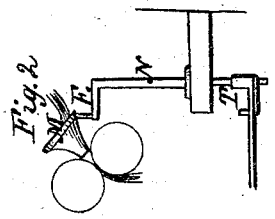
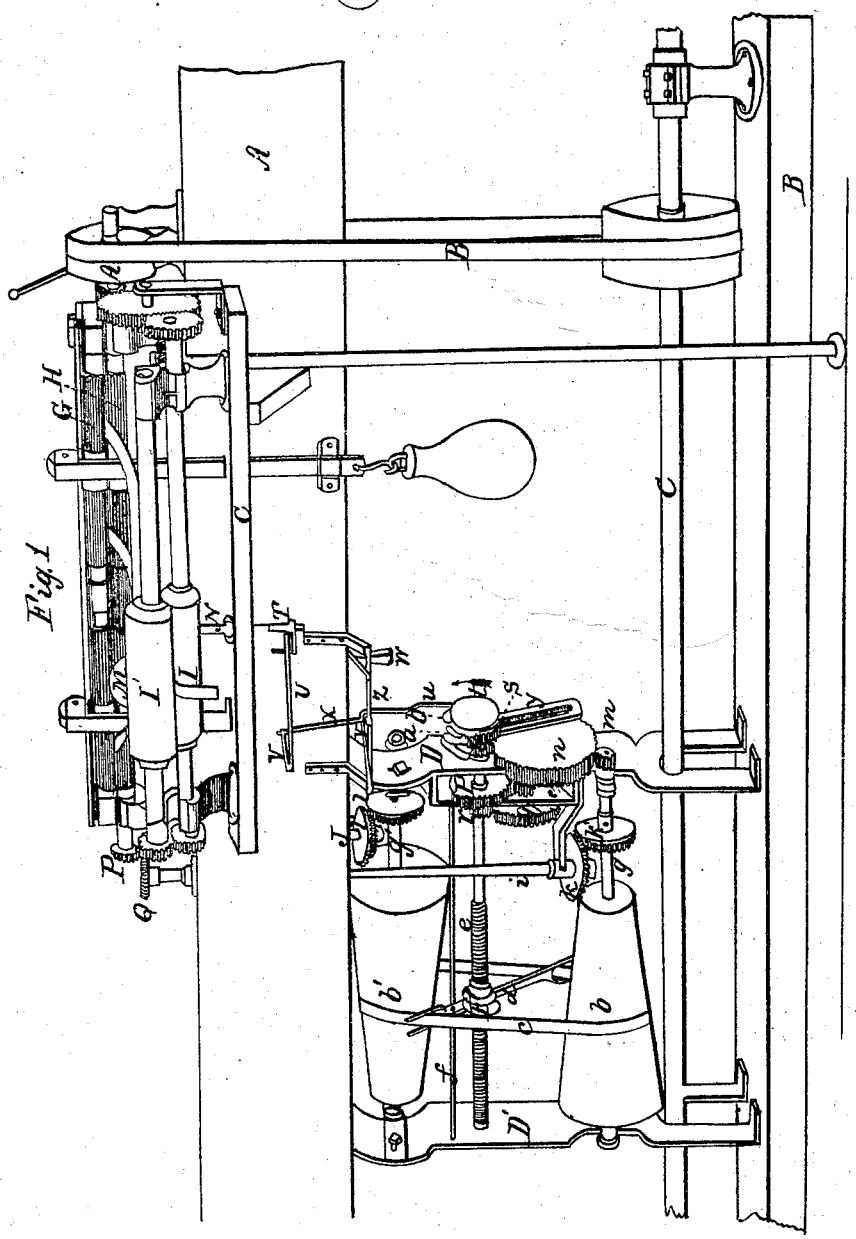


Fig. 1



UNITED STATES PATENT OFFICE.

N. WYLLYS, OF SOUTH GLASTENBURY, CONNECTICUT.

DRAWING-REGULATOR FOR SPINNING-MACHINES.

Specification of Letters Patent No. 7,919, dated January 28, 1851.

To all whom it may concern:

Be it known that I, NEWELL WYLLYS, of South Glastenbury, in the county of Hartford and State of Connecticut, have invented a new and useful Improvement in the Method of Regulating the Speed of Drawing-Rolls by the Size of the Sliver; and I do hereby declare that the following is a full, clear, and exact description of my invention, reference being had to the accompanying drawing which forms part of this specification, and in which—

Figure No. 1 represents a view in perspective of my improved drawing regulator and of the parts of the drawing frame with which it is connected and Fig. No. 2 is a vertical section through the calender roll board.

Experience has demonstrated that in those drawing heads in which the draw of the sliver is regulated by the size of the sliver itself the relative speeds of the several pairs of rollers by which the drawing is effected should not be changed with too great facility by slight and short inequalities in the size of the sliver, because the tendency of this over-sensitiveness is to cause an almost incessant variation in the speeds of the drawing rollers and to produce an irregular sliver composed of a series of alternate swells and contractions. To obviate this defect and at the same time to insure a sufficient degree of sensitiveness in the mechanism for regulating the draw so as to produce a sliver of uniform size is the object of my invention, which consists in such an arrangement of mechanism in connection with the condensing tube or trumpet that when the sliver is of the proper size the trumpet occupies a certain neutral position in which the force exerted by the weight to move the trumpet in one direction and that exerted by the sliver to move it in the opposite direction balance each other, and whenever the sliver is too thick the former force preponderates, the trumpet is moved in advance of its neutral position, the effective length of the lever through which it acts is diminished, and the weight tends to return the trumpet to its neutral position with correspondingly increased force; whenever the sliver is drawn too thin, the force of the weight preponderates over that exerted by the sliver, the trumpet is moved back of its neutral position, the effective length of the lever through which it acts is increased, and consequently the sliver tends to return the trumpet to its neutral position with correspondingly increased force.

In the accompanying drawing A is the roller-beam of the drawing frame on which the drawing rolls are mounted, H being the bottom or fluted rollers and G the top rollers. The shaft of the foremost, or fastest running, bottom roller is fitted with a loose and with a fast pulley A, to which motion is imparted by means of a belt B from a pulley on a countershaft C beneath. In front of the roller beam A is the calender roll board C on which the calender rollers I, I′, are mounted, motion is impatred to the lower one of these rollers from the shaft of the bottom drawing roller through the intervention of three cog wheels while the upper calender roller is put in motion by the lower through the intervention of a pair of pinions which are secured to their respective shafts. The two back pairs of drawing rolls are driven from the shaft of the bottom roller H of the front pair in the following manner. An upright shaft *i* is supported in suitable boxes on the drawing frame and is furnished at each extremity with a bevelled wheel, the wheel Q at the upper extremity of the shaft gears into a beveled pinion P on the shaft of the front bottom drawing roller H, while that *k* at the lower extremity gears into a beveled wheel *k′* on a horizontal shaft *g* whose journal boxes are supported by standards D D′ which extend from the foot beam B to the roller beam A of the drawing frame. A second horizontal shaft *g′* is supported in suitable boxes above the first one (*g*) and the two are fitted with reversed cone pulleys *b b′* to which a belt *c* is adapted. The second shaft (*g′*) is also fitted with a beveled wheel *l* which gears into a similar one *l′* on the lower end of an upright shaft *j* whose upper extremity is fitted with a beveled pinion which gears into a wheel on the hindermost bottom drawing roller. The intermediate drawing rolls are driven from the hindermost pair through intervention of cog wheels secured to their respective shafts.

This whole system of wheels, shafts belt and cone pulleys is such that as the front bottom roller H revolves it puts in motion the cone pulley *b* through the intervention of the upright shaft *i*, and this pulley act-

ing upon the belt *c* drives the other cone pulley *b'* which puts in motion the hindermost bottom drawing roller through the intervention of the upright shaft *j*. As the pulleys are reversed cones the shifting of the belt *c* along their barrels will cause the driven pulley *g'* to revolve faster or slower than the driving pulley *g;* and consequently the hindermost bottom drawing roller will be driven faster or slower as the belt is shifted in one direction or the other. If it revolves faster while the speed of the front rolls is unchanged, the sliver will be less drawn between the rollers and will be delivered from the front rollers thicker than before the change of speed; while if the belt be shifted to cause the hinder rolls to revolve more slowly, the sliver will be more drawn out and will be delivered thinner than before the change of speed. In order to effect the shifting of the belt *c* by a variation in the size of the united slivers passing through the trumpet M the latter is pivoted to the outer extremity of an arm E which projects from a short upright shaft T, this shaft is supported in a tubular stand N and is fitted at its lower extremity with a second arm U. The latter is connected by a rod *v* with an arm projected upward from a horizontal shaft Z to which a second arm is fitted whose outer extremity is connected by a rod *w* with an escapement disk *t*. This disk is fitted to turn freely upon the shaft of a screw *e* which is also fitted with a loose sleeve on which a toothed wheel *s* is secured whose teeth are acted upon by a reversed pair of pawls *a b*. The sleeve is fitted with a cog wheel P which gears into a pinion on a short countershaft beneath, and the latter is fitted with a cog-wheel *q* which gears into a pinion *r* secured to the shaft of the screw *e* so that as the sleeve is turned in one direction or the other the screw *e* will be turned through the intervention of the cog-gear in the same direction but with a faster speed. These pawls are pivoted to the upper extremity of a lever *y* which being hung loosely upon the screw shaft is caused to vibrate incessantly by a crank pin projected from a cog-wheel *n* to which motion is imparted by a pinion *m* on the shaft *g*.. The periphery of the disk is perforated at its opposite sides with slots; these are at such distances apart that when the disk is in such a position that the upper extremities of the slots are at equal distances on each side of a vertical line passing through the center of the screw the edges of both the pawls will be supported on the solid portion of the periphery of the disk which is between the two slots; when the disk is turned by the rod *u* in the direction indicated by the arrow in the drawing the solid portion between the two slots will be moved forward, the hinder slot will be raised and the hinder pawl *b* falling through the slot will engage with the teeth of the wheel *s* and turn it as the lever *y* vibrates. When the portion of the disk is reversed the front pawl *a* is brought into gear while the hinder one is thrown out and hence the wheel *s*, the sleeve to which it is secured, and the screw *e* will be turned in the opposite direction. The disk therefore acts as an escapement to keep the screw at rest or to allow it to be turned in either direction according to the position in which it is placed. The screw *e* is fitted with a box F to which a double forked bar *d* is secured whose forks embrace the two members of the belt *c*, hence as this box is moved along by the turning of the screw the belt will be shifted in its position upon the cone pulleys and will consequently cause the driven one and the hinder drawing rollers connected therewith to revolve at a speed different from that at which they moved before the screw was turned. When the disk *t* is in a central position both pawls are out of gear with the toothed wheel *s* and hence the belt will be retained in its position, while as the position of the disk is governed by that of the trumpet M with which it is connected by the system of devices above described it follows that any movement of the trumpet from its mean position will be followed by a variation in the position of the belt *c* and consequently by a variation in the speed of the hinder drawing rolls. The opening in the trumpet is of such size that when the united slivers are of the proper size the friction exerted by them in passing forward through the opening shall be just sufficient to maintain the trumpet in a mean position against the force exerted by a weight W which tends to move the trumpet backward. If therefore the united slivers passing through the trumpet be too large the friction will be increased, the trumpet will be moved toward the calender rolls and the escapement disk (*t*) being correspondingly moved will allow the front pawl to turn the screw (*e*), thereby moving the belt (*c*) toward the larger end of the driven cone (*g'*) by which operation the speed of the hinder drawing rolls is diminished, the separate slivers are drawn thinner and consequently the whole when united will be smaller and will pass more easily through the trumpet; the latter will then be returned by means of the weight W to its mean position and will move the escapement disk correspondingly to throw the pawls out of gear. If however the united slivers be too small the friction exerted upon the trumpet will be too little to maintain it in its mean position against the action of the weight (W), consequently the trumpet will be moved toward the drawing rolls, the escapement disk being corre-

spondingly moved will allow the hinder pawl to act, and the screw will be turned to shift the belt toward the smaller end of the driven cone by which means the hinder drawing rolls will be driven faster, the separate slivers will be less drawn, and the size of the whole when united will be increased; they will then exert more friction in passing through the trumpet which will therefore be restored to its mean position, when the further change of speed will be stopped as the escapement disk will also have arrived at its mean position in which both pawls are raised out of gear with the teeth of the wheel on the sleeve.

It will be perceived that any knot or hard lump passing through the trumpet will change its position only for a moment and not long enough to affect the speed of the drawing rolls, this property of my apparatus is one cause of its superiority over those previously constructed, which in such an event would increase the speed of the back rollers so materially that the sliver would be materially diminished in size for some distance after the knot had passed. It will be perceived that as my trumpet is mounted upon an arm E projecting from a shaft T any change in the position of the trumpet will change the effective length of the lever or arm through which it acts; when this arm is nearest the drawing rolls the line passing through its center is nearly parallel with the drawing rolls and the effective length of the lever is greatest, while as it moves toward the calender rolls it is brought more nearly at right angles to its first position and its effective length is diminished, hence it follows that the nearer the trumpet approaches the calendar rolls the greater will be the power required to move it and this arrangement prevents those sudden alterations and vibrations of the trumpet and consequent incessant variations in the speed of the drawing rollers for which self regulating drawing heads have heretofore been remarkable. This property of my invention is therefore of great value in practice as the evenness of the sliver is increased thereby.

What I claim as my invention and desire to secure by Letters Patent is—

The arrangement of the trumpet as herein described in connection with the system of weighted levers, escapement and reversed cone pulleys, whereby the force required to move the trumpet is made to vary under different circumstances to a sufficient extent to prevent oversensitiveness, in the mechanism which changes the relative speeds of the drawing rolls, to inequalities in the slivers while at the same time but little force is required to effect such changes, thus proportioning the draw more nearly than heretofore to the quantity of fiber in the sliver and thereby rendering the latter of more uniform diameter and density.

In testimony whereof I have hereunto subscribed my name.

NEWELL WYLLYS.

Witnesses:
P. H. Watson,
Wm. D. Washington.