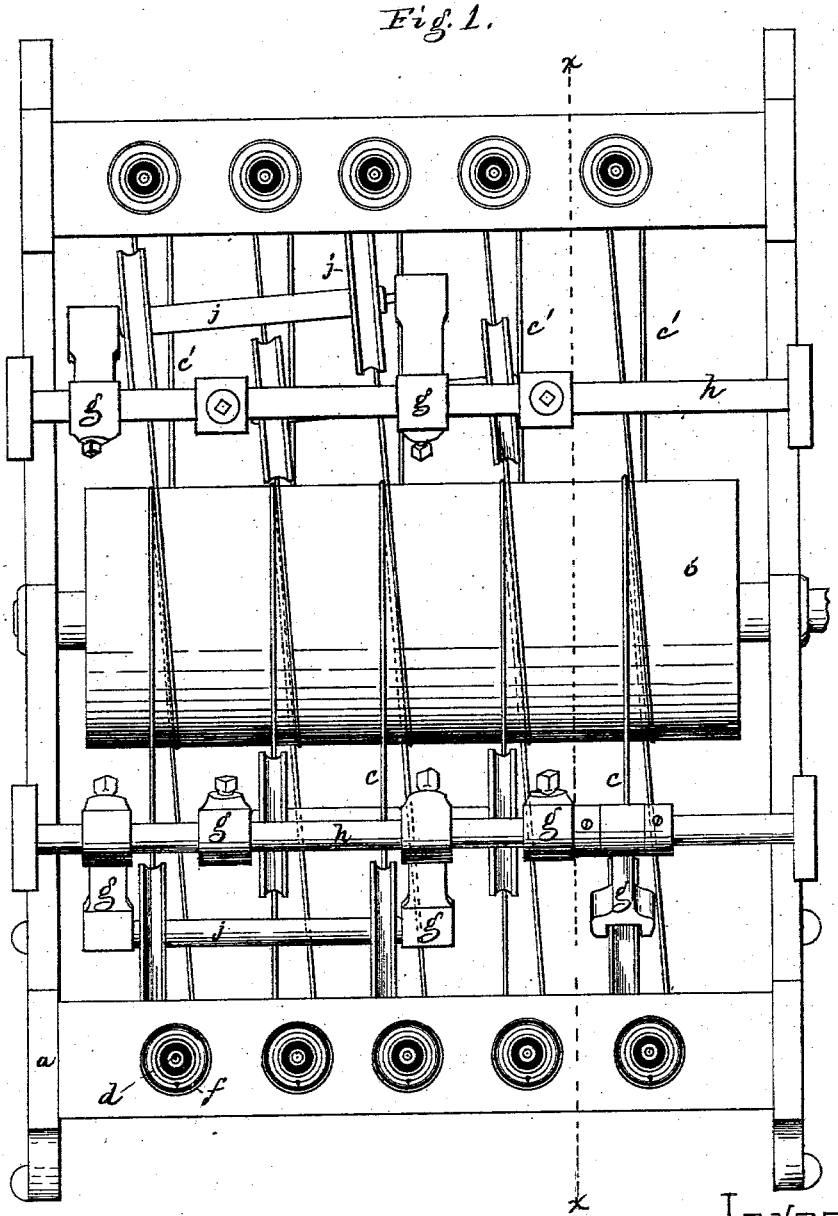
2 Sheets—Sheet 1.

G. DRAPER.

TENSION-REGULATORS FOR SPINDLE-DRIVING BANDS.

No. 186,326. Patented Jan. 16, 1877.

Fig. 1.



Witnesses.
L. H. Latimer.
W. J. Pratt.

Inventor.
George Draper.
per Crosby & Gregory Attys

2 Sheets—Sheet 2.

G. DRAPER.

TENSION-REGULATORS FOR SPINDLE-DRIVING BANDS.

No. 186,326. Patented Jan. 16, 1877.

Fig. 5

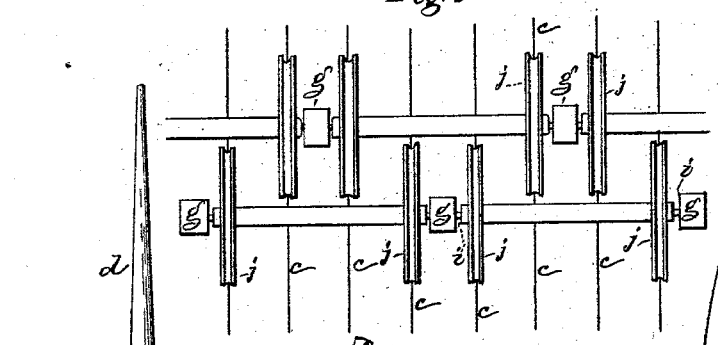


Fig. 3.

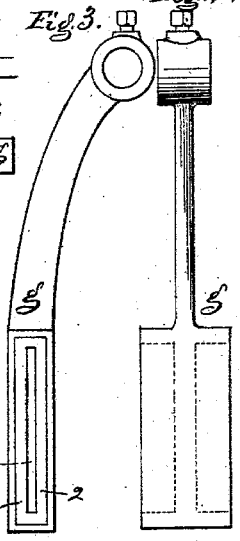


Fig. 4.

Fig. 2.

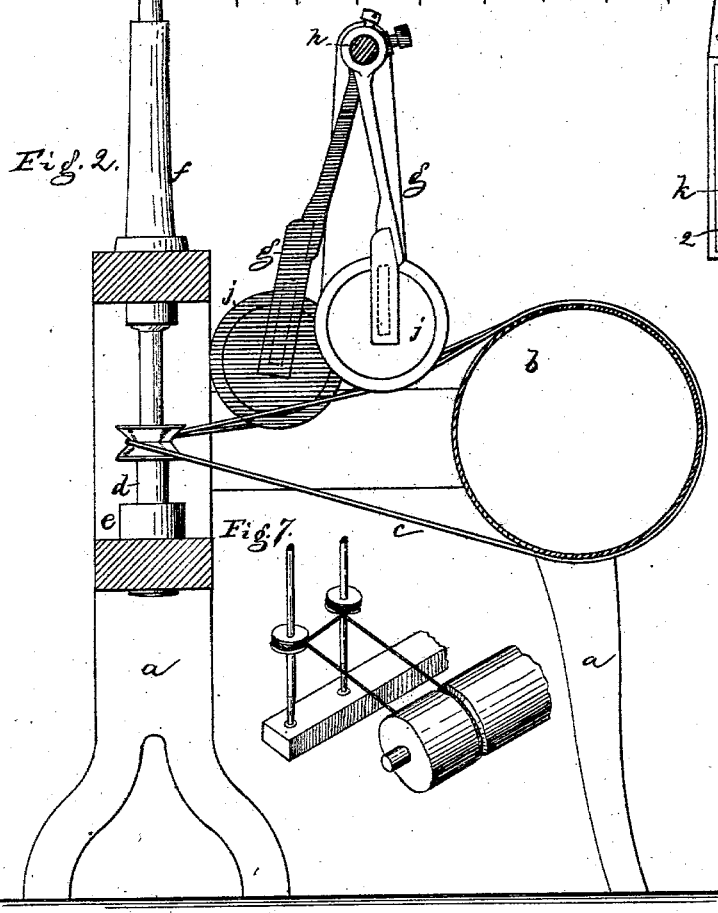


Fig. 7.

Fig. 6.

Witnesses.

L. H. Latimer.

W. J. Pratt.

Inventor.

George Draper

per Crosby & Gregory, Attys.

UNITED STATES PATENT OFFICE.

GEORGE DRAPER, OF HOPEDALE, MASSACHUSETTS.

IMPROVEMENT IN TENSION-REGULATORS FOR SPINDLE-DRIVING BANDS.

Specification forming part of Letters Patent No. **186,326**, dated January 16, 1877; application filed October 2, 1876.

To all whom it may concern:

Be it known that I, GEORGE DRAPER, of Hopedale, in the county of Worcester and State of Massachusetts, have invented an Improvement in Tension-Regulators for Spindle-Driving Bands, of which the following is a specification:

This invention relates to devices for regulating the tension on the spindle-driving bands, in connection with spinning frames or machinery, the object of the invention being to secure an even tension at all times upon each band, the tension being sufficient in amount to drive the spindle without liability of the band slipping, and not so great as to cause the expenditure of unnecessary power to drive the spindle, as is the case when the spindle-bands are too tight. In ordinary ring-spinning frames each spindle is driven by a separate band. The ordinary banding used is of such nature that it expands and contracts according to the state of the atmosphere, and, as applied, is apt to become loose from other causes.

When a band is too loose, the yarn spun upon the spindle driven by it is spoiled, and this being well known, the operators, in adjusting the bands, always aim to put them on sufficiently tight to drive the spindles without slippage, and in so doing they commonly band the spindles too tight, which is also a serious evil, for thereby much more power is required to drive the spindles, and the spindles, bolsters, and steps are worn out much more rapidly, and it is necessary to lubricate the spindles and bearings oftener, to keep them in condition to run properly for the formation of good yarn.

I have discovered, by experiment, that a lateral pull of about two pounds on each spindle is about the force which each band should exert to properly drive the spindle of an ordinary ring-frame. I have also ascertained that it is not uncommon in putting on new bands to put them on sufficiently tight to exert a lateral pull of from eight to ten pounds upon each spindle, and that the average lateral pull of most of the bands now running is not less than from four to five pounds on each spindle, or more than twice the amount substantially necessary to properly drive them.

In this invention I arrange above the bands suitable stands or guides to keep in place the tension regulators or adjusters, causing them to bear upon the bands, and resting thereon, they are moved by the bands. These tension-regulators press upon the bands with sufficient force to give to each band substantially the amount of lateral pull necessary to properly drive the spindles at all times.

Figure 1 represents a top view of part of a spinning-frame, illustrating the application of my invention thereto, the two opposite sides of the frame being shown merely to indicate the exact position of the parts at both sides of the frame. Fig. 2 is a vertical section on line *x x*, Fig. 1. Figs. 3 and 4 are edge and front views of the guides or stands. Fig. 5 is a detail, showing the tension-regulators applied as I prefer to apply them; Fig. 6, a modification of tension-regulator; and Fig. 7 is a modified form of band.

In the drawing, the frame *a*, spindle-driving drum *b*, bands *c*, spindles *d*, foot-steps *e*, and bolsters *f* are or may be of any usual construction. Each spindle is, or it may be two adjacent spindles are, driven by an independent band, *c*. Above the line of bands I place a series of guides or stands, *g*, attached, preferably adjustably, in any suitable manner, to a support, *h*, which, in this instance, is a rod adapted to extend across the frame near its upper part. The lower ends of these guides or stands are slotted, as seen at Fig. 3, to receive the (preferably small) steel pivots or ends *i* of the spool-like tension-regulators *j*, composed preferably of two annularly-grooved heads connected by an axle. These tension-regulators are preferably made of wood, and the heads are separated far enough to permit the regulator to extend over one or two bands, preferably two, for one stand can thus support the ends of two regulators. The edges of the guides or stands will preferably be supplied with bearing portions *k*, of wood, rawhide, or equivalent material, to avoid lubricating the pivots turning in contact with the portions 2 2 of the bearing portions.

In Fig. 1 the upper portions of the band *c* are shown as extending from the drum to the spindle in substantially a straight line, while the lower portions are oblique to the drum; but similar bands (marked *c'*) on the other side

of the frame, and driven by the drum, would run with their oblique portions extending from the top of the drum instead of the bottom.

The tension-regulators in Fig. 1 extend over one band, each regulator resting on two bands. The axle of the tension regulator or adjuster should be at right angles to the portions of the bands upon which the heads rest as the bands run, and, consequently, the tension-adjusters at one side of the frame will occupy a position oblique to the axis of the drum *b*. The stands *g* are made adjustable on the rod *h*, to provide for this change of position, (see Fig. 1,) or they may be otherwise suitably held.

In Fig. 5 I show a detail of banding, with tension-adjusters applied and extended over two bands, and in such case one stand, slotted at its opposite edges, as in Fig. 4, will act to guide the pivots at the adjacent ends of two tension-adjusters. The annular-grooved heads of the tension-adjusters rest upon and turn with the bands, the guides or stands preventing them from moving forward or backward. Besides keeping the bands at their proper tension, the bands, by this plan, may be made to draw more upon the wharves at their smallest portions. Instead of bearing on the upper portion of the bands, the adjusters may be pressed or borne upward against the lower portions of the bands; but I prefer to have them rest upon the bands by simply their own weight. Instead of having tension-adjusters with two heads or disks, I may employ them having but one head, as shown in Fig. 6, and at right of Fig. 1. In Fig. 7 I show a form of banding in which one band drives two adjacent spindles. My tension adjusters or regulators are equally applicable to this form of band.

A tension-regulator adapted to bear upon two bands simultaneously acts to equalize the power applied to the two different spindles, in case more power is required to drive one than the other; or, in case one band has a tendency to move faster than the other, the regulator will act to equalize their speeds.

By constructing the regulator in this way it is possible to decrease the number of regulators, stands, and pivots one-half.

I am aware that what are called "binders" or "tighteners" are in common use on belts, and that they are also employed to take up long bands for driving-spindles and other parts of machinery; but such binders have bearings in boxes requiring lubrication, which would render them useless for my purpose, while my tension-regulators are loosely held, running in slots in stands or supports so constructed as to render lubrication unnecessary.

I claim—

1. In a spinning-frame provided with separate bands, as described, to connect one or two spindles and the spindle-driving drum, the combination, with the bands, of independent rotating loosely-held tension regulators or adjusters, adapted to bear against and turn with the bands, substantially as and for the purpose described.

2. The adjustable stands or guides, each slotted on two faces, as set forth, in combination with the tension regulators or adjusters, adapted to operate upon the bands, substantially as described.

3. The combination, with two independent bands, of a single tension regulator adapted to ride upon both bands, substantially as described.

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

GEORGE DRAPER.

Witnesses:

G. W. GREGORY,

W. J. PRATT.

2