

W. F. DRAPER.
Device for Indicating Tension in the Adjustment of
Spindle-Bands.

No. 220,587.

Patented Oct. 14, 1879.

Fig:1.

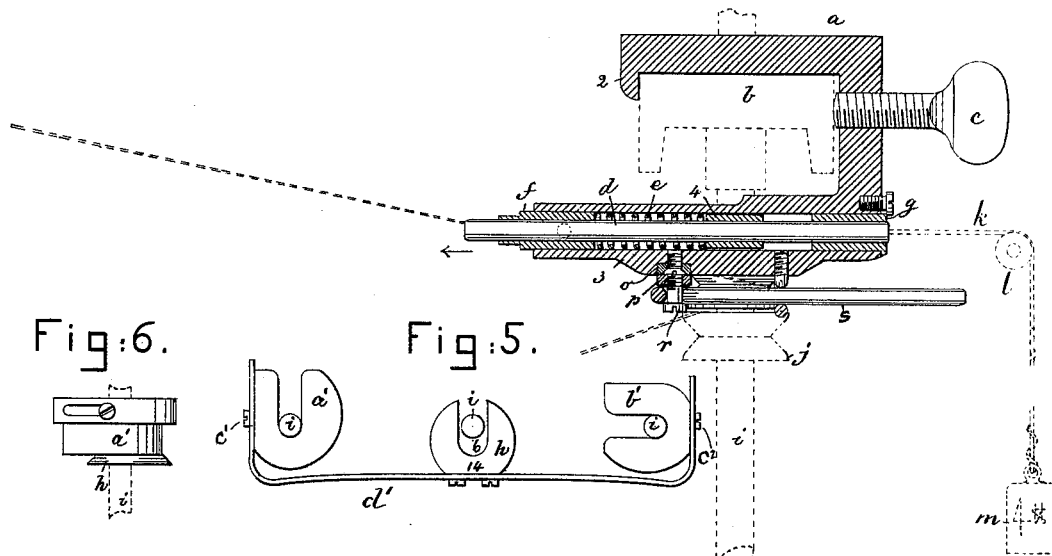


Fig:6.

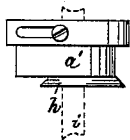


Fig:5.

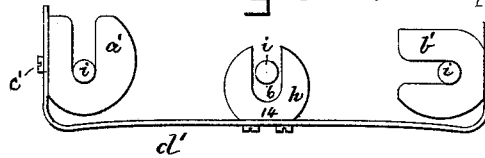


Fig:2.

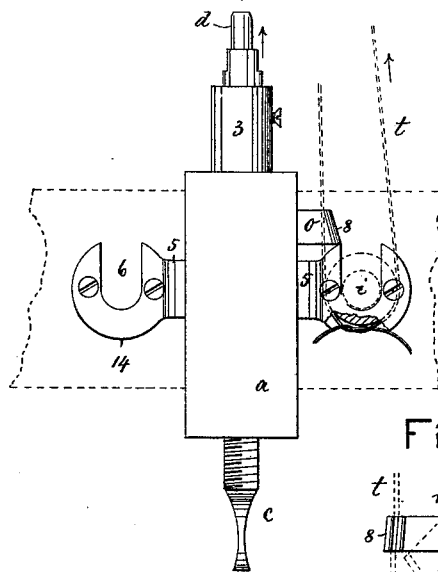


Fig:3.

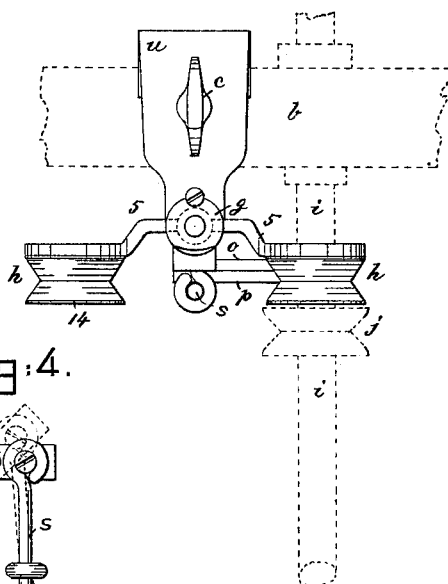
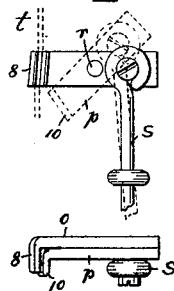


Fig:4.



Witnesses.
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UNITED STATES PATENT OFFICE.

WILLIAM F. DRAPER, OF HOPEDALE, MASSACHUSETTS.

IMPROVEMENT IN DEVICES FOR INDICATING TENSION IN THE ADJUSTMENT OF SPINDLE-BANDS.

Specification forming part of Letters Patent No. **220,587**, dated October 14, 1879; application filed May 19, 1879.

To all whom it may concern:

Be it known that I, WM. F. DRAPER, of Hopedale, county of Worcester, State of Massachusetts, have invented an Improved Device for Indicating the Tension in the Adjustment of Spindle-Bands on Spinning-Machines, of which the following description, in connection with the accompanying drawings, is a specification.

This invention relates to apparatus for applying spindle-bands for spinning-machines to insure just the proper amount of tension required to rotate the spindles without any undue expenditure of power, as is the case when the bands are too taut.

I have found by experiment that the spindles of an ordinary ring-spinning frame can be best driven by a band which exerts a strain of about four pounds; but in improved frames, like the Sawyer, a strain of two pounds is amply sufficient.

As now practiced, the workmen who adjust the bands have no means of measuring the force, pressure, or strain of the bands as they are being applied to the spindle drum and whirl, and to insure that the strain or force of the bands be always sufficient to rotate the spindles the bands are tied or spliced under more tension than is absolutely necessary, (in the great majority of instances more than twice as taut as is necessary;) consequently much power is wasted, and the bearings and spindles and band are unnecessarily worn.

The expenditure of power required to rotate the spindles is almost in direct proportion to the tension of the bands, the weight of the spindle being a much less important factor.

This my apparatus is especially designed to enable the person uniting or splicing the spindle-bands to apply all the bands of the machine or frame at a uniform or like tension, the amount or degree of strain or tension having been first determined accurately according to the machine and the work to be done.

Figure 1 represents, in section, one form of my apparatus as applied to and in position upon the bolster-rail of a spinning-frame, the said rail and spindle being shown in dotted lines. Fig. 2 is a top view of one of my band-adjusters; Fig. 3, an end view; Fig. 4, a detail of the band-holder, and Fig. 5 a modification to be referred to.

The metallic holding frame or clamp *a*, shaped to extend across the bolster-rail *b*, (shown in dotted lines,) has a lip, 2, to rest against one side of the said rail, while the set-screw *c* bears against the opposite side of the rail to confine or clamp it in position upon the rail.

The lower portion, 3, of the frame is made tubular, or is provided with a suitable passage-way or opening (see Fig. 1) to receive within it the regulating-rod *d*. This rod *d* has attached to it a suitable collar or other stop, 4, is surrounded by a spiral spring, *e*, and is guided in sleeves *f g*, the former of which is made horizontally adjustable in the said passage-way to vary the stress or force of the spring *e*.

The normal position of the stop 4 is with its right-hand end in contact with the sleeve or outward stop, *g*.

By adjusting the spring-controlling sleeve *f* the stress or force of spring *e* may be increased or lessened as may be desired, so as to necessitate the exertion or strain of four pounds, or any other desired amount, in order to move the rod *d* longitudinally in the direction of the arrow and place the peripheries of the band-receivers *h* in line with the peripheries of the whirls *j*, as indicated in Figs. 1 and 3, as is necessary when the bands are being applied. Attached to this rod *d* are arms 5, having band-receivers *h*, (one or more,) each having enlarged slots 6, extended toward and past the center of the said belt-receivers for a distance substantially equal to or in excess of the radius of the usual spindle *i*. (Shown in dotted lines.)

Instead of the adjustable spring *e* to vary the force required to move the regulating-rod in the direction of the arrow, Fig. 1, I may attach to the rod a cord or flexible connection, *k*, pass it over a sheave or pulley, *l*, and attach to the flexible connection weights *m*, as shown at the right of Fig. 1 in dotted lines, the object of the spring or weights, if they be used, being to vary or regulate the power required to move the regulating-rod to a certain defined position, or, in other words, to measure or weigh, as with a spring balance or scale, the strain with which the bands are held while being spliced or applied to the usual tin drum and whirls. This regulating-rod *d* and spring

or weight thus become a measuring apparatus, to indicate in pounds and ounces or other proper subdivisions the strain of the bands. I shall therefore denominate this rod *d* and spring or weight as the strain indicating or measuring device.

At the under side of frame *a* is a band-holder, composed of a fixed arm, *o*, having a lug or downwardly-projecting portion, *S*, with its inner face placed oblique to the arm *o*, (see Fig. 4,) and a similar arm, *p*, and lug 10, pivoted together at *r*, the arm *p* having connected with it a rod, *s*, by which to turn the movable part *p* of the holder upon its fixed part *o*.

To properly apply a band one end—say, that end extending from the whirl under and above the drum—should be held in fixed position, so as not to slip while the other end of the band from above the drum is being drawn to give it the required strain or tension.

When a band, *t*, is to be applied, one part of it, near one end, is placed in the holder and clamped, as in Figs. 2 and 4, and there held, so that strain on the said band *t* in the direction of the arrow near it in Fig. 2 will effectually hold the band from slipping. The band is then passed about the usual drum, and carried back about the spindle and about the band-receiver *h*, as in Fig. 2, where the ends are placed together to be tied or spliced. The spring *e* having been set at the proper point, or proper weights having been applied, according to the tension desired for the band, the said band is strained sufficiently about the band-receiver in the direction of the arrow near it, so as to place the peripheries of the band-receiver and whirl in the same vertical line, or so as to coincide. With the receiver held in this position by the band, its ends are fastened, and the band is slipped from the receiver upon the regular whirl, its tension or strain having been determined and adjusted to the requirements of the work before being applied to the whirl. After the band is applied to the whirl, or is fastened, it is released from the holder.

The diameter of the belt-receiver and the spindle-whirl are substantially the same, and the normal position of the receiver is such that it rests with its full edge 14 outside the outer edge of the whirl.

In this my method of applying spindle-bands they are applied and united while held under a defined or accurately-measured strain, a strain made more or less by a spring or weight, which is active against and within the band as its ends are being united; and having shown one practical way of practicing my said method, I desire it to be understood that I do not desire or intend to limit myself to the exact devices herein shown, for it is obvious that other devices might be employed to operate in a like manner.

My apparatus is not intended to be used to indicate the strain or tension of a band already fully united at its ends, but is especially con-

structed to enable the band to be so united that it will exert just the pressure necessary to drive the spindle without undue expenditure of power.

The devices for holding the band under tension will, preferably, be attached to a clamp to be applied to the bolster-rail; but said devices might be otherwise held in proper position to co-operate with the spindle whirl and band, as described.

In the apparatus herein described two bands may be united and placed upon their whirls without removal of the frame *a*.

In the modification Fig. 5, I have shown the band-receiver *h* mounted upon a stiff steel spring, *d'*, adjustably attached by set or adjusting screws *c'* *c''* to the spindle-embracing blocks *a'* *b'*, the screws entering slots in the end of the spring to permit it to be on the blocks, to place the band-receiver so that it will stand with its edge 14 more or less at the rear of the whirl, above which it is placed. The blocks *a'* *b'* each embrace a spindle, and are preferably slotted in opposite directions, so as to assist in keeping the band-adjuster in position while a band on the band-receiver is being tied, the spring *d'* during said operation yielding centrally.

I am fully aware of an application for patent for apparatus for testing the strain of belts or bands in machinery filed by Jacob H. Sawyer in the United States Patent Office May 19, 1879, wherein is shown a spring-balance having an attached slotted annulus to be applied at the side of the pulley, so as to receive upon it the endless band of the said pulley to test the strain which the said band exerts upon the said spindle or shaft when the band is in place upon the pulley fixed thereon, and I herein specially disclaim any and all the devices and mechanism shown in the said Sawyer application.

In this my invention the sole aim and object is to enable a band to be tied or united at its end, so as to always thereafter exert a determined amount of strain, and no more, which cannot be accomplished with the Sawyer devices.

I claim—

1. The strain indicating and measuring apparatus, and means for holding or securing it in operative position with relation to the spindle-rail and spindles, combined with the slotted belt-receiver adapted to embrace the spindle near its whirl and to be drawn toward the usual spindle-driving drum by the spindle-band as it is being united, until the band-receiver and whirl coincide in position, as described, to thereby permit the band united under the desired strain on the receiver to be slipped from the receiver upon the whirl, as herein set forth.

2. The combination, with the strain-indicating device and its slotted belt-receiver, as described, to hold a spindle-band while being united, as described, of the pivoted holder to

grasp and confine the band near one end while its free ends are being united together, substantially as and for the purpose described.

3. The clamp to embrace the bolster-rail, the sliding regulating-rod, and one or more attached band-receivers, combined with a spring and an adjusting device to regulate the pressure of the spring, all substantially as described.

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

WM. F. DRAPER.

Witnesses:

G. W. GREGORY,
N. E. WHITNEY.