(No Model.)

J. E. TYNAN.

BELT TIGHTENER FOR SPINNING MACHINES, &c.

No. 336,027. Patented Feb. 9, 1886.

Fig. 1.

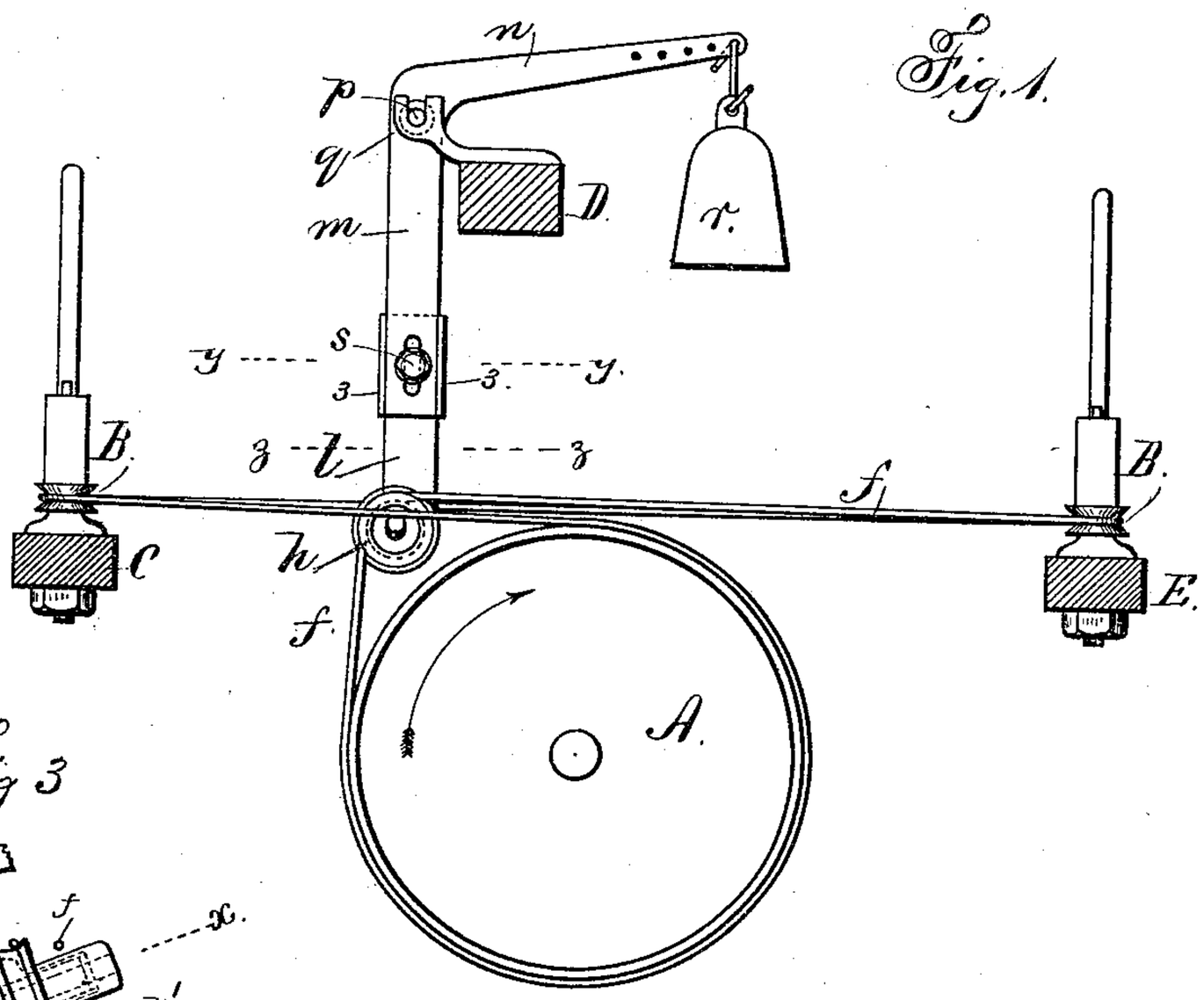


Fig 3

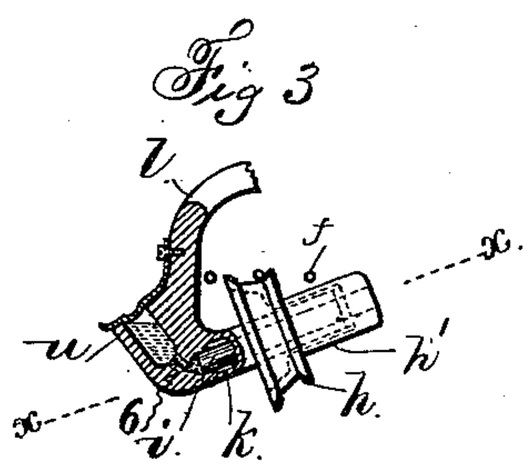
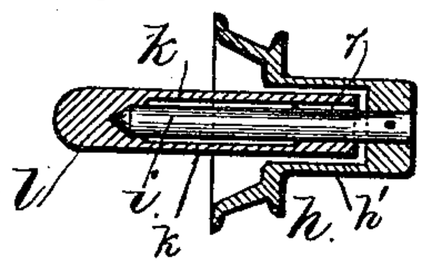
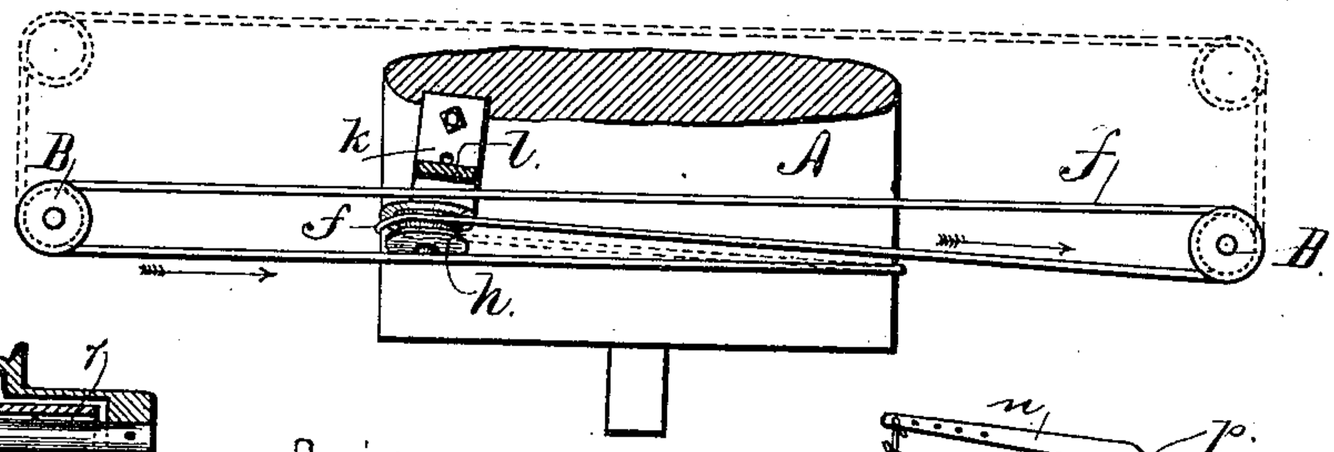


Fig. 2.

Fig 4.





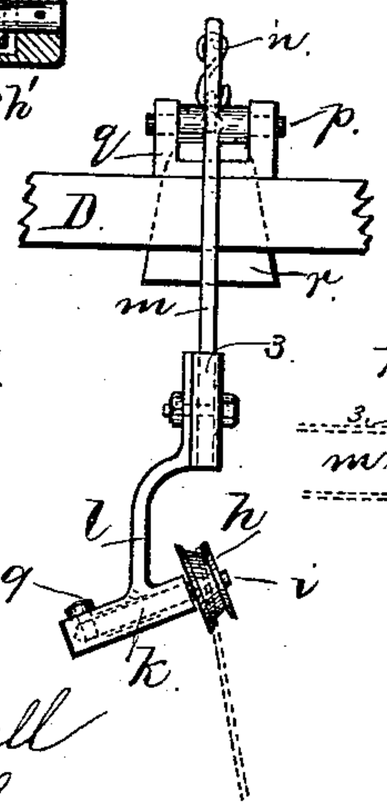


Fig. 6.

Fig. 7

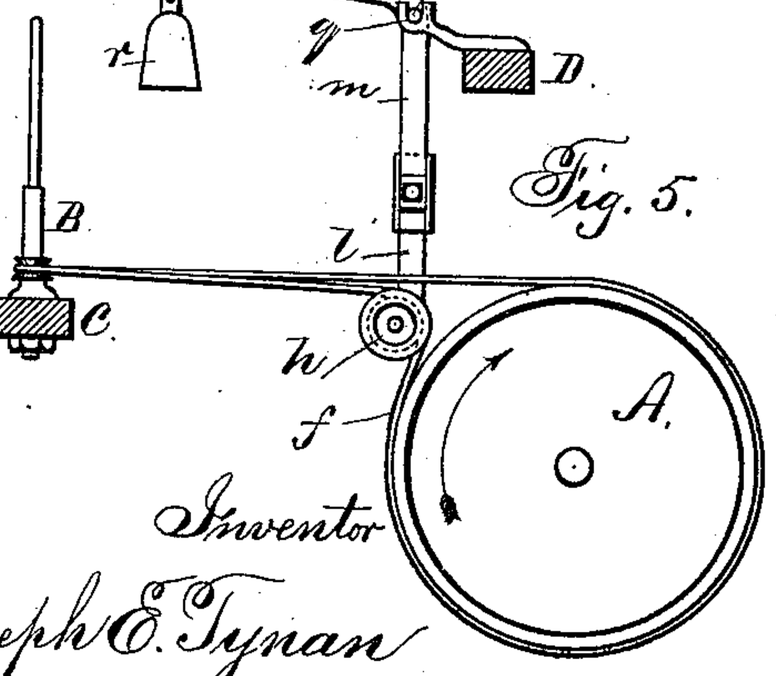


Fig. 5.

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UNITED STATES PATENT OFFICE.

JOSEPH E. TYNAN, OF PATERSON, NEW JERSEY.

BELT-TIGHTENER FOR SPINNING-MACHINES, &c.

SPECIFICATION forming part of Letters Patent No. 336,027, dated February 9, 1886.

Application filed November 24, 1884. Serial No. 148,704. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH E. TYNAN, of Paterson, in the county of Passaic and State of New Jersey, have invented an Improvement in Belt-Tighteners for Spinning-Machines, &c., of which the following is a specification.

Belts for driving the spindles in spinning and twisting machinery have passed around a drum and off horizontally around the pulleys of the spindles at opposite sides of the machine, and then from one pulley to the other in a straight line, each belt being endless and driving two spindles. Difficulty has arisen in applying a tightening-pulley to such belt, because the axle of the pulley being horizontal, it could not be immersed in oil, as in an ordinary vertical spindle, and when the oil is supplied it is liable to run out of the box and be thrown off by centrifugal force, greatly to the detriment of the material, especially in spinning cotton, besides which the axle of the tightener becomes dry and heated by friction.

The object of the present invention is to supply oil to the axle of the tightening-pulley in such a way that the end of the axle will be immersed in oil, and oil will not be thrown or run out of the axle box, and also to allow for the pulley being placed so as to accommodate the direction in which the belt is led off, or in which it is crossed in its passage to the pulleys of the spindles.

In the drawings, Figure 1 is an end elevation representing the driving-drum, spindles, belt, and tightener, with the rails in cross-section. Fig. 2 is a plan view, the arm of the tightener being in section at the line *z z* of Fig. 1. Fig. 3 is an elevation and partial section of the tightener at right angles to Fig. 1. Fig. 4 is a section through the line *x x* of Fig. 3, in larger size. Fig. 5 represents the tightener applied in a different position to the belt. Fig. 6 is an elevation of the tightener with the pulley at the end of its axle, and Fig. 7 is a plan view of the arm of tightener at the line *y y* of Fig. 1.

The pulley or drum A, the spindle-pulleys B, and rails C D E are of any usual or desired character.

The belt *f* passes around the drum A and around the pulleys B, and in a straight line from one pulley to the other, as shown by the full lines, or else four pulleys are driven by one belt in the manner indicated by the dotted lines, Fig. 2.

The tightening-pulley *h* is upon an axle, *i*, in the oil-cup *k*, and this oil-cup is at the end of a stock, *l*, which is bolted to the vertical arm of the bent lever *m n*. The pivot *p* of this lever is received into the fork or bearing *q* upon the rail D, and *r* is a weight upon the lever-arm *n*, that applies the proper force to strain the belt. The axle of the tightener *h*, instead of being horizontal, is at an inclination, and the pulley itself, instead of being a cylinder with flanges, is a truncated cone with flanges.

By applying the tightener as shown I am able to arrange the upper surface of the tightener-pulley nearly level or parallel with the top surface of the drum, in order that the belt may pass off properly to one of the pulleys B, and the axle of the pulley is at a downward inclination, and it is also in a vertical plane—that is, at an inclination to the axis of the drum A—in order that the conical surface of the tightener may be parallel, or nearly so, with that side of the drum from which the belt passes up nearly vertically to the said tightener.

The stock *l* is connected to the arm *m* by the bolt *s*, and there is a slot that allows the stock to be adjusted vertically for placing and holding the tightening-pulley at the desired height to insure the proper lead of the belt. By making the arm *m* with ribs 3 the stock *l* will be steadied between said ribs, and the stock cannot turn upon the bolt *s*, and by making the arm *m* trapezoidal in section, as shown in Fig. 7, the stock *l* can be bolted at either side of said arm *m*, and it will occupy either the positions indicated in Figs. 2 and 7 by full lines, or else the position shown by the dotted lines in Fig. 7. In either instance the inclined axle of the tightening-pulley will be in a vertical plane—that is, at an inclination to the axis of the drum A, the object sought being to place the tightener in the proper position. The drum A is presumed always to revolve in one direction. If the spindles are to be revolved in the direction indicated by the arrows, Fig. 2, the belt will be passed around the drum and

spindle - pulleys in the direction shown; but if the spindle-pulleys are to be driven in the opposite direction the lead of the belt will be changed in the usual manner; but in each instance the tightener is to be applied to the belt near where it leaves the drum, not where the belt is approaching the drum; hence to accommodate the position of the belt the tightener and its stock are made so as to be placed at an inclination in either direction, as aforesaid.

The bearing for the axle of the tightening-pulley is shown partially in section in Fig. 3, and in sectional plan, Fig. 4, it is closed at its lower end, and forms a socket, *k*, into which such axle is passed, and there is an oil-receiving chamber, *u*, with a communicating passage, 6, near the lower end of the socket, which passage allows the oil to pass to the axle.

The socket is cored or bored out, so that there is formed an oil-chamber around the axle of the tightening-pulley, with a bearing at each end for such axle, and in the outer bearing there is a longitudinal channel, as shown at 7, Fig. 4, into which the surplus oil upon the surface of the axle passes and returns into the chamber, and thereby such oil does not accumulate around the upper end of the axle or pass out upon the pulley.

It is to be understood that with an axle revolving under the circumstances set forth the oil is liable to rise and accumulate around the axle and above the outer and higher bearing. Where the interior surface of this bearing has in it a longitudinal channel, 7, the oil will run through the same back into the oil-chamber at the lower end of the axle.

The improved tightener may be applied to the belt in the position shown by the diagram, Fig. 5, if desired, the parts of the tightener and its lever remaining unchanged; but the tightener acts to press the bight of the belt toward the drum A instead of away from the drum, as in Fig. 1.

In Fig. 6 the pulley is shown at the outer end of the axle *i;* but I prefer to permanently connect the pulley *h* to the axle *i* by a sleeve, *h'*, that surrounds the tubular bearing or box *k*, in order that the pulley may surround the middle part of the axle, and thereby the strain upon the axis and the wear may be more uniform.

I do not limit myself as to the position in which the tightener or the drum may stand to the spindles, as the same may require to be varied, so as to accommodate the direction in which the belt travels, and the other parts of the machine; and I do not limit myself to the peculiar stock and trapezoidal arm represented, as the pulley, with its inclined axle, tubular socket, and oil-chamber, may be supported by any ordinary devices.

I claim as my invention—

1. The combination, with the drum A, spindle-pulleys B, and belt *f*, of a tightening-pulley, the axle of which is inclined downwardly, a socket for receiving such axle and containing an oil-chamber, and a stock and lever, substantially as set forth.

2. The combination, with the drum, spindle-pulleys, and belt, of a tightening-pulley having a conical surface, an inclined axle for the tightening-pulley, and a socket containing an oil-chamber, and a support for said socket, substantially as set forth.

3. The combination, with the tightening-pulley and its axle, of an inclined socket containing an oil-chamber for the axle, a stock, and a bent lever having a trapezoidal bearing, upon the surface of which the stock is bolted, substantially as set forth.

4. The combination, with the driving-drum, spindle, and belt, of the pulley, its axle, and a sleeve to connect the pulley and axle, a tubular inclined socket containing an oil-chamber and forming a bearing for the axle, and a support for holding the socket and axle in an inclined position, substantially as set forth.

5. The combination, with the driving-drum, spindle, and belt, of the pulley and its axle, a tubular inclined socket, forming a bearing for the axle, with an oil-chamber in said socket, and a longitudinal groove, 7, for receiving the oil upon the axle and returning the same into the oil-chamber, and a support for holding the socket and axle in an inclined position, substantially as set forth.

Signed by me this 18th day of November, A. D. 1884.

JOSEPH E. TYNAN.

Witnesses:
WILLIAM G. MOTT,
HAROLD SERRELL.