No. 610,552. Patented Sept. 13, 1898.

J. T. MEATS & T. W. DEAN.

TWIST INDICATOR FOR SPINNING MACHINES.

(No Model.) (Application filed July 2, 1898.)

Fig. 1

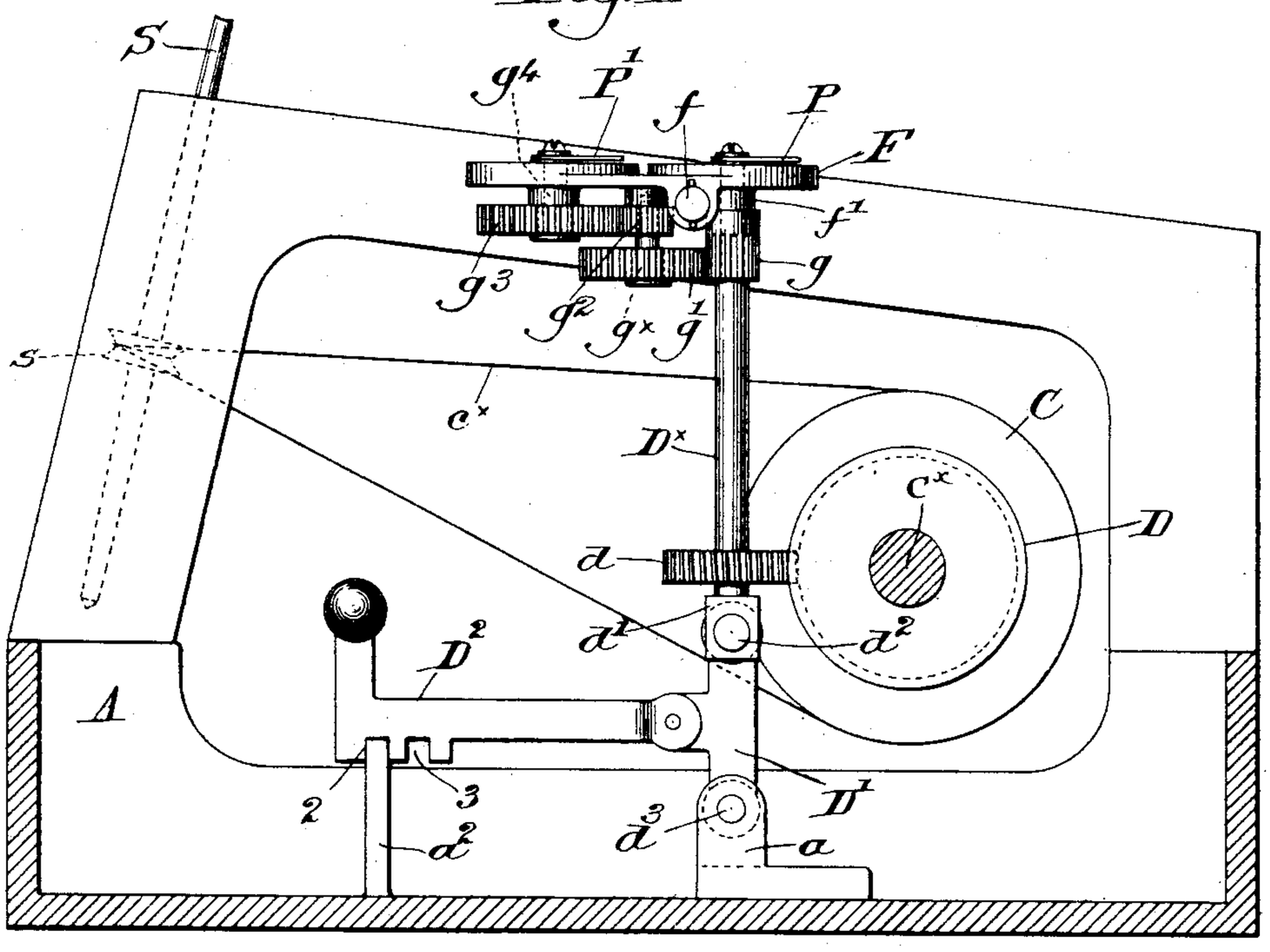
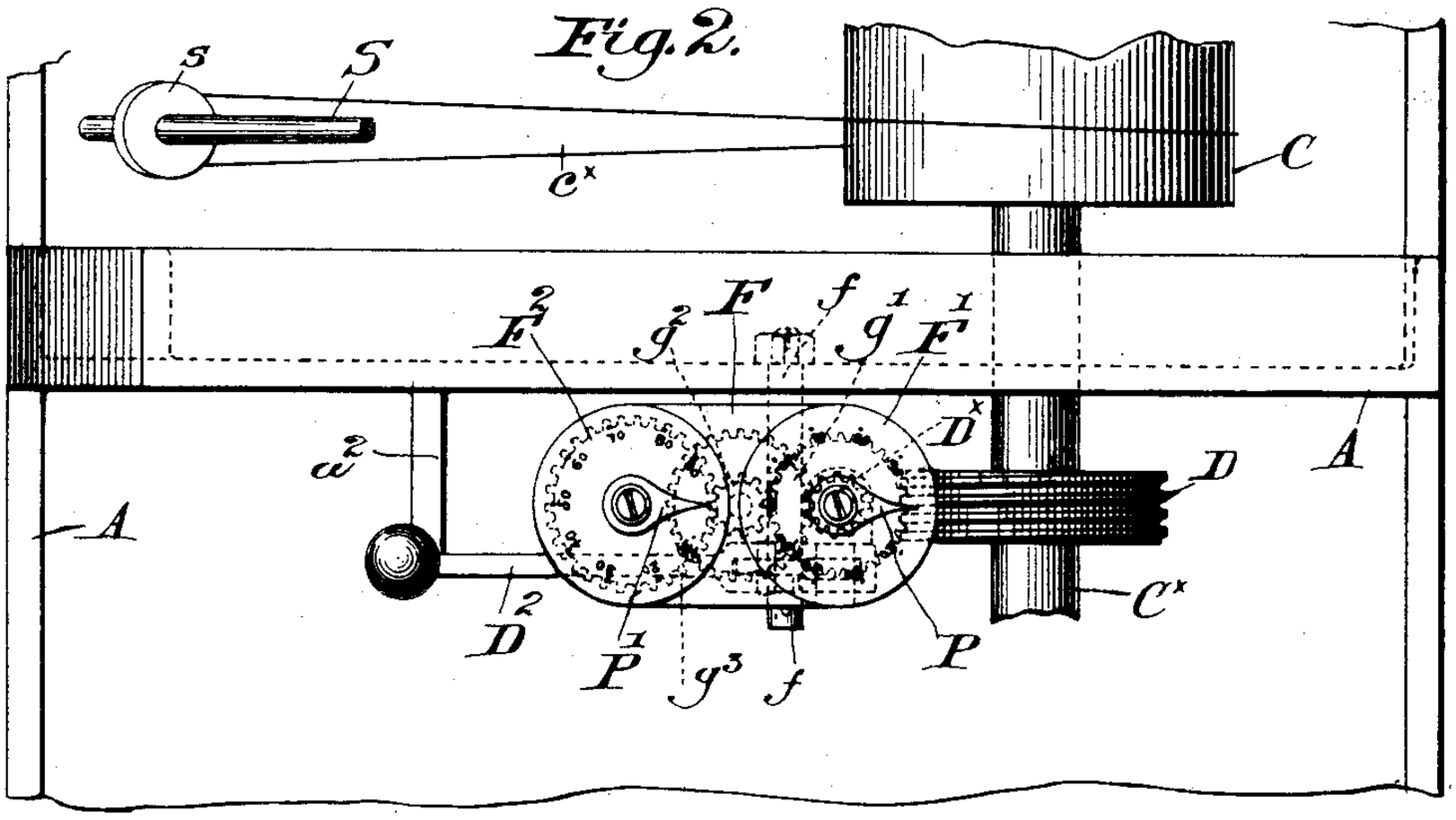


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN T. MEATS AND TRUMAN W. DEAN, OF TAUNTON, MASSACHUSETTS, ASSIGNORS TO THE MASON MACHINE WORKS, OF SAME PLACE.

TWIST-INDICATOR FOR SPINNING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 610,552, dated September 13, 1898.

Application filed July 2, 1898. Serial No. 685,014. (No model.)

To all whom it may concern:

Be it known that we, JOHN T. MEATS and TRUMAN W. DEAN, of Taunton, county of Bristol, State of Massachusetts, have invented an Improvement in Twist-Indicators for Spinning-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention has for its object the production of means for determining quickly and reliably the number of twists per inch which is put into the yarn being spun upon a spinning-mule.

The spindles of a mule practically come to a standstill when the carriage is in at the roller-beam immediately after the winding operation has ceased and before the spinning operation commences, and the spindles do not attain the maximum spinning speed until the carriage has gone some distance from the roller-beam on the outward draw. Again, the spindles again come gradually to a standstill before the backing off takes place at the outward end of the draw or stretch. These several facts have heretofore rendered it practically impossible to compute the number of revolutions which the spindles make during the draw or, in other words, what twist per inch is being put into the yarn. The usual speed-indicators as applied to the ends of spindles or shafts cannot be used for this purpose, for it has been found in actual practice impossible to make an indicator that will not slip to such an extent as to render an accurate result impossible, owing to the exceedingly high speed which the spindle attains in spinning fine numbers of yarn.

By our invention we have overcome the difficulties and objections referred to and we are enabled to attain accurate results with ease and rapidity.

Figure 1 represents in end elevation and partial section a sufficient portion of a mule-carriage to be understood with our invention applied thereto, and Fig. 2 is a top or plan view thereof.

The frame A of the carriage, the spindle S, broken off at its upper end and provided with a whirl *s*, the driving cylinder or drum C, which imparts motion to the spindle by the endless band $c^{\times}$, and the drum-shaft $C^{\times}$, driven by suitable mechanism, (not shown,) may be and are all of usual or well-known construction in mule-spinning machines.

To the drum-shaft $C^{\times}$ is attached a worm D, which is adapted to at times engage and rotate a worm-gear *d*, secured to or forming part of an upright shaft $D^{\times}$, having a lower end bearing in a block *d'*, pivoted at d^2 on a rocker-arm D', which latter is pivoted at its lower end at d^3 to an ear *a*, attached to the frame A of the carriage. The rocker-arm may be swung toward or away from the worm D to effect engagement or disengagement of the worm and worm-gear *d* by means of a pivotally-connected handle-bar D^2, provided with notches 2 3, Fig. 1, one or other of which is adapted to engage a lug a^2 on the carriage-frame.

A dial-frame F is swiveled upon a horizontal stud *f* on the carriage-frame A, the dial-frame having a bearing *f'* for the upper end of the shaft $D^{\times}$, which is extended through the frame and provided with a pointer P, adapted to travel over the dial F' and indicate the revolutions and parts of a revolution made by said shaft, and more particularly the number of spindle revolutions up to one hundred, as will be described. The swiveling of the dial-frame permits the movement of the shaft $D^{\times}$ to effect engagement or disengagement of the worm and worm-gear by the movement of the rocker-arm D', as described.

Upon the shaft $D^{\times}$, which is the transmitting member between the drum C and dial-frame, is secured a pinion *g* below the bearing *f'*, said pinion meshing with a gear *g'*, supported by and rotatable on a stud $g^{\times}$, depending from the dial-frame. This gear *g'* has an attached pinion g^2, which transmits rotative movement to the indicator-gear g^3, fast on a shaft g^4, having a bearing in the dial-frame and passing therethrough, the upper end of the shaft having fast upon it a pointer P', which travels over the face of the dial F^2, Fig. 2, to indicate the number of hundreds of revolutions which the spindle S has made. The pinions *g* and g^2 should have eighteen teeth each and the gear fifty-four teeth,

while the gear g^3 should have sixty teeth in order to indicate the revolutions of the spindles, as hereinafter described. The number of revolutions made by the spindle divided by the length of the stretch or draw in inches gives the number of turns of twist per inch put into the yarn.

The drawings represent the parts with the worm D in mesh with the worm-gear *d* or in operative position, and in order to accurately determine the number of revolutions made by the spindle in the outward stretch or spinning part of the draw the indicating mechanism is thrown into operation by or through the handle D^2 immediately after the carriage begins its outward movement. The mechanism is thrown out of operation immediately after the draw is completed and before the backing off begins. The pointers on the dial-frame will then indicate the revolutions made by the spindles in the draw.

It will be obvious that there is no opportunity for slip or inaccurate movement of the indicator mechanism herein shown and described, and the said mechanism is always in position ready to be thrown into operation when it is desired to determine the twist being put into the yarn.

Relative to the indicating mechanism herein shown it is to be noted that it is desirable to attain thereby the final result as near as may be, and consequently an indicator showing only the revolutions of the drum would not be as satisfactory as one showing the revolutions of the spindle, thus leaving merely the division by the length of the stretch to obtain the twist per inch.

With the two dials, as herein illustrated, it will be supposed that we are spinning yarn having thirty-five turns of twist per inch, that the stretch or draw is sixty-seven inches, the diameter of the drum C six inches, and the whirl diameter three-fourths of one inch—dimensions in accord with actual practice. If the worm D is double-threaded, driving the worm-gear *d* of twenty-five teeth, then the drum makes twelve and one-half revolutions to one of the shaft $D^{\times}$, and as the whirl makes eight revolutions to one of the drum then $8 \times 12\frac{1}{2} = 100$ revolutions of the spindle for each revolution of the pointer P. The dial-face F′ is therefore graduated up to "100," and the other face F^2 is similarly graduated; but as its pointer P′ is geared $\left(\frac{18}{60} \times \frac{18}{54}\right)$ to make one revolution to ten of pointer P its dial-face F^2 of course represents hundreds up to one thousand, while the first dial-face F′ represents units up to one hundred. In the example referred to, sixty-seven inches stretch and thirty-five turns of twist per inch, the face F′ would indicate "45" and the dial-face F^2 would indicate "23," two thousand three hundred and forty-five being the number of turns of twist in one stretch. Dividing two thousand three hundred and forty-five by the number of inches of stretch—viz., sixty-seven—we get the required answer, thirty-five, the number of turns of twist per inch.

Having described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In an apparatus of the class described, the spindle-driving drum having a worm rotatable therewith, speed-indicating mechanism, including a transmitting-shaft having an attached worm-gear, and means to throw said worm-gear and worm into or out of engagement.

2. In an apparatus of the class described, the spindle-driving drum having a worm rotatable therewith, pivotally-mounted speed-indicating mechanism, including a transmitting-shaft having an attached worm-gear, a rocker-arm having an end bearing for said shaft pivoted upon it, and means to rock said arm to effect engagement or disengagement of said worm-gear or worm.

3. In an apparatus of the class described, the spindle-driving drum having a worm rotatable therewith, a frame having two dials and coöperating pointers, a shaft mounted in the frame and to which one of said pointers is attached, gearing intermediate said shaft and the other pointer, to operate the latter, a worm-gear on said shaft, means to move said worm-gear into or out of engagement with the worm, and a locking device for said means.

4. In an apparatus of the class described, the mule-carriage provided with a spindle-driving drum, a gear rotatable therewith, speed-indicating mechanism pivotally mounted on the carriage adjacent the drum, said mechanism including a transmitting-shaft having a gear thereon, means to effect engagement or disengagement of said shaft and drum-gears, and a locking device for said means.

5. In an apparatus of the class described, the spindle-driving drum having an attached worm, a dial and coöperating pointer, a shaft having a worm-gear, connections between said shaft and the pointer, to transmit rotation of the shaft to said pointer, and means to throw said worm and gear into or out of engagement.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOHN T. MEATS.
TRUMAN W. DEAN.

Witnesses:
JAMES E. GREENSMITH,
P. RUSSELL BOSWORTH.