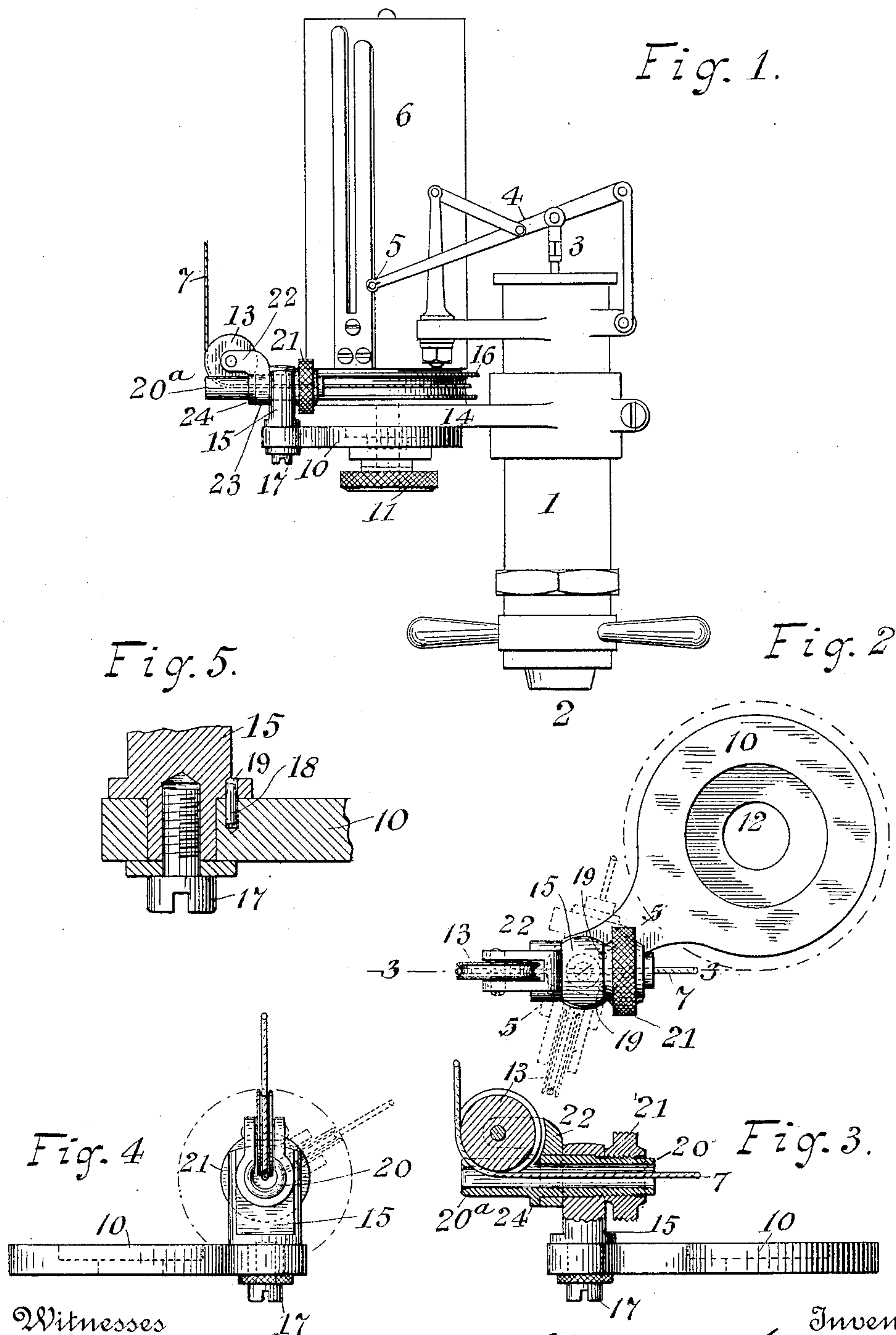


(No Model.)

W. HOUGHTALING.
STEAM ENGINE INDICATOR.

No. 533,812.

Patented Feb. 5, 1895.



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM HOUGHTALING, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE
ASHCROFT MANUFACTURING COMPANY, OF SAME PLACE.

STEAM-ENGINE INDICATOR.

SPECIFICATION forming part of Letters Patent No. 533,812, dated February 5, 1895.

Application filed March 3, 1893. Renewed July 20, 1894. Serial No. 518,156. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HOUGHTALING, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Steam-Engine Indicators, of which the following is a specification.

This invention relates to means for adjusting the leading off pulley so as to carry the cord in any desired direction from the cylinder of a steam engine indicator, and render the indicator adaptable for the attachment of its cord to a reciprocating part of the engine, in whatever relative position it may occur, according to the type of engine to be tested. I employ a leading off pulley capable of use as a right-hand or left-hand indicator; the cord being passed tangentially to either side of the cylinder from the pulley, and extended off from the pulley in any desired direction to the reciprocating part of the engine to which said cord is attached.

It is of importance, in point of commercial merit, to secure a construction that shall admit of convenient, quick, and accurate adjustment of all the parts in setting up an indicator to take accurate cards, and it is the object of my present improvement to promote such adjustment, and also to combine simple and advantageous means of performing and binding the respective adjustments.

To this end, the invention consists in certain features of construction hereinafter described and pointed out in the appended claims.

Referring to the accompanying drawings, in which the same numerals of reference indicate the same parts in each view, Figure 1, is a side elevation showing a steam engine indicator having my invention applied thereto; Fig. 2, a plan view, enlarged, representing the pulley and its mountings, including the adjustable base plate, detached from beneath the card cylinder; Fig. 3, a side view partly in section on the line 3—3 of Fig. 2; Fig. 4, another side elevational view in a direction at right angles to that relating to Fig. 3; and Fig. 5, a further enlarged sectional view taken on the line 5—5, Fig. 2.

Referring to the general parts common to

indicators; 1, is the pressure cylinder, to be mounted on a steam pipe attached at 2, or otherwise suitably mounted; 3, the piston rod attached to a suitable piston within; 4, the index arm carrying the pencil 5, guided in a true vertical line by the compensating levers; and 6, the card cylinder which is rotated to and fro, carrying the paper, being operated in the usual manner, in one direction by the cord 7, and in the other by a retracting spring within said card cylinder.

Referring now to the improved parts, and their mountings; 10, is the adjustable base plate, which by means of the clamping screw 11, and its washer fitting the hole 12, and binding said plate to the arm 14, of the machine, serves to support the pulley 13, in its first adjustment about the axis of the card cylinder 6.

15, is the pulley post, which is provided with means for adjusting it in two specific positions, determining the second adjustment of the pulley 13, namely, about an axis (15) removed from, but parallel with the axis of the cylinder 6, so that the shank of said pulley shall extend in true tangential line with the surface of the cord drum 16 (Fig. 1) of the cylinder 6, to run the cord on either side thereof; rendering the indicator convertible right-hand or left-hand.

The pulley post 15, is provided with a clamping screw 17; and a dowel 18, projects from the supporting arm of the plate 10, so that the post 15, having two perforations 19 under it, as indicated in the enlarged view Fig. 5, and by dotted lines in Fig. 2, may without close observation or delay, be adjusted and clamped in either position so that the cord will run perfectly true without interference or friction on any adjacent parts, or the post changed from one position to the other. The clamping screw is merely loosened slightly without removing it, and the post raised sufficiently to clear the dowel 18, then turned and reset.

20, is a shank upon which the arm 22, carrying the pulley 13, is mounted, and by means of which the said pulley has its third adjustment about an axis at right angles to the axis of the aforesaid second adjustment; the shank 20 being turned in the post 15, by hand, and secured firmly, by means of the collar 24 and

clamping screw 21, which draws said shank longitudinally with the arm 22 abutting against the post 15, as clearly appears in Fig.

3. The shank 20, is tubular, affording a passage for the cord 7, as indicated, and has a continued extension 20^a, intersected on one side by the pulley 13, affording thereby a safety guard for the cord, preventing its being thrown off the pulley in the event of any incidental slack therein.

The arm 22 connected with the shank 20, is capable of sliding thereon for the purpose of removal, which is effected by first removing the pulley 13; the collar 24 being fixed to the shank 20 to hold the pulley arm longitudinally, and which is cut away to present a plane surface to the pulley arm 22, to prevent the latter's rotation, but allowing it to move longitudinally thereon.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a steam engine indicator, a leading off cord pulley supported upon a bracket adjustable about the axis of the card cylinder and mounted upon a post or standard having two fixed adjustments (as dowel 13 and perforations 19) relative to said bracket, whereby said pulley may be used at either side of the card cylinder, as set forth.

2. The standard 15, carrying the rotative adjustable tubular shank 20, having collar 24, the removable pulley-supporting arm 22, and clamp 21, substantially as described.

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Witnesses:

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