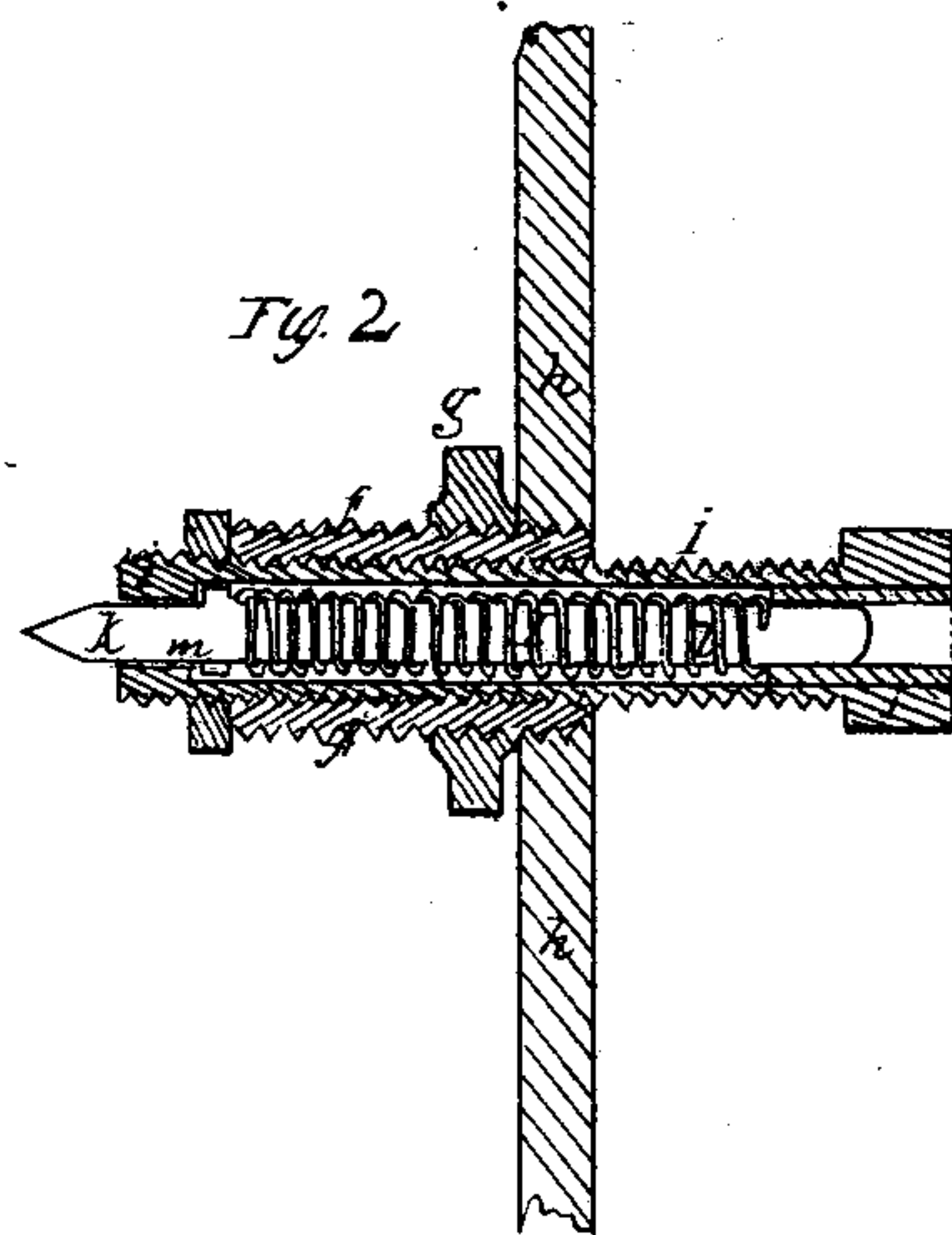
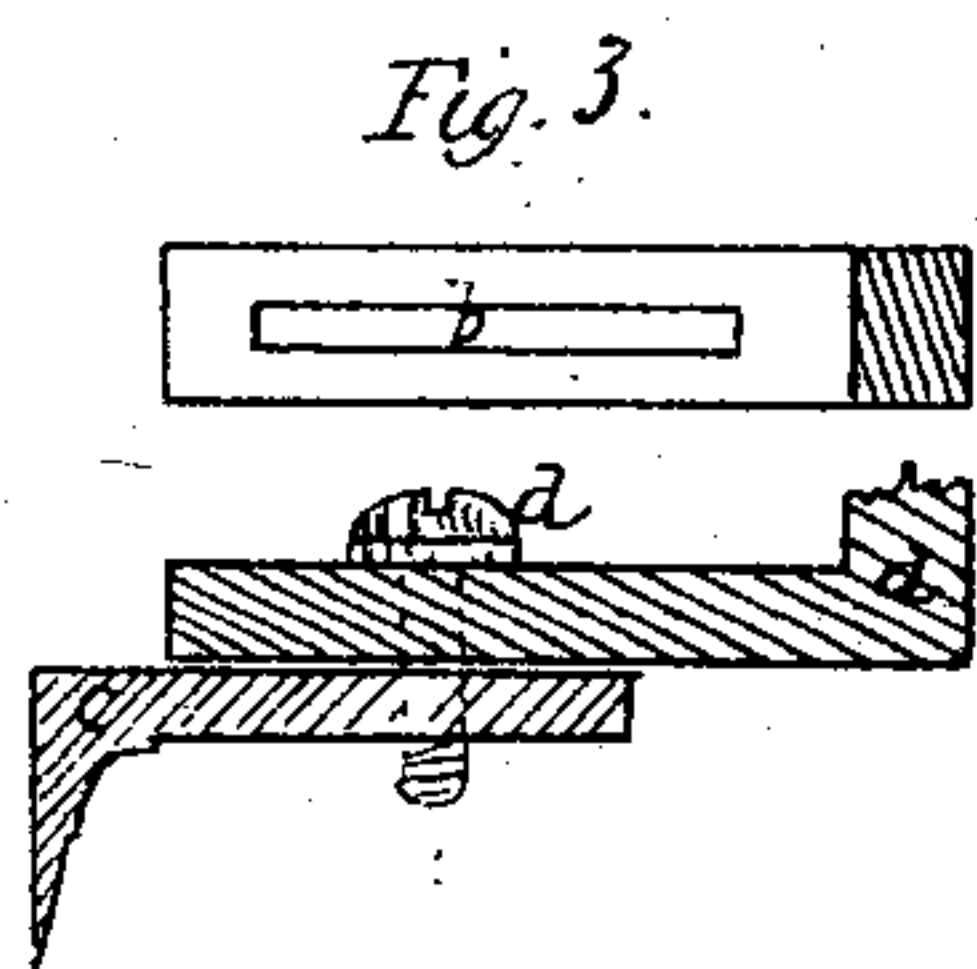
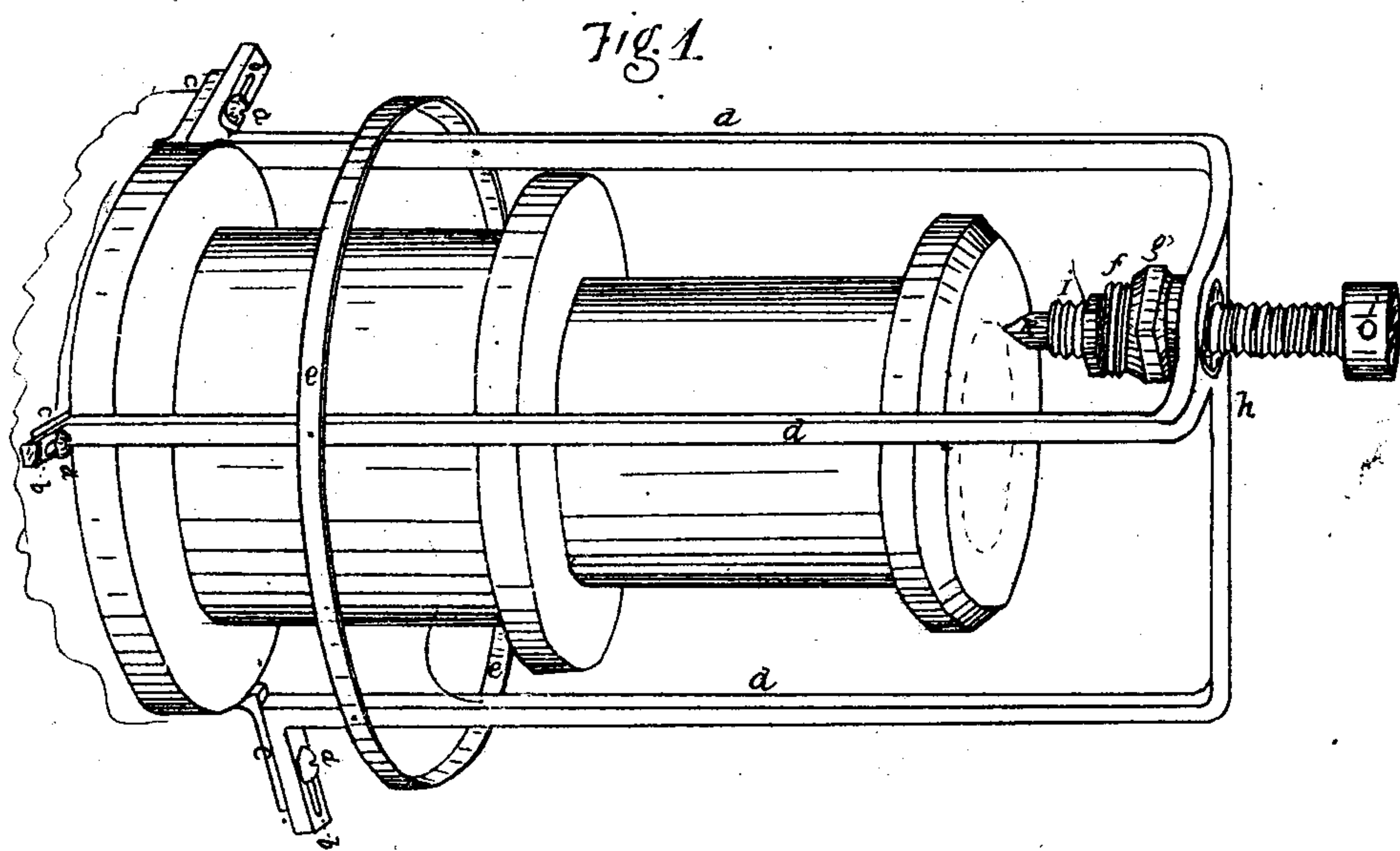


C. J. Clifford.

Determining Deviation of Locomotive-Crank Pins.

N^o 73233

Patented Jan. 14, 1868.



Witnesses:

W. M. Gooding
Edward Collier

Inventor:

Chas J Clifford

United States Patent Office.

CHARLES J. CLIFFORD, OF NEW HAMPTON, NEW JERSEY.

Letters Patent No. 73,233, dated January 14, 1868.

IMPROVED APPARATUS FOR DETERMINING DEVIATION OF LOCOMOTIVE-CRANK PINS FROM TRUE CENTRE.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, CHARLES J. CLIFFORD, of the town of New Hampton, in the county of Hunterdon, and State of New Jersey, have invented an instrument for ascertaining, without centring or quartering the wheels, whether or not the crank-pins in locomotive driving-wheels are bent or sprung; and I declare the following to be a full and exact description of the same, reference being had herein to the drawings that accompany this specification, as part of the same, in which—

Figure 1 is the instrument in its position on a crank-pin, as when in use.

Figure 2 is a sectional view of the combined screws and spring-marking point, displaying their adjustability; and

Figure 3 is one of the feet of the instrument, showing the means of adjusting them to the varied diameters of crank-pins at their bases.

Preparatory to inserting the crank-pin in the wheel, a part of the wheel is faced off, and a hole is bored precisely at a right angle to the facing. This facing never varies. By using three arms to support three adjustable feet, with points, and applying those points to the facing on the wheel, a true base is had for the operation of the instrument. The ends of the arms *a* are set at an angle, and have thereon the slots *b*, to which the slide *c* is fitted, being held in position by the set-screw *d'*. The arms are held equidistant, nicety not being requisite, by the ring-brace *e*, which brace is also the part of the instrument held in the hands of the operator when he presses the points on the feet of the slides *c* against the facing on the wheel, close to the base of the crank-pin. The other ends of the arms *a* are connected by a disk or by braces, in which, somewhat aside from the centre, the combined screw and spring-marking point is placed. To allow of adaptation to crank-pins of varied lengths, the large screw *f* is provided with a thread through or a nut inserted in the disk or braces, and with a jam-nut, *g*, that can be put on either side of the disk or braces *h*. The screw *i* passes through the screw *f*, having a corresponding thread inside *f*, and a jam-nut, *j*, against the end of *f*. The screw *i* is also tubular, having in its interior the shank of the marking-point *k*, with the spring *l* keeping the point up to the shoulder *m*. When the instrument is turned round by the operator, the marking-point not being in the centre, describes a circle on the outer end of the crank-pin, the spring-marking point accommodating itself to whatever incline or irregularity there may be on the end of the crank-pin. By the relative position of the circle described to the old centre, upon which the pin was originally turned, can easily be determined to what degree and in what direction the pin is bent or sprung.

I claim as a new article of manufacture—

The instrument for ascertaining, without quartering or centring, whether or not crank-pins on locomotive driving-wheels are bent or sprung, constructed with the arms *a*, feet *b*, brace *c*, adjusting-screws and spring-marking point, fig. 2, all arranged and combined substantially as shown and specified.

Witnesses:

W. M. GOODING,
EDWARD COLLVER.

CHAS. J. CLIFFORD.