

(No Model.)

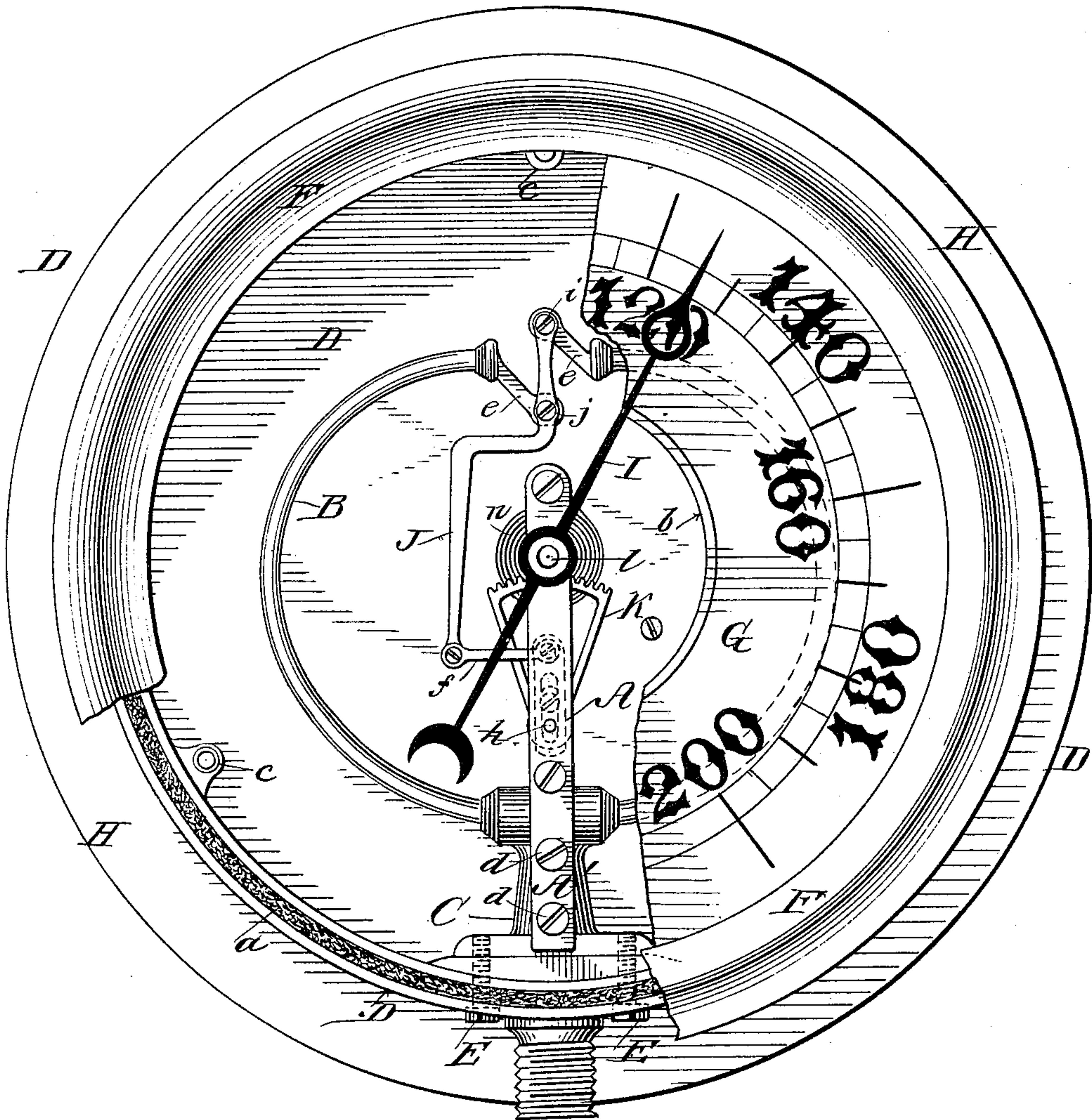
2 Sheets—Sheet 1.

M. LUSCOMB.  
VACUUM OR PRESSURE GAGE.

No. 403,543.

Patented May 21, 1889.

*Fig. 1.*



WITNESSES:

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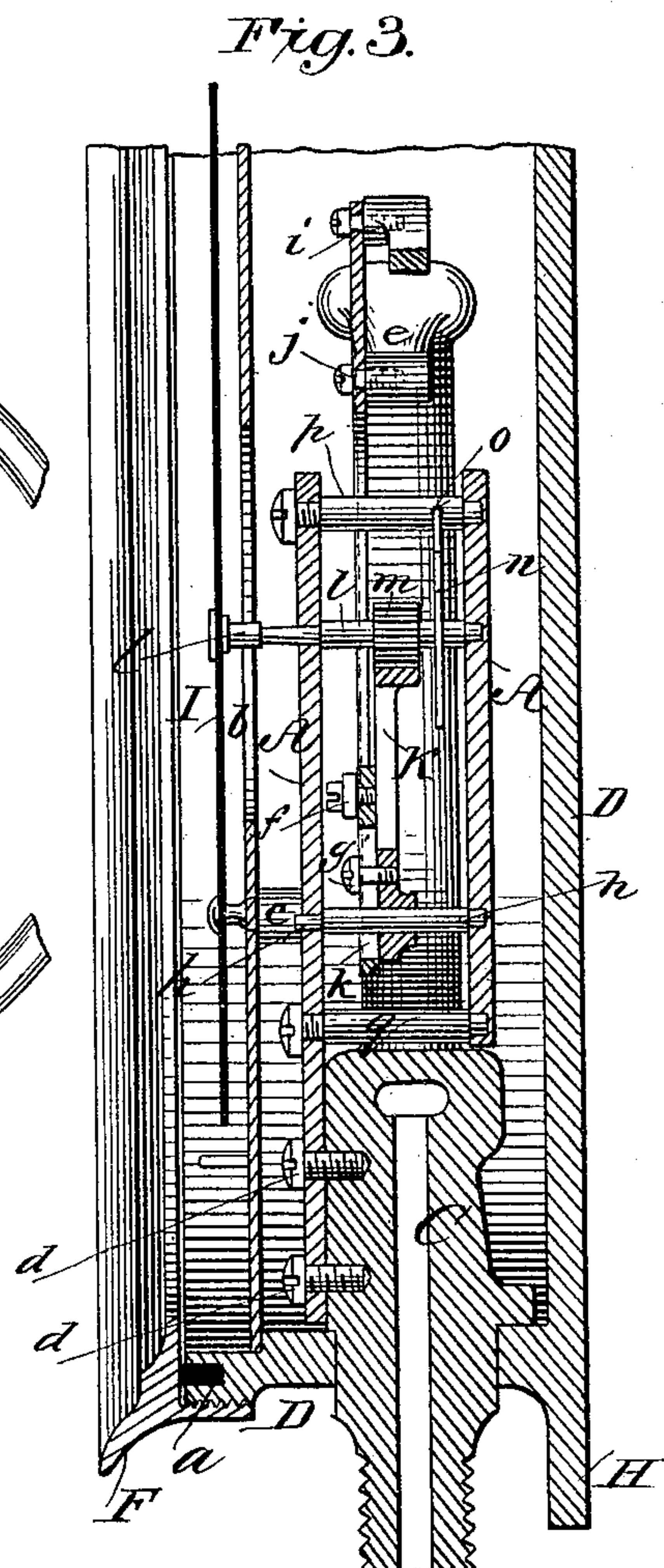
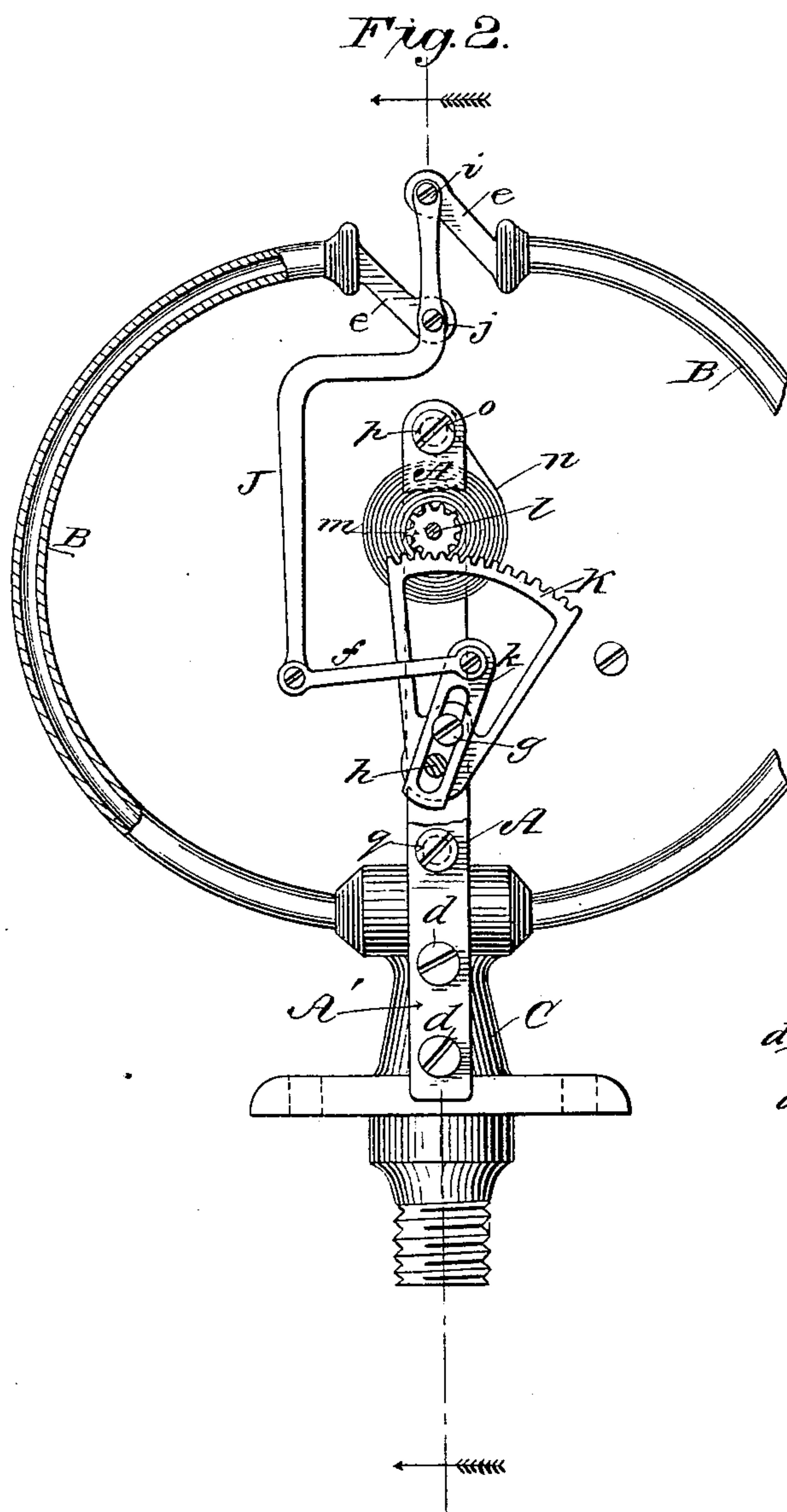
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2 Sheets—Sheet 2.

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# UNITED STATES PATENT OFFICE.

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## VACUUM OR PRESSURE GAGE.

SPECIFICATION forming part of Letters Patent No. 403,543, dated May 21, 1889.

Application filed January 19, 1888. Serial No. 261,299. (No model.)

*To all whom it may concern:*

Be it known that I, MARTIN LUSCOMB, a citizen of the United States, residing at Bridgeport, county of Fairfield, State of Connecticut, have invented certain new and useful Improvements in Vacuum or Pressure Gages, of which the following is a specification.

My invention relates to gages in which the Bourdon tube is employed to operate the index; and my object is to so dispose the operative parts of the mechanism and locate the pivots as to prevent deflection by jarring motions, especially in the vertical direction, such as may occur to the instrument when used on portable steam-generators or locomotives; and in order to enable others to understand and use my said invention I will proceed to describe the construction and operation of the devices whereby I obtain the above results, and subsequently point out in the appended claim such characteristic features as I believe to be novel.

Referring to the accompanying drawings, forming a part of this specification, and in which like reference-letters indicate corresponding parts, Figure 1 is a front elevation of a pressure or vacuum gage with the dial partly removed; Fig. 2, an enlarged front elevation of the tubes and transmitting mechanism with a portion of the latter's framing structure removed; and Fig. 3, a vertical central section of the gage on the same scale as Fig. 2, viewed in the direction of the arrows thereon.

The supporting-frame A A for the transmitting mechanism and the indicating-tubes B B form an independent structure projected from an anchorage, C, which is fastened to the exterior casing, D, in any suitable manner, as by screws E, or to any other point of support, irrespective of said casing. An independent structure of the essential parts is thereby obtained, and the whole inclosed within the usual casing, which is functionally a protector from dust and moisture, and not a supporting medium, and such fastenings of the latter, as screws through the flange H, that may spring the back, will not affect the interior mechanism. The back and rim of the case are integral, and the front composed

of glass, confined at the margin upon a felt packing, *a*, by the screw-threaded rim F. The dial-plate G is held by the lugs *c* on the casing D, and is open at *b*, leaving the index I and its shaft free therefrom. The frame A A is secured to the anchor C by an extremity, as A', of preferably one of its bars, the same being readily removable by screws *d*.

The semicircular indicating-tubes B B are symmetric, of equal resiliency, and directly opposite one another at their free ends, whereby such deflections as may arise by external shock will be equally shared. The free ends of the tubes are, furthermore, located in vertical line above their fixed ends, reducing as far as possible the influence of vertical shock.

The lever J is pivoted to the free ends of the tubes at the vertically-different points *i j* necessary to obtain a proper range of motion by employment of the offset-arms *e*, obviating the necessity of using tubes of unequal length, as common in practice. The lever J is offset to allow space for the length of the connecting-bar *f* beneath, and to permit its connection to the segment K at a point vertically beneath the pivoting-points *i j*.

The toothed segment K is fulcrumed by its shaft *h*, having bearings in the frame A A, and the connecting-bar *f* operates at an adjustable radius thereon by means of the link *k*, adjusted by a set-screw, *g*, to determine the proper range of movement of the index-shaft relative to that of the tubes.

The index-shaft *l* bears likewise in the frame A A, projecting forward to carry the index I. The teeth of the segment K and index-pinion *m* have long bearing-surfaces, as will be observed in Fig. 3, to promote durability.

The hair-spring *n*, performing the usual function of returning the index-hand as against the action of the tubes, is anchored at *o* to the stay or stud *p*, which latter and the lower stay, *q*, unite the frame A A.

By the foregoing construction the axes of all the pivotal centers of motion are brought approximately into a vertical plane and in operation when the resilient tubes are parted by a desired pressure—that is to say, the average pressure which it is intended the

gage shall carry, say about one hundred and twenty pounds—the segment will assume its mid-position, being balanced thereby, as in Fig. 1. In this position the gravity of the segment is equalized on both sides of its fulcrum, and thereby free from any tendency to deflect by vertical shock. The horizontal movement of the free ends of the tubes as distinguished from the vertical, which occurs in the path they describe, is alone utilized to perform the range of indication, and at the desired pressure the pivots *i j* come accurately into the common vertical plane aforesaid, being at other times approximately so, and a vertical shock to the tubes will therefore impart no lateral movement to the lever *J* nor to the index.

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

In a vacuum or pressure gage, the combination of the index pinion-shaft, the pivoted toothed segment, and the pivoted lever connecting the free ends of the tubes, said pivotal bearings being supported independent of the casing, the respective axes of such parts being adjusted in a vertical plane; and the stroke of the segment adjusted to assume a balance position when the index indicates a desired pressure indication, as set forth.

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Witnesses:

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