

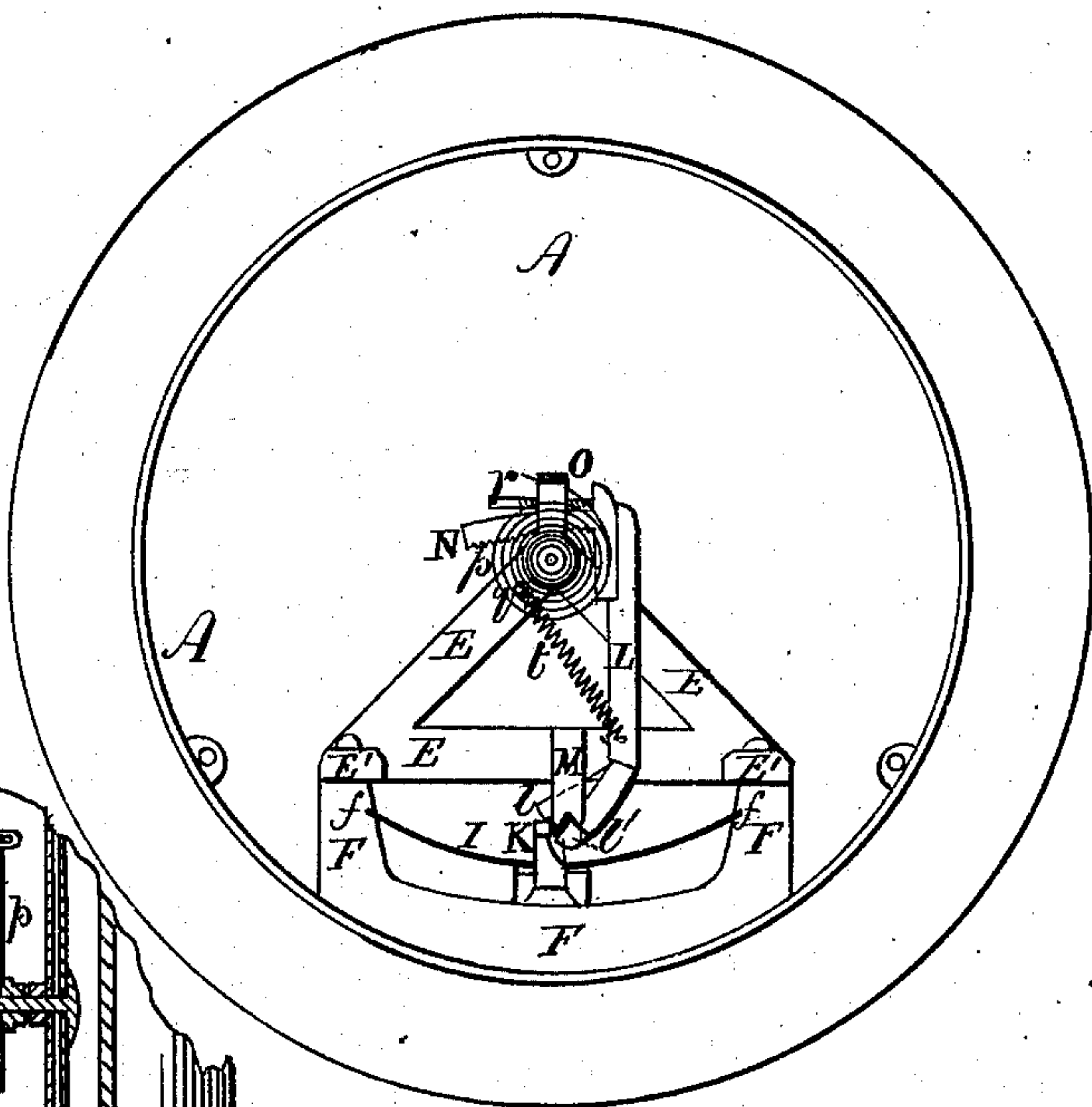
(Model.)

J. BURRELL,  
Steam Pressure Gage.

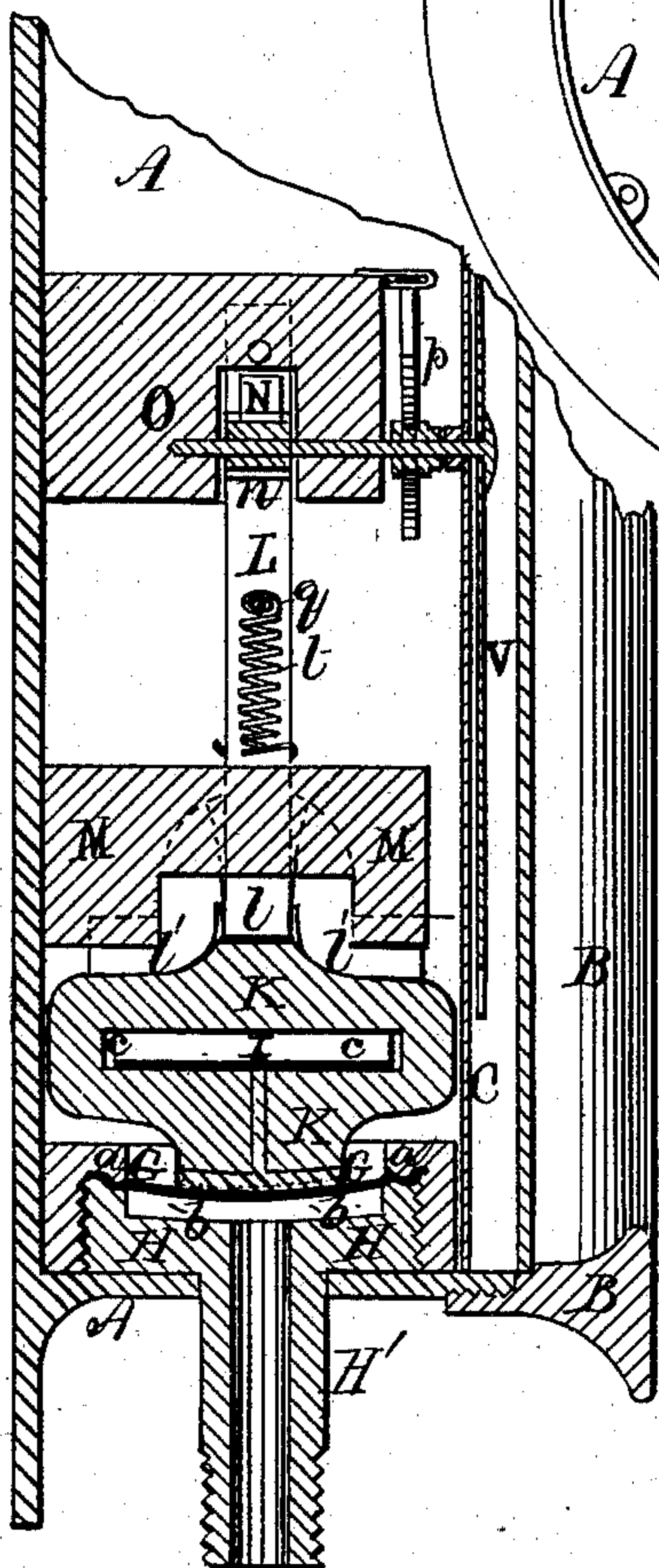
No. 237,243.

Patented Feb. 1, 1881.

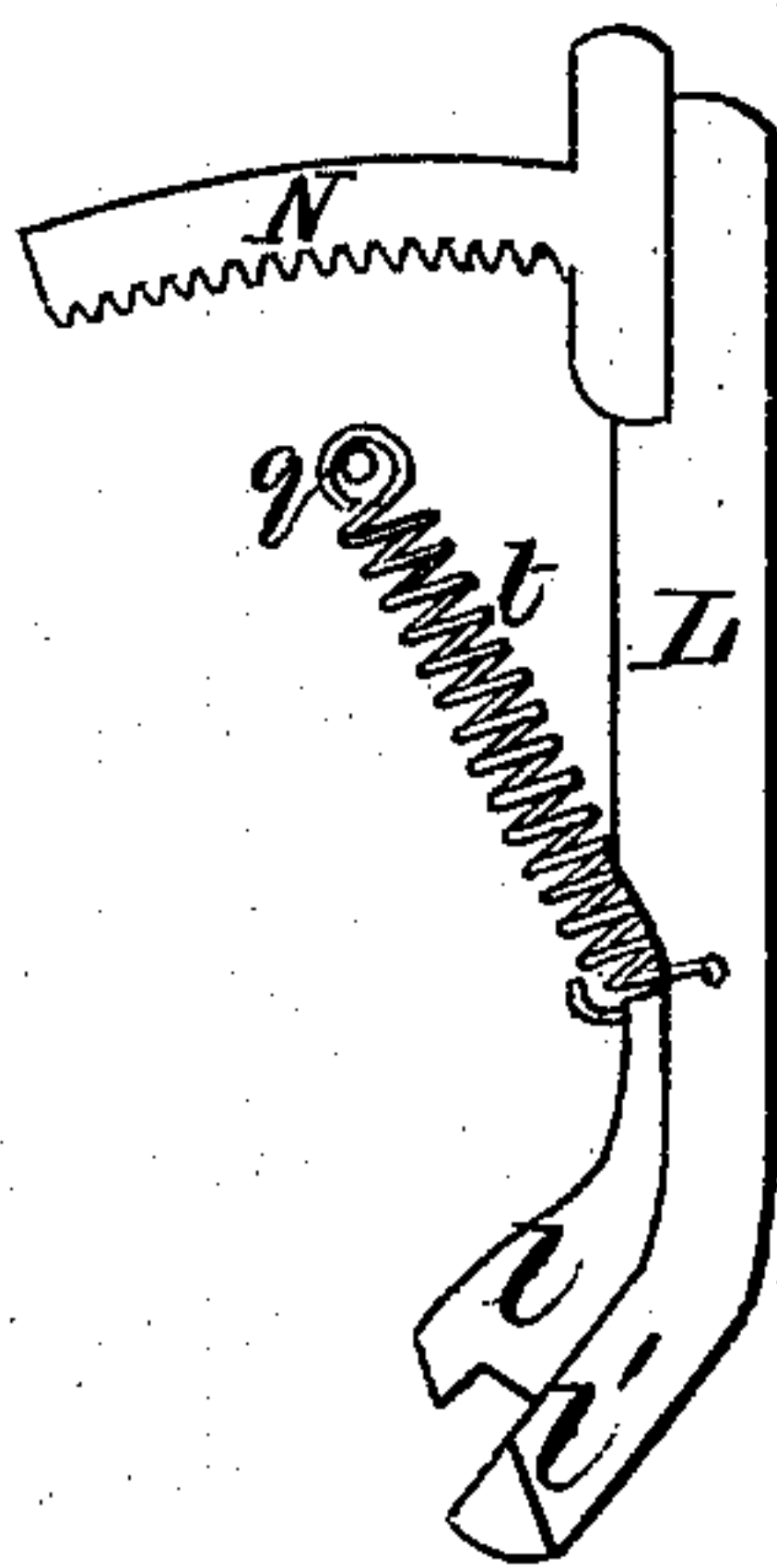
*Fig. 1*



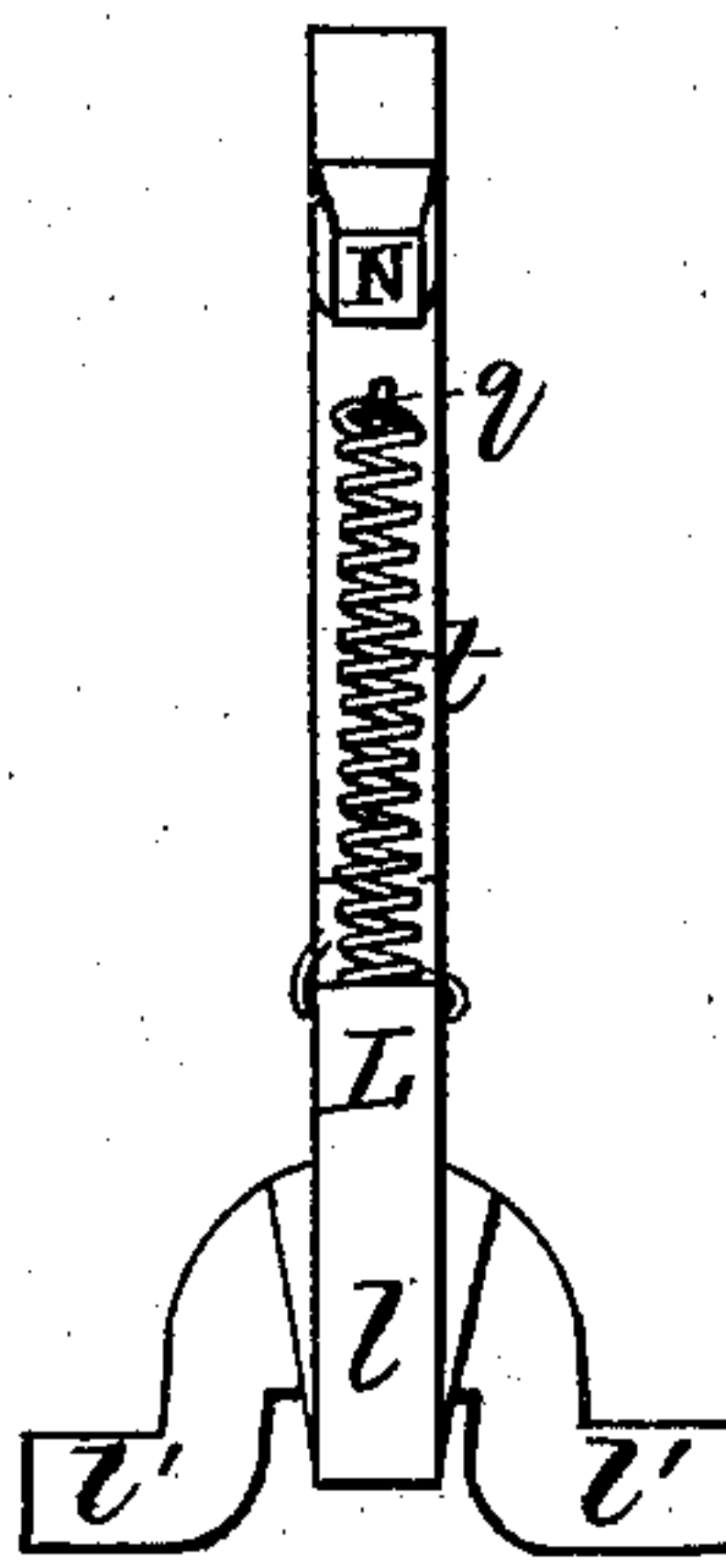
*Fig. 2*



*Fig. 3*



*Fig. 4*



Witnesses  
W. C. Linn  
R. L. Putnam

Inventor  
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# UNITED STATES PATENT OFFICE.

JARVIS BURRELL, OF EAST BRIDGEWATER, ASSIGNOR TO GEORGE H. P. FLAGG, OF BOSTON, MASSACHUSETTS.

## STEAM-PRESSURE GAGE.

SPECIFICATION forming part of Letters Patent No. 237,243, dated February 1, 1881.

Application filed September 24, 1880. (Model.)

*To all whom it may concern:*

Be it known that I, JARVIS BURRELL, of East Bridgewater, in the county of Plymouth and State of Massachusetts, have invented certain Improvements in Steam-Gages, of which the following is a specification.

Figure 1 of the accompanying drawings is a front view of the interior of my improved gage. Fig. 2 is a central transverse vertical section of the same. Figs. 3 and 4 are respectively a side and front view of parts, in detail, of my invention.

The object of the present invention is to effect certain new and useful improvements in steam or pressure gages, but more particularly to obviate objections in an invention of like nature for which Letters Patent No. 101,636 were granted to James W. Maloy, April 5, 1870. In the patented invention referred to inaccuracy in the operation of the gage is apt to occur, mainly owing to the dependency of the lever for its action on separate bearings or fulcrums—that is, the stem of the button, which is movable and subject to slight variation, is very liable to vary in its distance from the fixed knife-edge or fulcrum on which the lever vibrates, thereby causing an uncertain measurement of the pressure; and, further, the curved spring is weakened so as to frequently break by having an aperture formed through its center to admit the stem of the button, and the ends of the spring are made to abut at the joints of the casting, which is liable to give way and forms a movable and uncertain bearing.

These objections are obviated by my improvements, which consist, mainly, of a lever having knife-edge fulcrums and bearing cast in one piece with it, and arranged, as will be hereinafter more fully described, to be operated by one action.

These improvements otherwise consist in varying the construction of several of the devices of the gage to perform their required functions in a more perfect manner, all of which I will now proceed to describe.

In the drawings, A represents a metallic casing having a glazed screw-cover, B, and a suitably-marked dial-plate, C, and having attached within a triangular metallic frame, E, formed with bottom projecting plates, E', screwed to the top of the vertical sides of a

casting, F, curved on its top and bottom and formed with an upper central annular or other recess, having an under-grooved rabbet or shoulder, *a*, to receive a flexible slightly-curved concave or other disk or plate, G, which is held steam-tight against the shoulder *a* by a screw-head, H, countersunk on the top to form a chamber, *b*, for the steam or pressure to enter against the plate or disk G, and also to form a rim having its top shaped to follow the disk into the groove of the shoulder *a*, or the disk may be otherwise held, as preferred. The screw-head H is formed with a central aperture opening into the chamber *b* and extending through an outward stem or steam or pressure tube or pipe, H'. The interior sides of the casting F are notched or grooved laterally at *f* to receive and firmly hold the ends of a concavely-curved spring, I, which passes through a transverse slot, *c*, of a yoke, K, whose bottom or button-like portion abuts on the top, so as to receive the action of the disk or plate G; and the top of the yoke is curved upward from the ends to form a central bearing or seat for the knife-edge of an arm, *l*, projecting forward of and centrally between lateral extending arms or fulcrums *l'* curving downward from on either side of a vertical lever, L, and each fulcrum formed with an upper knife-edge bearing in grooves formed in the bottom of a bearing or plate, M, projecting at a right angle from the bottom of the frame E and cut out in the center of its lower portion to admit the projection of the center arm, *l*.

Connected with the top of the lever L is a segmental ratchet-bar, N, whose teeth mesh with a pinion, *n*, turning in a bearing, O, slotted to receive and allow the action of the ratchet and pinion, and projecting at a right angle from the top of the frame E, upon which it is cast. The arbor of the pinion is provided with a watch or other spring, *p*, and extends through the dial-plate, outside of which it is provided with an index, V.

Located above the ratchet N, and operating through the bearing O against the lever L, is a screw pin or stem, *r*.

Projecting from the frame E is a rod, *q*, which holds one end of a coiled spring, *t*, whose other end is connected with the lever L.

Pressure being admitted through the pipe



H' into the chamber *b*, acts on the plate or disk G and bears it against the button or bottom portion of the yoke K, which is raised thereby and bears up the arm *l*, which vibrates partially the lever L, whose lateral arms or fulcrums *l'* 5 act in the grooved or notched bottom of the bearing M and actuate the ratchet and pinion and operate the index over the dial-plate to the point determined by the amount of pressure exerted. The spiral spring *t* 10 serves to secure the required tension to the lever L, and the spring I supplies the required tension to the yoke K.

By means of the regulating screw stem or 15 pin *r* the distance of the throw of the lever may be varied to regulate the movement of the index, so that it shall always start from the zero or starting point.

By the above description, reference being 20 made to the drawings, it will readily be seen that the action of the lever must be accurate under any variation of pressure or circumstances, as its bearing and fulcrums are formed on it, and there is nothing to vary their dis- 25 tances, as there is in the previous invention, where the lever turns on a fixed fulcrum connected with the frame, and its bottom arm bears on a movable bearing or fulcrum formed by the stem of the button.

By the regulating-stem *r* the lever may be 30 adjusted in its movement to always start the index from the required point, thereby preventing inaccuracy in the measurement, otherwise liable to occur by the index being carried be- 35 yond or not quite to the starting-point.

By extending the spring I through the yoke K the weakness occasioned by the aperture for the button-stem in the invention is prevented; and by notching the sides of the casting F to 40 receive the ends of the spring I, instead of abutting the ends at the joints of the casting, as heretofore mentioned, the spring is more

securely and steadily held and more accurate in its operation.

By my improvements I insure a more per- 45 fect operation without increasing the expense of the gage.

A steam-gage has heretofore been made in which the index-moving lever has been pro- 50 vided with a removable or separable pivot to rest upon the diaphragm below, and a pin extended through its lower end, on both sides, to engage notches in a casting from above.

Having thus described my improvements, 55 what I claim as my invention, and desire to have secured to me by Letters Patent, is—

1. In a steam-gage having a flexible disk, G, and a movable yoke, K, resting upon said disk, a lever, L, for operating the index, cast 60 in one piece with a central extension, *l*, having its bearing upon the movable yoke, and laterally-projecting arms *l'*, combined with the casting M, against which said arms bear, substantially as shown and described.

2. In a steam-gage, the disk G, the yoke K, 65 loosely placed thereupon, the bearing F, notched at *f* to receive the spring I, the bearings M, the one-piece furcated lever L, and an index or indicating mechanism, combined and arranged to operate substantially as described. 70

3. The disk G, the yoke K, loosely placed 75 thereupon, the imperforate spring I and its bearings F, for supporting the yoke, the bearings M, the forked lever L, and an index or indicating mechanism, combined and arranged substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two sub- scribing witnesses, this 21st day of Septem- ber, A. D. 1880.

JARVIS BURRELL.

Witnesses:

C. F. BROWN,

JOSEPH F. BALDWIN.