

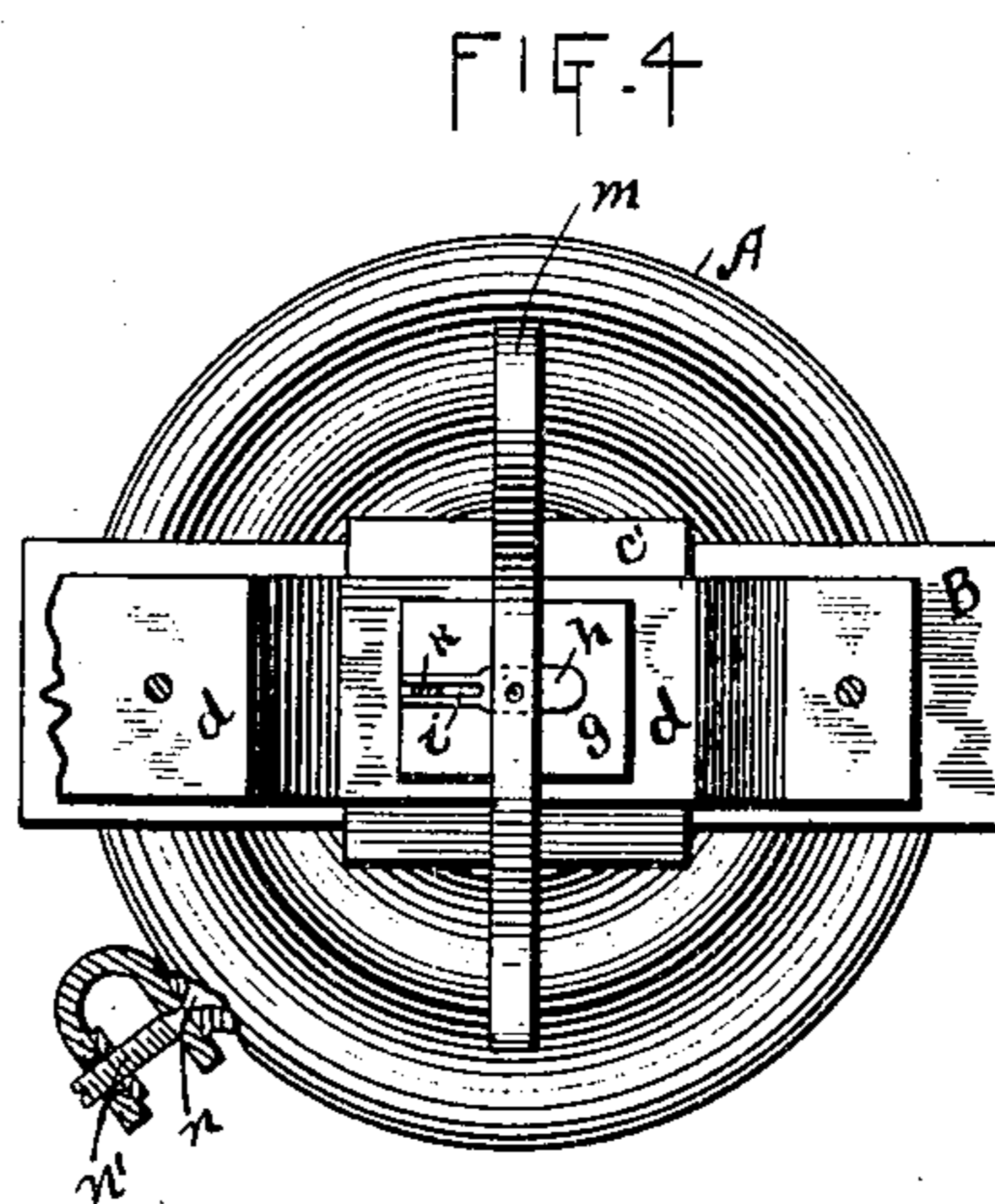
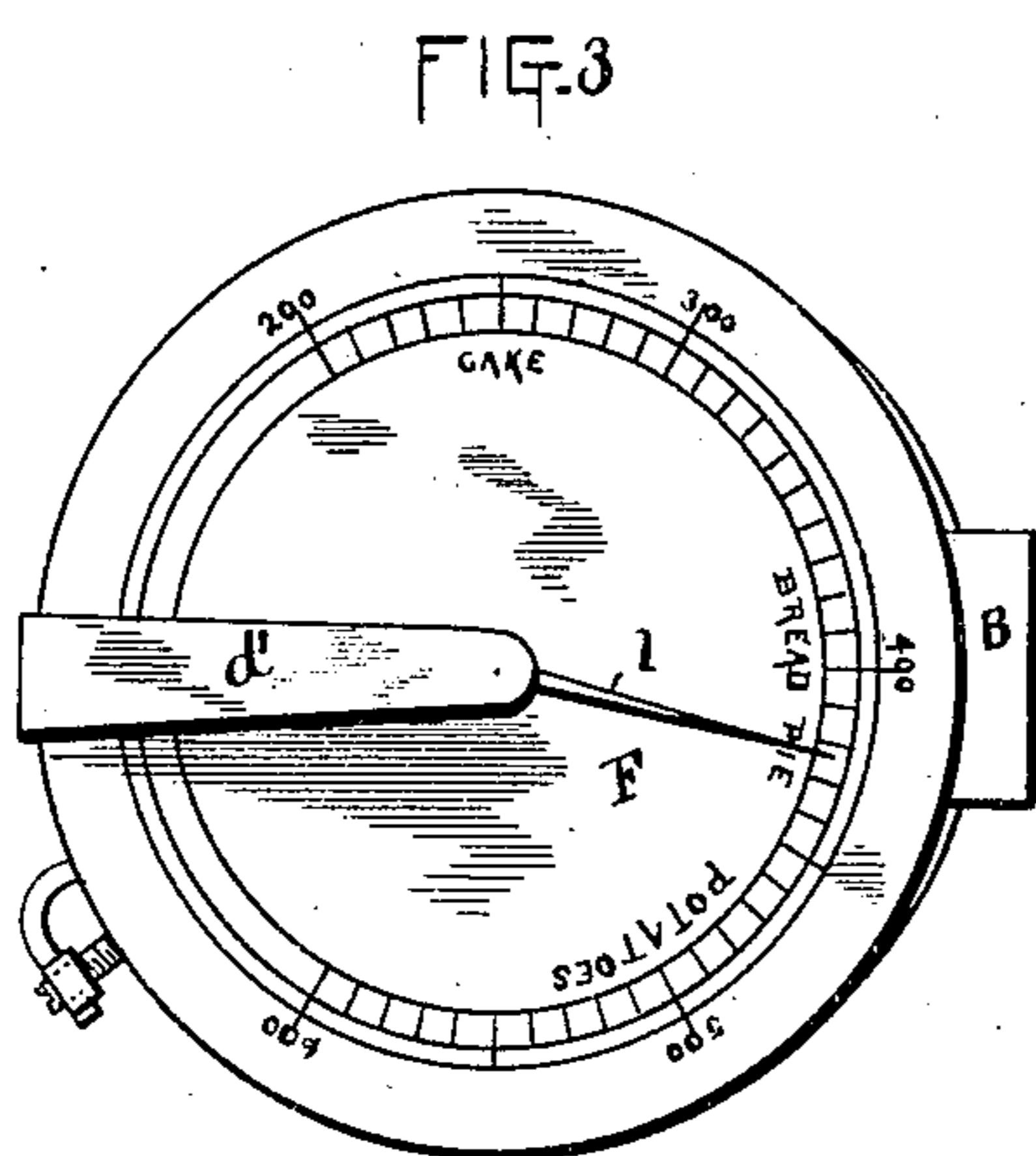
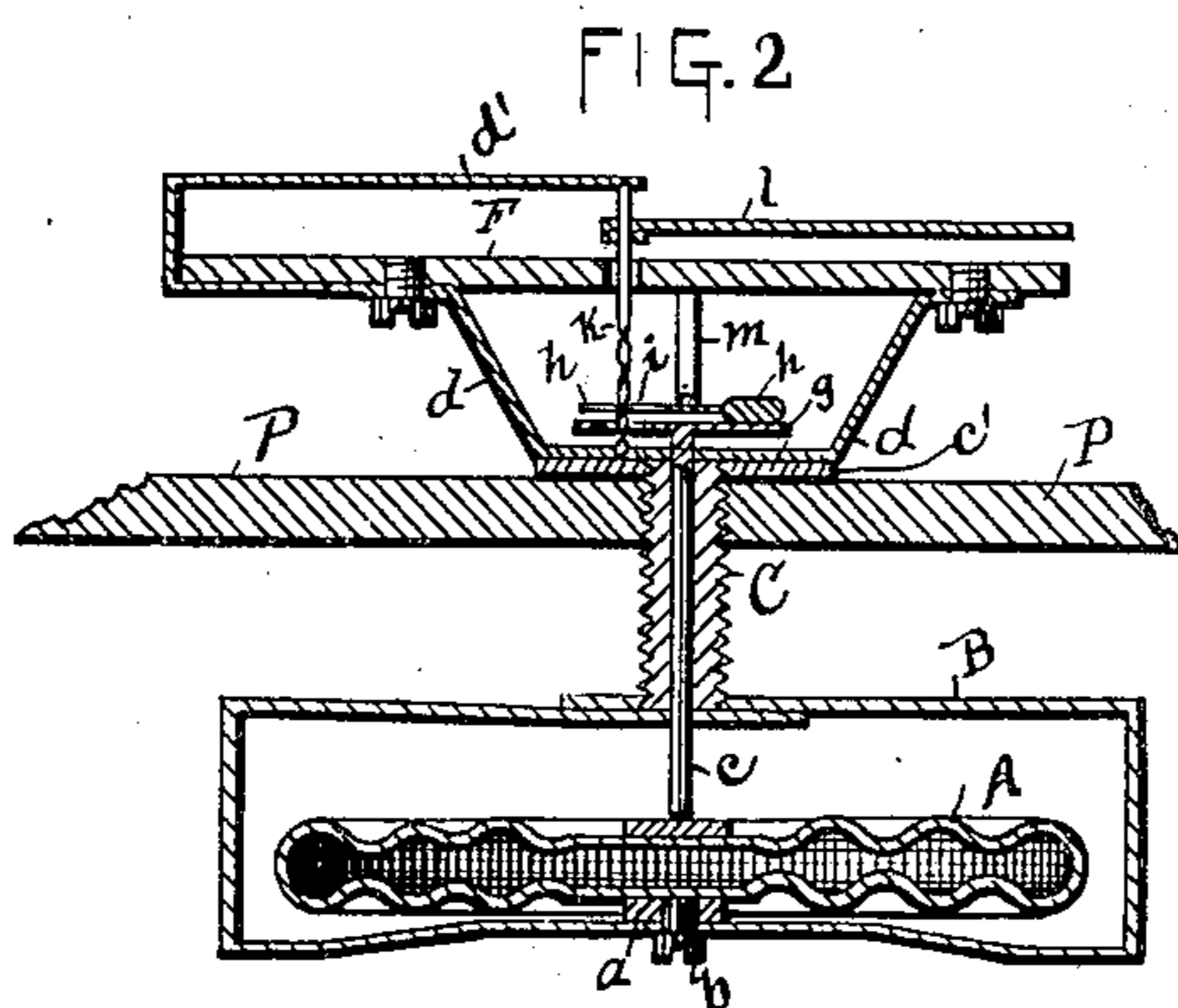
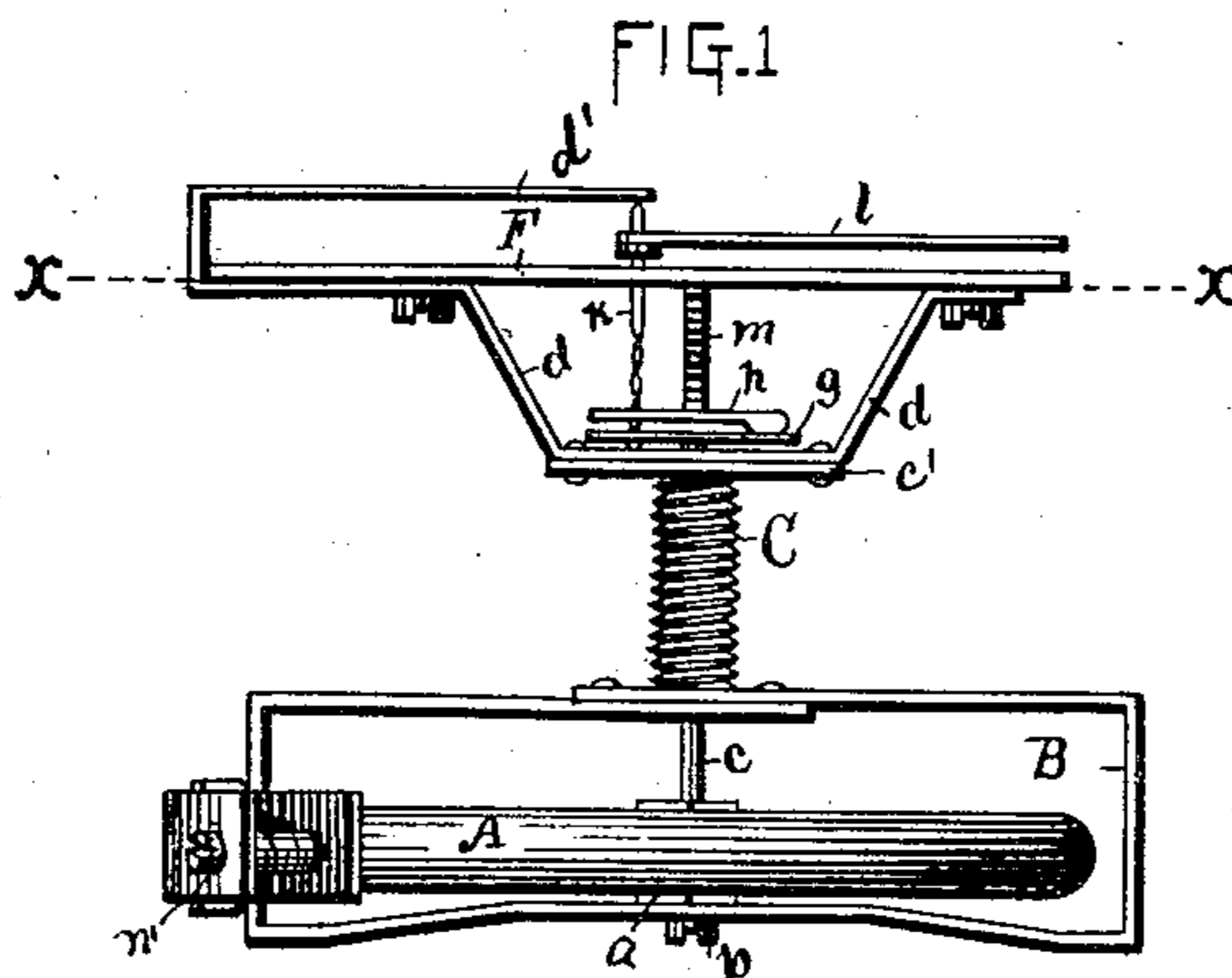
(No Model.)

H. HENDERSON & F. N. JOHNSTON.

OVEN THERMOMETER.

No. 397,127.

Patented Feb. 5, 1889.



WITNESSES:

Geo. B. Farnel.

Ora S. Koehne.

INVENTOR:

Homer Henderson  
Frank W. Johnston

BY

C. C. Shepherd

THEIR ATTORNEY

# UNITED STATES PATENT OFFICE.

HOMER HENDERSON AND FRANK N. JOHNSTON, OF COLUMBUS, OHIO.

## OVEN-THERMOMETER.

SPECIFICATION forming part of Letters Patent No. 397,127, dated February 5, 1889.

Application filed April 30, 1888. Serial No. 272,376. (No model.)

*To all whom it may concern:*

Be it known that we, HOMER HENDERSON and FRANK N. JOHNSTON, citizens of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Pyrometers, of which the following is a specification.

Our invention relates to the improvement of pyrometers, and especially relates to that class of pyrometers used in determining the heat of ovens.

The objects of our invention are to produce a pyrometer or oven-heat indicator constructed in a simple and inexpensive manner, and in such form as to facilitate its attachment to any of the ordinary forms of stoves; and to so construct the same as to cause, by the expansion of air, an indication upon a dial of the degree of heat attained within the oven, and an indication upon said dial of the proper degree of heat for cooking different articles enumerated thereon. These objects we accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of our improved pyrometer. Fig. 2 is a vertical central section of the same. Fig. 3 is a view of the face of the dial. Fig. 4 is a plan view taken on line *xx* of Fig. 1, and Fig. 5 is a detail view of the indicator-hand post.

Similar letters refer to similar parts throughout the several views.

A represents a flattened disk-shaped air-chamber formed of any desirable thin metal, and having, as shown, its upper and lower sides grooved or corrugated for the purpose hereinafter specified. This chamber A is located within an oblong metallic frame, B, against the rear portion of which it is supported by means of a screw, *b*, made to pass inwardly through said rear frame-piece and enter a screw-hole formed in a central lug, *a*, secured to or formed with the bottom plate of the air-chamber A.

C represents a hollow screw having its rear end secured to the front side of the frame B at a point opposite the center of the chamber A, and having its outer or front end screwed into a screw-hole formed in a square head-plate, *c'*. Secured by rivets or otherwise to the outer side of this plate *c'* is the corre-

spondingly-shaped base of a metallic frame-plate, *d*, to the forwardly-extending sides of which is secured a circular dial-plate, F. Made to pass loosely through a central hole formed in the outer side of the frame B, through the hollow center of the screw C, and through oppositely-located holes formed in the screw-head plate *c'* and the base of the frame-plate *d*, is a pin, *e*. The rear end of the pin *e* is adapted to bear against the center of the outer side of the chamber A, while its outer end is provided with a head-plate, *g*.

Secured to the outer side or face of the pin-head plate *g*, near one side thereof, is the enlarged end of a metal strip, *h*, which extends across and slightly above the plate *g*, and is provided, as shown, with a longitudinal slot, *i*.

The frame-plate *d* is provided at one end with a continuation, *d'*, which extends upward and thence inward over half the diameter of the dial F to a point opposite and in front of the center of the dial. Pivotaly supported between the outer end of this frame continuation and the base of the said frame, and passing loosely through a central opening in the dial, through the slot *i* of the strip *h*, and through a hole formed in the pin-head *g*, is a twisted metal strip or spirally-grooved shaft forming an indicator-hand post, *k*.

Fixed on the indicator-hand post *k*, between the dial and the end of the frame continuation *d'*, is an indicating-hand, *l*.

*m* represents a curved metallic spring-strip secured at the center of its length to the upper side of the slotted strip *h*, and having its outer ends bearing against the rear side of the dial-plate F.

Engraved, printed, or otherwise made to appear upon the face of the dial F at proper points, arranged in a circular line thereon, are figures and marks designed to represent different degrees of heat. Opposite each of these numbers or marks is printed the name or names of the article which has been found to cook best when the atmosphere within the oven is heated to that degree. The chamber A having been filled with air, the air-opening *n* may be closed by any suitable form of valve, *n'*, or may be sealed in any well-known manner.

The operation of our device is as follows: A screw-hole having first been formed in the

oven-door P or other desirable point in the wall of the oven, and the frame *d* being unscrewed from the outer end of the screw C, the latter, having the frame B secured thereto, as described, is screwed into said oven-door hole from the inner side thereof until its outer end projects sufficiently outward from the face of the oven-door to admit of the attachment thereto of the frame *d*, the pin *c* being first inserted into the hollow of the screw. As the air within the oven becomes heated, it will be seen that the temperature of the air contained within the chamber A will likewise be increased, and by being thus heated will be caused to expand. The expansion of the air within the chamber will cause the outer side or outer diaphragm of the latter to be forced outward. The contact of the rear end of the pin *c* with said diaphragm will operate to force outward said pin and its head *g* and strip *h*, secured thereto. The slot of the strip *h* is of such width as to admit of the passage therethrough of the twisted hand-post only when the latter is so turned that its flattened or thinnest portion is in the direction of the length of the slot.

It will readily be seen that the above-described outward movement of the strip *h* will cause the edges of said twisted post to come into contact with the edges of the slot *i* of said strip and cause said post to revolve, and the revolution of said post will cause the indicating-hand to move in the arc of a circle from point to point upon the dial as the expansion of the air within the chamber A is increased. It will also be seen that as the air becomes cooler the contraction thereof will cause the outer faces of the chamber to gradually resume their normal position, thus releasing the pin *c* from pressure therefrom and allowing it, through pressure of the spring-strip *m*, to be forced backward. This movement of the pin *c* through its head *g* and slot-

ted strip *h* will operate to reverse the movement of the hand-post and its hand.

It is obvious that a suitable connection may be formed between the rear end of the pin and the outer face of the air-chamber, in order that any forward or backward movement of the former may produce a similar movement of the pin *c*, thus obviating the use of the spring-strip *m*. Forms of framework differing from that herein shown may also be used.

The thin faces or diaphragms of the chamber A being, as shown, bent inwardly and outwardly to form corrugated surfaces, a greater expanding or distending surface is attained.

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

1. The combination, with the air-chamber A, supported in a frame, B, of the spring-actuated pin *c*, bearing against the face of said chamber, and having guide-head *g* and slotted strip *h*, dial-plate F, and twisted hand-post *k*, carrying hand *l* and pivotally supported in the frame of said dial, substantially as and for the purpose specified.

2. The combination, with the air-chamber A, supported within a frame, B, and the hollow screw C, secured to said frame, of a dial-plate, F, having figures and letters thereon, as described, and having its supporting-frame detachably connected with the screw C, pin *c*, passing through screw C and frames *d* and B and having guide-head *g* and slotted strip *h*, and twisted hand-post *k*, carrying indicator-hand *l*, substantially as and for the purpose specified.

HOMER HENDERSON.  
FRANK N. JOHNSTON.

In presence of—

C. B. CURRIER,  
C. C. SHEPHERD.