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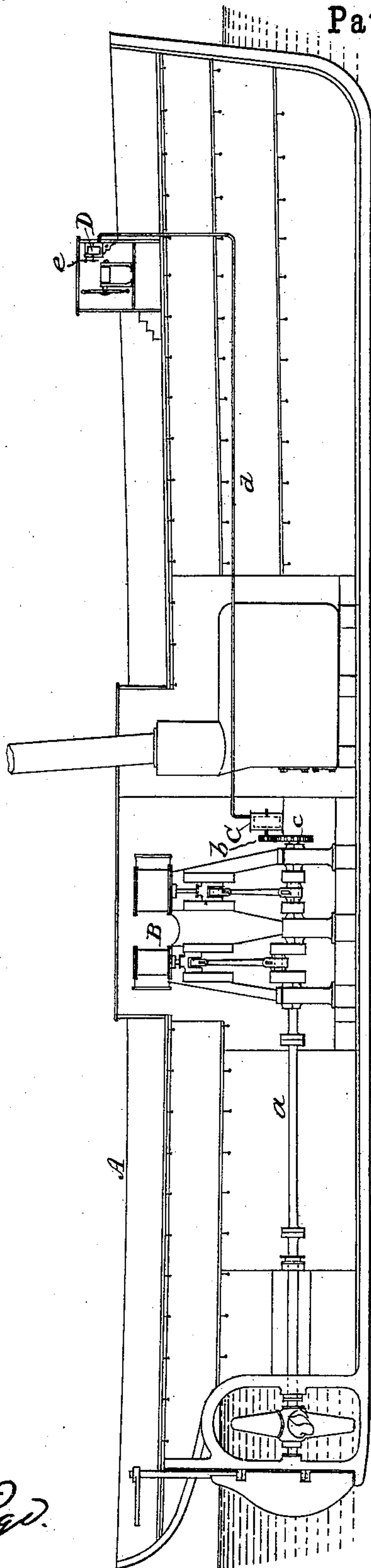
2 Sheets—Sheet 1.

G. W. BAIRD.  
PNEUMATIC INDICATOR.

No. 343,530.

Patented June 8, 1886.

*Fig. 1.*



Witnesses:

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Inventor:

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*By J. C. Crichton*

*Attorney.*

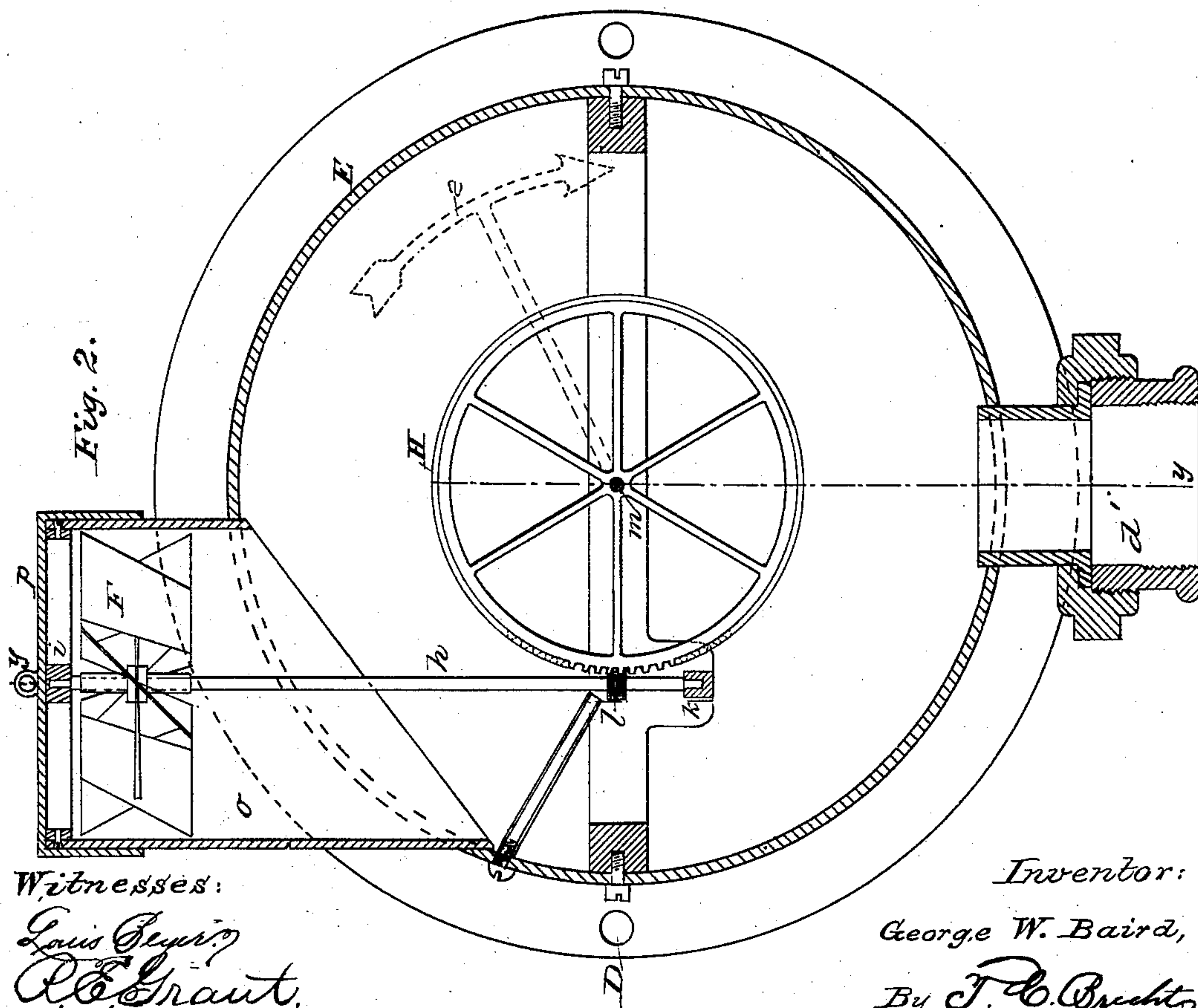
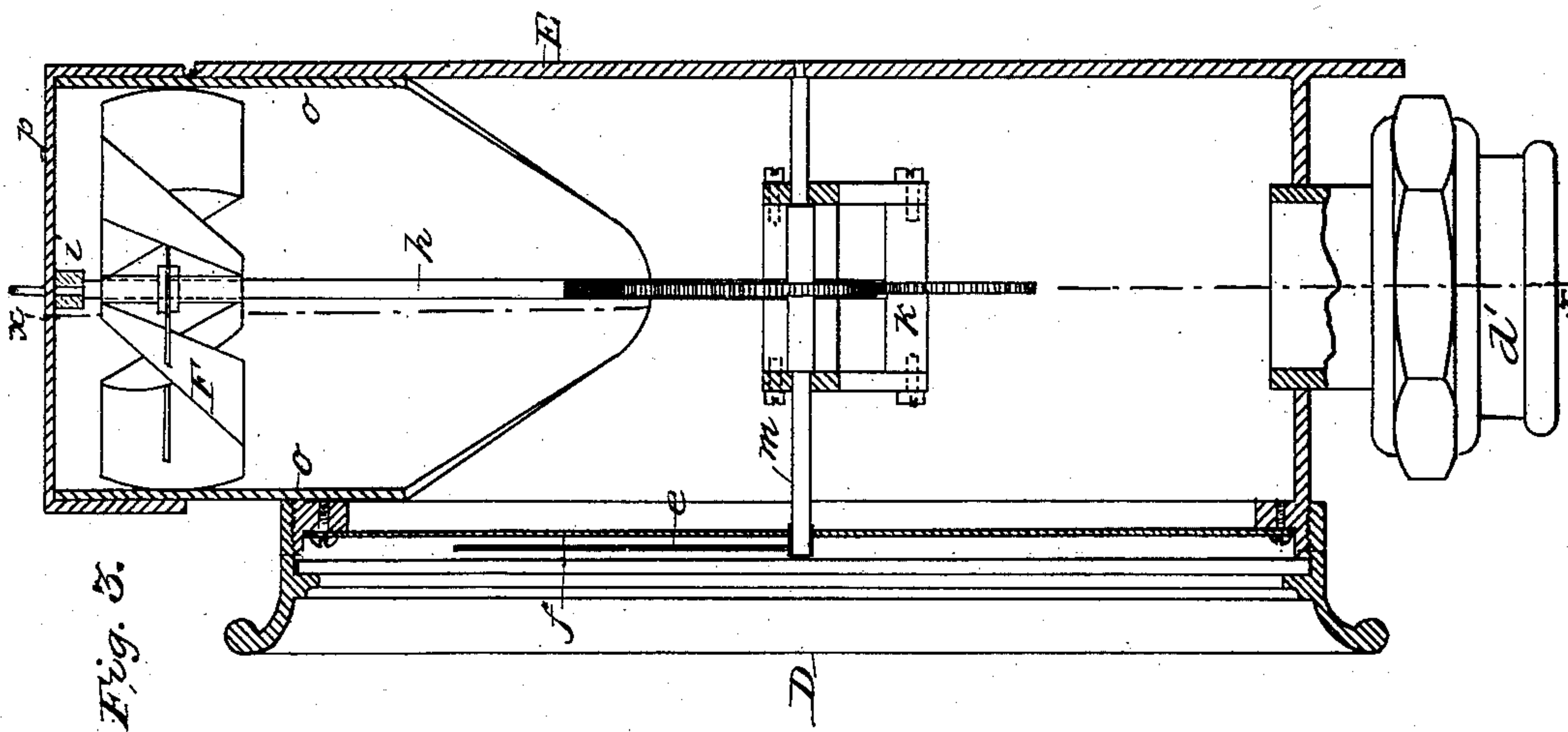
(No Model.)

2 Sheets—Sheet 2.

G. W. BAIRD.  
PNEUMATIC INDICATOR.

No. 343,530.

Patented June 8, 1886.



Witnesses:

Louis B. Grant,  
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Inventor:

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# UNITED STATES PATENT OFFICE.

GEORGE W. BAIRD, OF WASHINGTON, DISTRICT OF COLUMBIA.

## PNEUMATIC INDICATOR.

SPECIFICATION forming part of Letters Patent No. 343,530, dated June 8, 1886.

Application filed October 18, 1884. Serial No. 145,902. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE W. BAIRD, of the United States Navy, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Pneumatic Indicators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in pneumatic indicators; and the object is to produce an apparatus which indicates automatically at one or more points in a ship, factory, mill, or any other place the fact whether or not an engine or machine is moving in one or the other direction or standing still, being principally intended for ships or vessels, also to indicate said fact almost instantaneously and with certainty.

The invention consists in certain details of construction and arrangement of parts, as will be more fully described hereinafter, and specifically pointed out in the claims, reference being had to the accompanying drawings, and the letters of reference marked thereon.

Like letters indicate similar parts in the drawings, in which Figure 1 represents a longitudinal section of a vessel with my improvement in position. Fig. 2 is an irregular vertical section on line *x x* of Fig. 3. Fig. 3 is a vertical section on line *y y* of Fig. 2.

In the drawings, A represents a vessel, of any size and construction, in which are placed the engines B, of suitable proportions and of any well-known variety. The engines represented are connected to a propeller, and are of the upright compound kind. To the in-board end of the main shaft *a* of the engines is connected a motor, C, which may be a rotary or reciprocating pump or blower, and is in this instance operated by gearing *b c*, although pulleys and belts, sprocket wheels and chains, or any other intermediate operating mechanism may be employed. The motor C is connected to and communicates by means of a pipe, *d*, and coupling *d'* with the indicator D. The pipe *d* is preferably a lead pipe, to withstand the working of the ship, and will not crack. The indicator is placed in the pilot-house or other place desired, and serves to

indicate to the inspection of the officer in charge or his assistants the direction of the movement of the engines, whether ahead, aback, or standing still. While the engines are working ahead, an index on the indicator revolves in the direction in which the arrow end points. Upon reversing the engines the motion of the index is reversed, and when standing still the index remains stationary. The indicator consists of a case, E, of which the dial *f* is the face over which the index or pointer *e* revolves and points. The pointer is mounted upon a shaft or spindle, *m*, which carries a gear-wheel, H, meshing with a worm, *l*, secured to the spindle or upright shaft *h*, mounted in bearings *i* and *k*. The shaft *h* carries also a fan, F, consisting of a series of blades or vanes arranged like the blades of a screw-propeller, or like the vanes of the common anemometer.

By means of an air-current, which flows in one direction when the ship's engines are going ahead and in the opposite direction when they are backing, the vanes and their spindle are rapidly revolved, and the proper motion transmitted through the gearing to the index or pointer, thus indicating the movement of the engines or whether they are standing still. The movement of the index is moderate in speed; but the speed is variable with the speed of the engines, and incidentally affords a means for estimating by the eye the speed as well as the direction of the movement of the engines and the ship. The air-current is derived from the pump or blower near the engines, and operated as before stated. When moved in one direction, the motor draws the air from the vanes of the indicator through the pipe *d*, connected by coupling *d'* to said indicator, which has an opening, *o*, at one extremity, forming a mouth, in which said vanes revolve, and when moved in the opposite direction the air is driven through the pipe to the vanes. The opening *o* is closed by a cap, *p*, when the indicator is not in use.

The apparatus is simple and practical and is not likely to get out of order, and the power consumed by it is inconsiderable.

Having thus described my invention, what I claim is—

1. The combination of a main engine or shaft with an indicating apparatus consisting

of a motor, C, pipe *d*, shell E, a fan, F, mounted therein, a worm, *l*, operated by said fan, a gear-wheel, H, with which the worm *l* meshes, and the shaft *m*, provided with a pointer, *e*,  
5 all substantially as set forth.

2. A pneumatic indicator consisting of a shell, E, a fan, F, mounted therein, a worm, *l*, operated by said fan, a gear-wheel, H, with which the worm meshes, and a shaft, *m*, pro-

vided with a pointer, *e*, all constructed and 10 arranged for operation as and for the purpose specified.

In testimony whereof I hereby affix my signature in presence of two witnesses.

GEORGE W. BAIRD.

Witnesses:

ALBERT N. PAGE,  
CHANNING RUST.