

(No Model.)

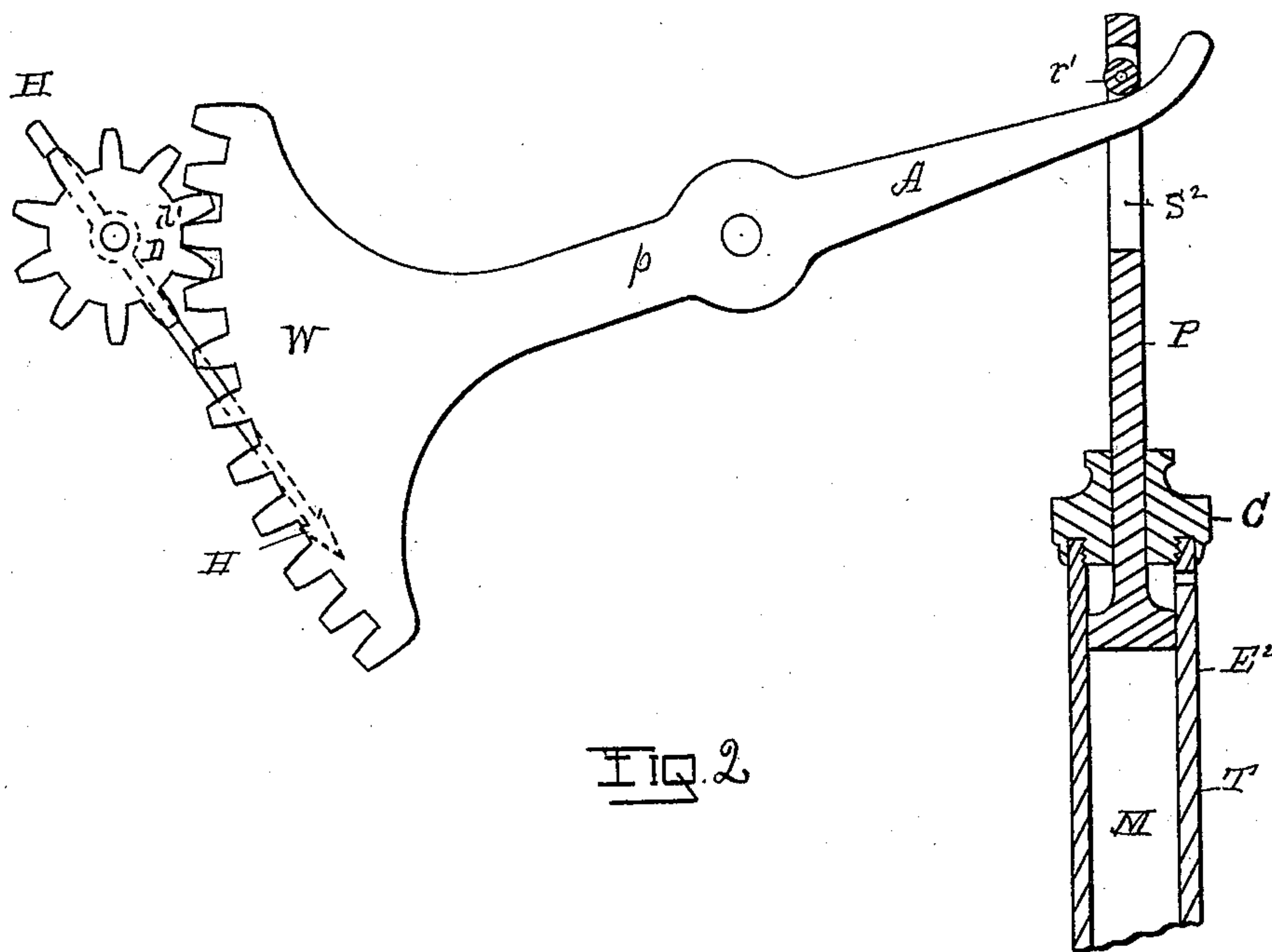
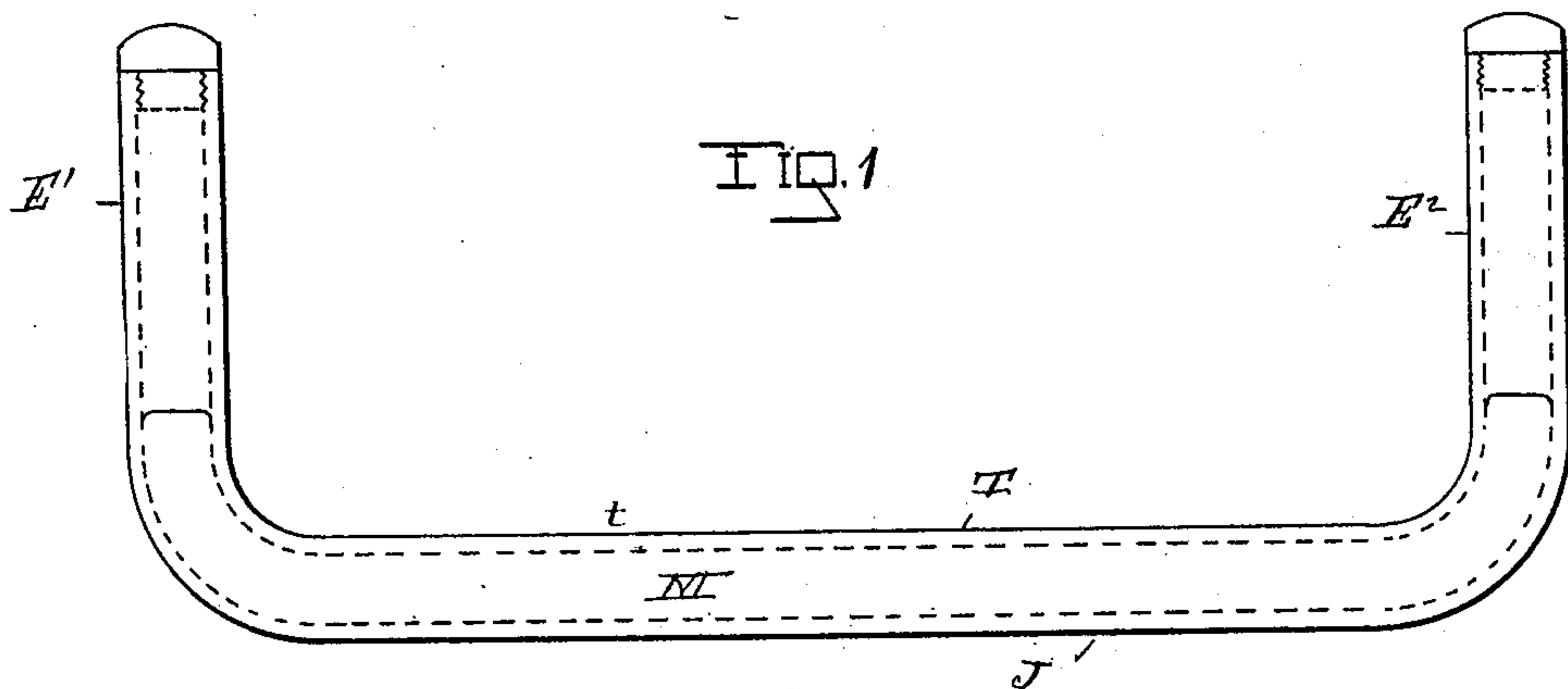
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W. H. ARNOLD.

DEVICE FOR INDICATING THE MEASURE OF RETARDATION APPLIED TO
ARREST THE MOMENTUM OF A TRAIN.

No. 404,947.

Patented June 11, 1889.



WITNESSES

William A. Sweet

Charles S. Brintnall

INVENTOR

William H. Arnold

by W. C. Hagan

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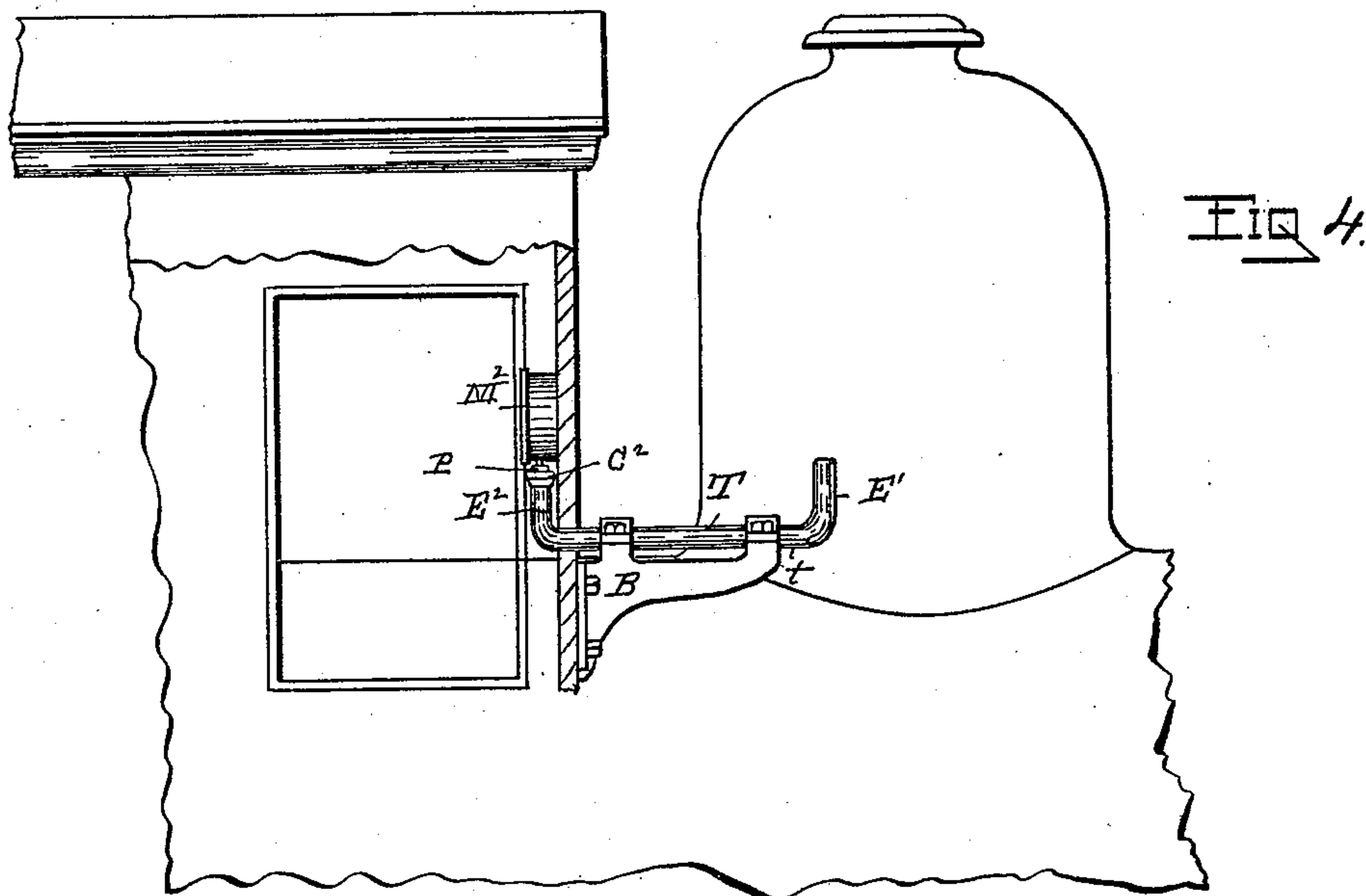
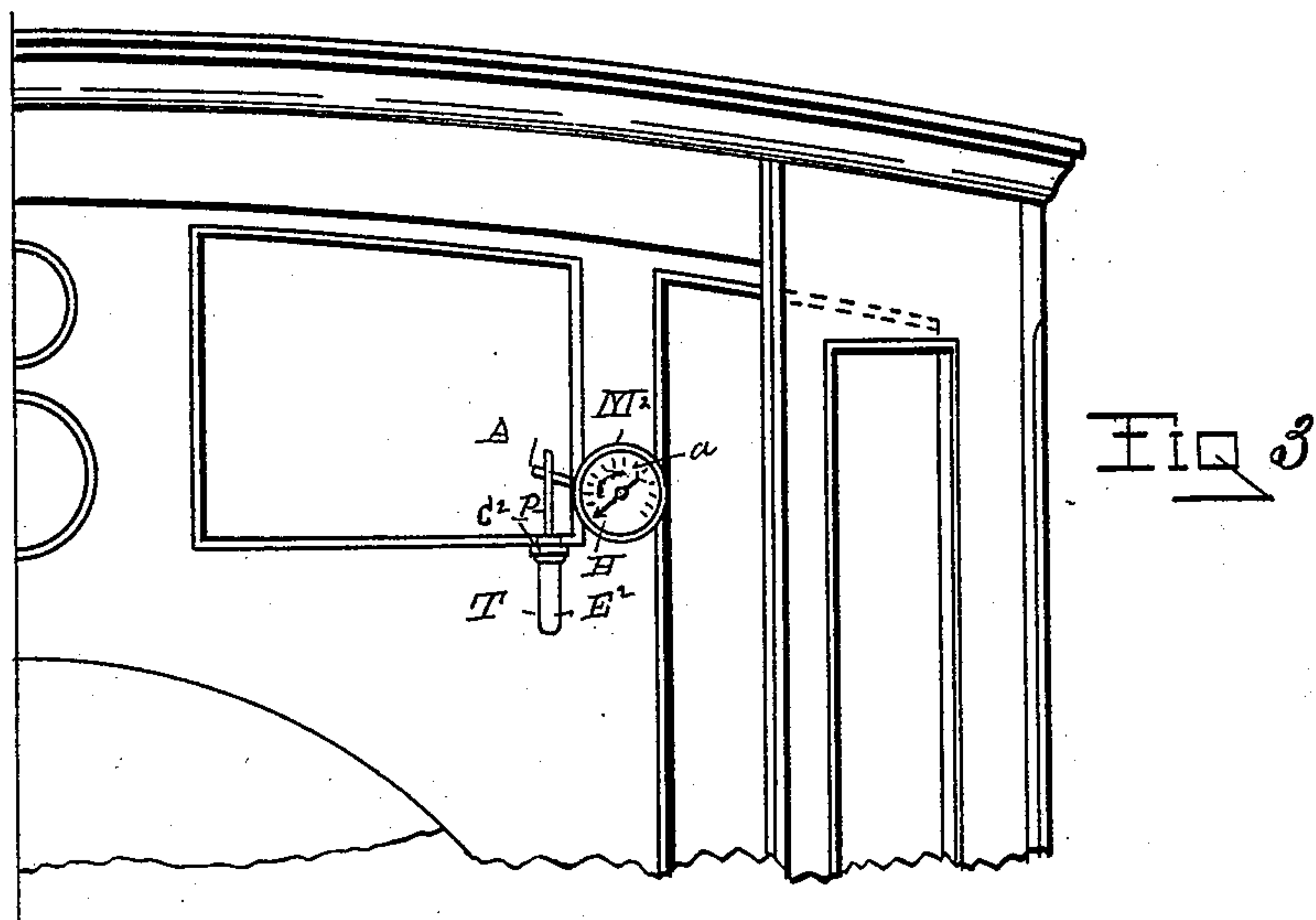
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UNITED STATES PATENT OFFICE.

WILLIAM H. ARNOLD, OF TROY, NEW YORK.

DEVICE FOR INDICATING THE MEASURE OF RETARDATION APPLIED TO ARREST THE MOMENTUM OF A TRAIN.

SPECIFICATION forming part of Letters Patent No. 404,947, dated June 11, 1889.

Application filed January 18, 1889. Serial No. 296,702. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. ARNOLD, of the city of Troy, county of Rensselaer, and State of New York, have invented a new and useful Device for Indicating the Measure of Retardation Applied to Arrest the Momentum of a Moving Train of Cars, of which the following is a specification.

My invention relates to an apparatus for indicating within the cab of a locomotive the relative measure of resistance exerted by the air-brakes to arrest the momentum of the train, so that the person operating said brakes may be enabled to regulate the steam or air pressure applied to the brakes to prevent a too-rapid stoppage of the train and the discomfort it causes the passengers.

My invention consists, as will be more fully detailed hereinafter in connection with its illustration, of a tube that is arranged horizontally within the cab of a locomotive or car to be parallel with the direction in which the train is to move, said tube having turned-up ends and containing mercury, which as the train is moving will receive and store up from the movement of the latter momentum, and as the speed of the train is checked said momentum or inertia will cause the mercury to rise up in that end of the tube which is in advance and operate a piston and connected pivoted segment to move an indicating-pointer.

Accompanying this specification to form a part of it there are two plates of drawings, containing four figures, illustrating my invention, with the same designation of parts by letter-reference used in all of them.

Of the illustrations, Figure 1 shows a side elevation of the tube having turned-up ends, in which the mercury is placed, with the attaching-bracket, the pistons, the segment-dial, and pointer being omitted. Fig. 2 is a section of the rear end of the tube and the piston, showing the sector and pinion in side elevation. Fig. 3 shows an interior end view of my invention as applied to a locomotive-cab, and Fig. 4 shows a side view of the same.

The several parts of the mechanism thus illustrated are designated by letter-reference,

and the function of the parts is described as follows:

The letter T designates a tube made of metal or other suitable material, having the horizontal body part *t* and the turned-up ends *E'* *E*², which tube is arranged with one of its turned-up ends within the locomotive-cab, so that its horizontal body part between the turned-up ends thereof shall be parallel to the direction in which the locomotive must move, with said tube supported on the bracket B, projected from the front end of the cab.

The letter M designates mercury placed within the tube.

The letter P designates a piston, which is arranged within the turned-up end *E'* of the tube T that is within the cab. This piston P, at its lower end, rests on the mercury within the tube, and from thence extends upwardly through a guide-cap C on the upper end of the tube. This piston, at its upper end, is made with a longitudinally-placed slot *S*², at the top of which there is arranged a friction-roller *r'*.

The letter W designates a geared sector arranged at right angles to said tube, and which sector has a pivot *p*, on which it can be turned, and it is back of where thus pivoted constructed with a lever-arm A, that enters the slot *S*² of the piston to rest against the under surface of the friction-roller *r'* arranged therein.

The letter D designates a pinion having a shaft *d'*, that has a bearing in the dial-plate *M*². This pinion D meshes into the sector W, so as to receive rotation therefrom, and has a hand or pointer H attached thereto, so as to move therewith.

As thus constructed and arranged, when the mercury in the tube T is caused to rise in the turned-up end *E'*, the piston P is also caused to fall and operate the sector W to operate the pinion D and turn the pointer H in the direction indicated by the arrow *a*.

The dial is laid off in spaces radially, and by noting the movement of the pointer the person operating the air-brakes can tell how rapidly they are reducing the speed of the train.

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

5 In a device for indicating the measure of retardation applied to arrest the momentum of a moving train of cars, the combination, with a tube horizontally placed upon a locomotive and arranged parallel to the direction in which the latter must move, said tube hav-
10 ing turned-up ends and containing mercury, of a piston arranged in one of the turned-up

ends of said tube, a pivoted and geared sector making a connection with said piston by means of a lever-arm, a pinion provided with a pointer and meshing into said sector, and a 15 dial-plate back of said pointer, substantially as and for the purposes set forth.

WILLIAM H. ARNOLD.

Witnesses:

CHARLES S. BRINTNALL,
W. E. HAGAN.