

(No Model.)

R. H. INNES.
DYNAMOMETER FOR LOCOMOTIVES.

No. 444,611.

Patented Jan. 13, 1891.

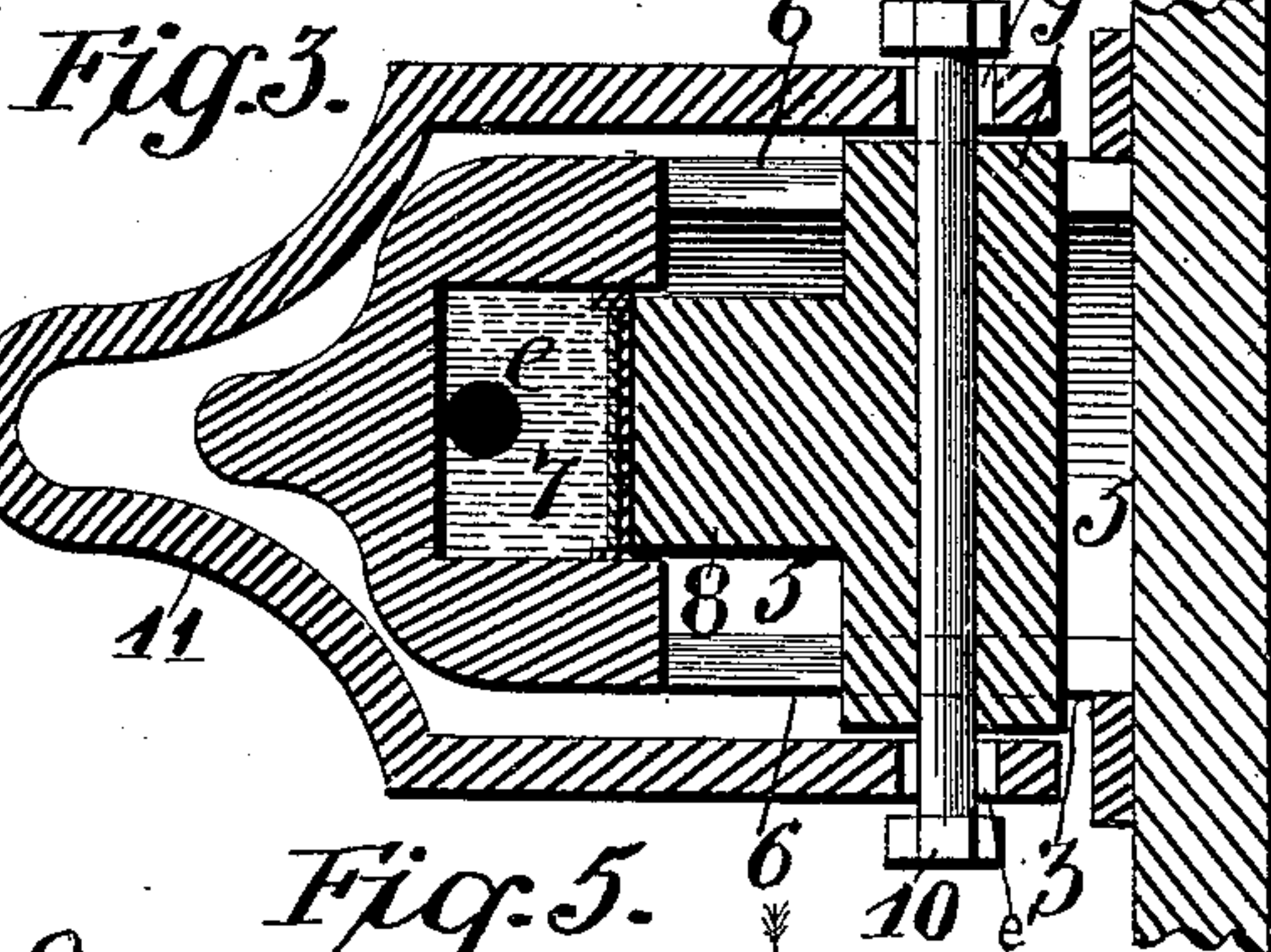
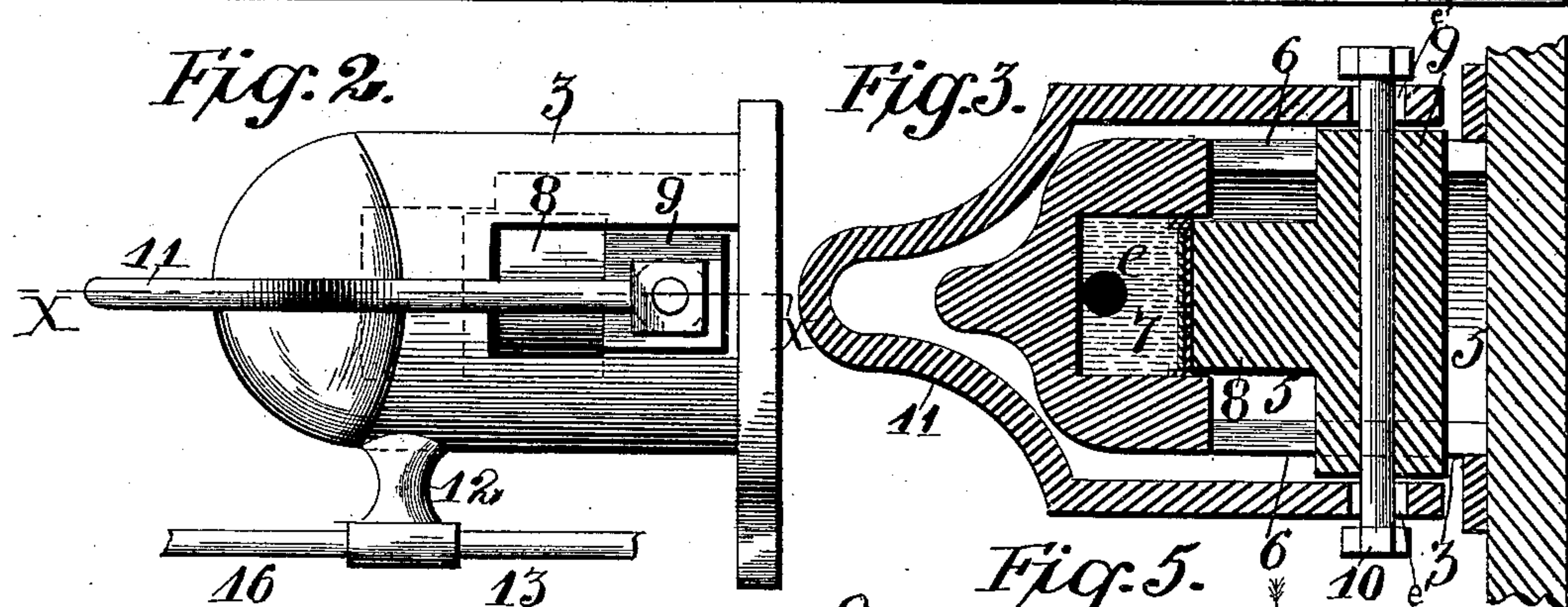
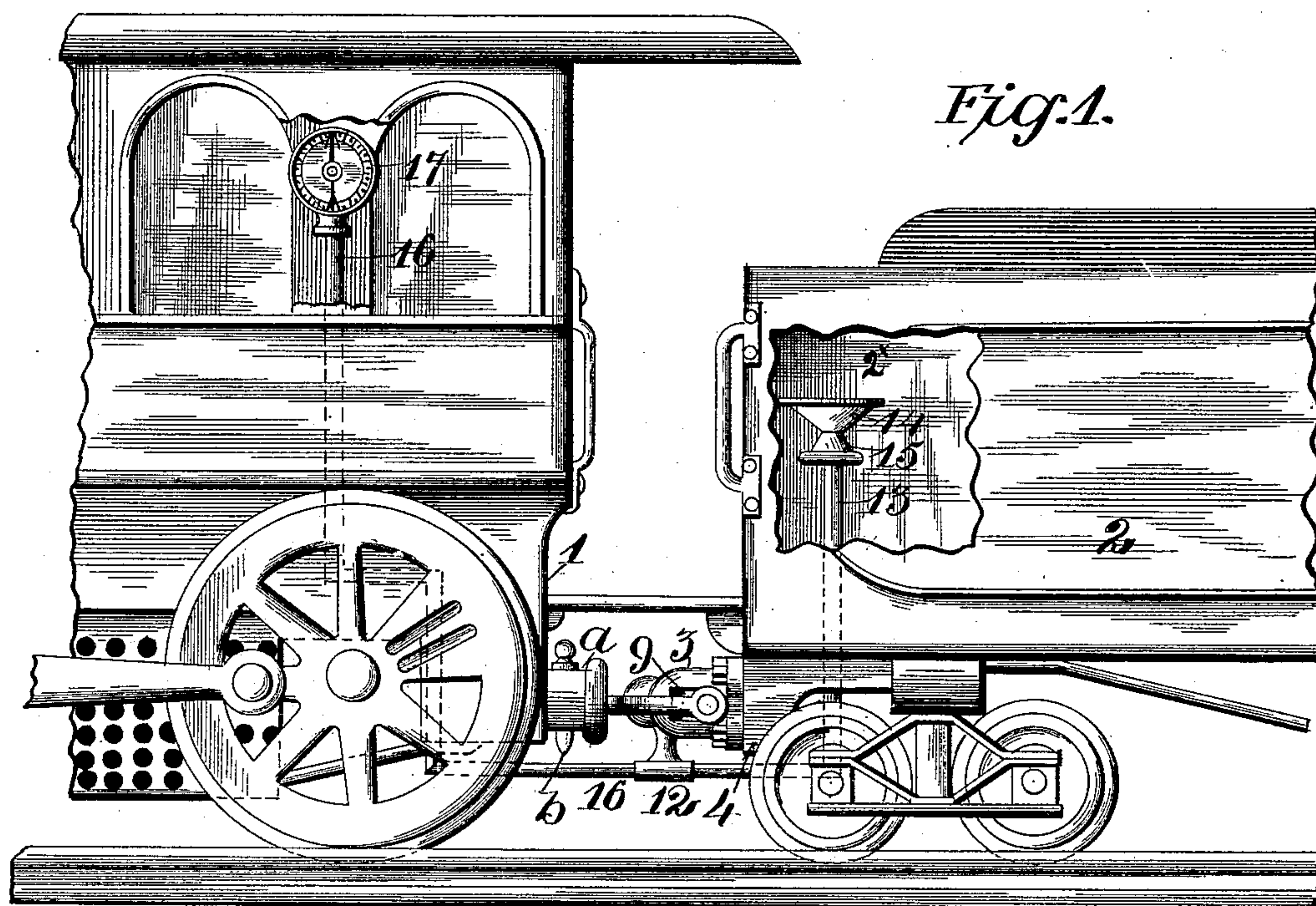


Fig. 4.

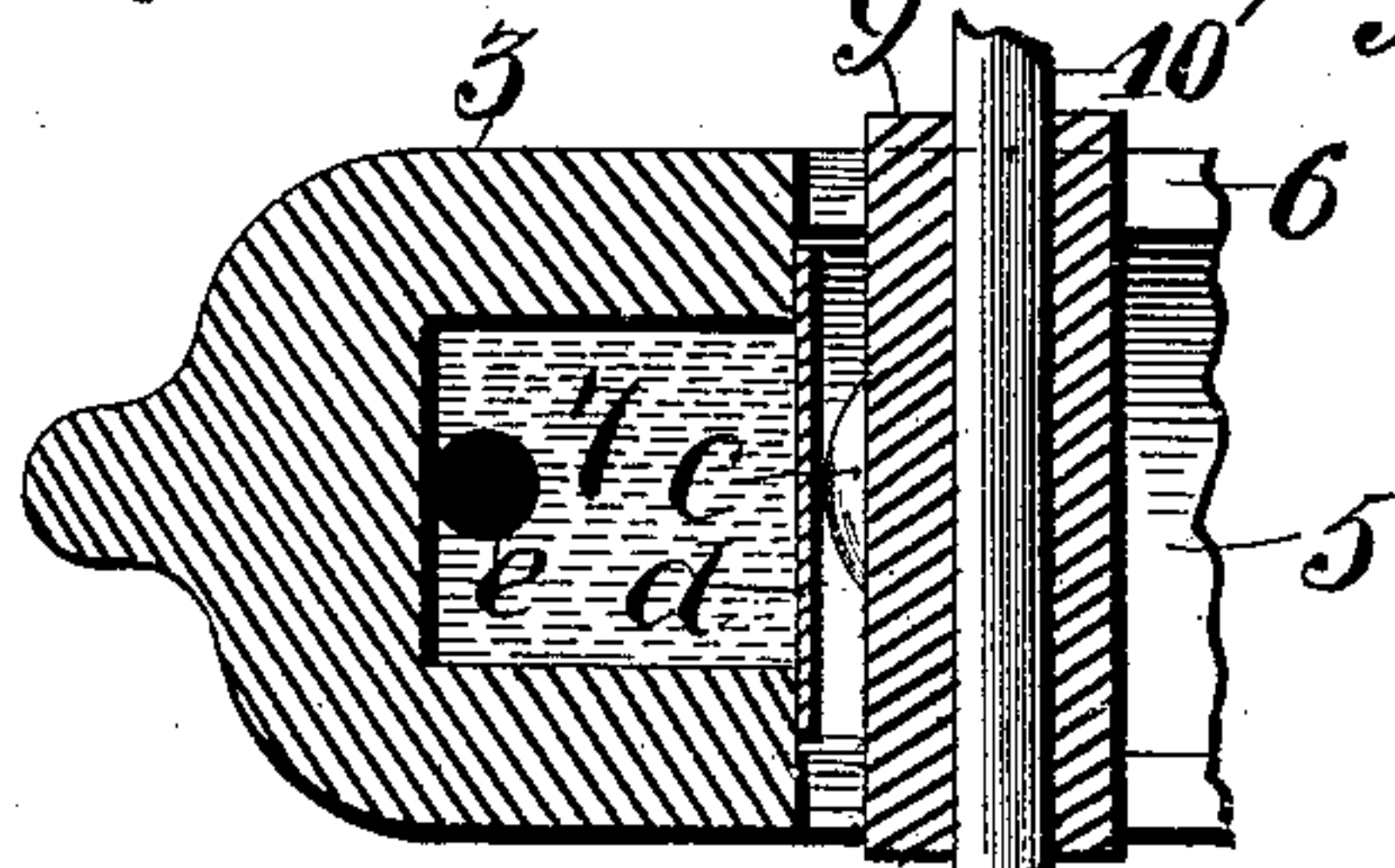
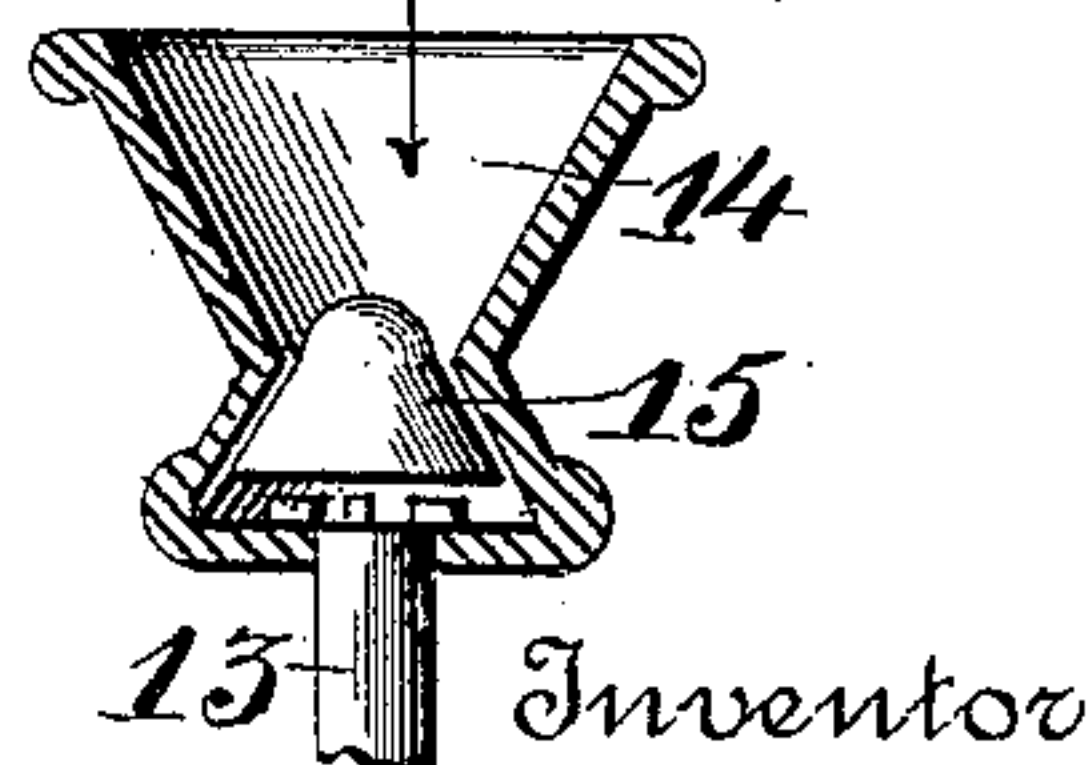


Fig. 5.



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DYNAMOMETER FOR LOCOMOTIVES.

SPECIFICATION forming part of Letters Patent No. 444,611, dated January 13, 1891.

Application filed May 26, 1890. Serial No. 353,196. (No model.)

To all whom it may concern:

Be it known that I, ROBERT H. INNES, of El Paso, El Paso county, in the State of Texas, have invented a new and useful Improvement in Dynamometers for Locomotive-Engines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has for its object to provide a novel construction in dynamometers for indicating the traction power of locomotives; and it consists in the novel combination and arrangement of parts, all of which will be hereinafter fully described, and pointed out in the claims.

In the drawings, Figure 1 is a side elevation of my complete invention as applied between the locomotive and tender. Fig. 2 is a side elevation of my invention detached. Fig. 3 is a longitudinal section, taken on the line $x x$ of Fig. 2. Fig. 4 is a longitudinal section of a modification of my invention; and Fig. 5 is a vertical section of the check-valve and its connections.

Referring to the drawings, 1 represents the locomotive, and 2 the tender, to which my invention is applied to more fully show its application to the same and arrangements of parts.

3 represents a draw-bar, which is of cylindrical form and suitably cored to receive the working parts of my invention. The draw-bar 3 is attached permanently to the dead-blocks 4 of the tender 2 by means of bolts or other suitable fastening devices.

5 represents the inner cylindrical portion of the draw-bar 3, and which has two slots 6 formed in that portion of the said draw-bar and immediately opposite one another, within which the guide or sliding bar 9 moves.

7 represents a cylinder or box containing a suitable liquid and which is formed integral with the cavity 5.

8 represents the piston or plunger, which is formed integral with the guide-block 9 and is operated thereby, which piston presses against the liquid contained in the box or receptacle 7 when draft is applied.

11 represents a stirrup, suitably shaped to conform with the shape of the draw-bar 3, the free ends of which are provided with holes e' ,

through which a bolt 10 passes, carried by the guide-block 9.

To the locomotive 1 is attached any well-known coupling device, and for the purpose of illustration I have shown a common draw-bar a , within which the linked portion of the stirrup 11 is inserted and connected thereto by means of a pin b , forming a perfect coupling between the locomotive and tender.

To the under side of the draw-bar 3 is screwed or otherwise attached a T-pipe 12, communicating with the opening e in the receptacle 7 containing the liquid.

13 represents a pipe or tube leading in any desired direction under the tender 2 to the water-tank 2^x thereof and projecting through a suitable opening in the floor of the same and secured in an upright position.

14 represents a funnel, suitably shaped at the bottom to receive a check-valve 15, which valve may be made of any suitable material without departing from the nature of my invention. One end of the pipe or tube 13 is connected to the T 12 and the opposite end thereof connected to the receiver or funnel 14, connecting the said funnel with the box or cylinder 7 containing the liquid.

16 represents a flexible tube leading from and connected to the T-pipe 12, the opposite end of which tube is carried up and located in any desired or conspicuous position in the cab of the locomotive. A pressure-indicator 17 is attached to the projecting end of the flexible tube 16, by which means the traction power of the locomotive is ascertained by the engineer.

In the modification illustrated in Fig. 4 I have shown a diaphragm d of flexible material covering the mouth of the box or receptacle 7 containing the liquid, which diaphragm, when pressure is applied, causes the liquid to assume the same position and to be acted upon in the same manner as in the device previously described. A button or other like projection c is secured to the guide-bar 9, which button presses against the diaphragm when traction is applied to the stirrup 11.

Operation: The liquid is supplied to the box or receptacle 7 by the pipe 13 through the medium of the funnel 14, the valve located in the said funnel allowing the water to pass in

that direction. By means of the pipe 13 the box or receptacle 7 is filled with liquid when desired, which becomes necessary for the complete operation of the device; or, by keeping the water at the proper height in the tender-tank it is apparent that the receptacle 7 will always be filled with water. When draft is applied to the stirrup 11, the liquid contained in the box 7 will be correspondingly pressed, causing the said liquid to assume a greater or less pressure, as will be indicated by the gage, according to the traction power of the locomotive. The check-valve 15 prevents the liquid from passing out of the pipe 13 when draft is applied, but allows the liquid to pass in the opposite direction, as previously described.

In carrying out my invention it will be readily seen that the engineer is at all times informed of the traction power of the locomotive, thereby presenting to him the knowledge not heretofore known by engineers, and which will enable him to run the locomotive with better satisfaction and with better results.

The invention can be successfully applied to tow-boats in a like manner and with the same results.

Having fully described my invention, what I claim is—

1. In a device for indicating the traction power of locomotives, a draw-head, a chamber containing a liquid located therein, a piston operating in said chamber, means for connecting said piston with the opposite draw-head, suitable tubing connecting with the said chamber, and a pressure-gage mounted upon or attached to the said tubing and actuated by the said liquid, substantially as described.

2. In a device for indicating the traction power of locomotives, a draw-head, a chamber located therein adapted to contain a liquid,

a piston or the like working in the draw-head and bearing against the liquid in said chamber, means for connecting said piston with the opposite draw-head, and means whereby the pressure on said liquid may be registered, substantially as described.

3. In a device for measuring the traction power of locomotives, the combination, with a draw-head, of a chamber located therein adapted to receive a liquid, slots in the sides of the chamber, forming guides, a piston or the like having a cross-head working in the guides and operated by the pressure of the liquid in the chamber, and means for connecting said piston with the opposite draw-head, in combination with means for determining the pressure on said liquid, substantially as described.

4. In a device for indicating the traction power of locomotives, the combination, with a draw-head, a chamber located therein adapted to receive a liquid, slots in the sides of the draw-head, forming guides, a piston bearing against the liquid in the chamber and having a cross-head working in said guides, and a stirrup 11, secured to the cross-head for engagement with the opposite draw-head, of a water-supply pipe leading from said chamber and connected with a suitable tank or the like, a valve located in said pipe adapted to admit water to the chamber but prevent its discharge therefrom, and means for indicating the pressure of the liquid within the chamber, substantially as described.

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

ROBERT H. INNES.

Witnesses:

H. G. MOORE,
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