

N° 26,309



A. D. 1903

*Date of Application, 2nd Dec., 1903*

*Complete Specification Left, 2nd Sept., 1904—Accepted, 10th Nov., 1904*

**PROVISIONAL SPECIFICATION.**

**Improvements in Apparatus for Raising Steam in Locomotive and other Boilers.**

I, GEORGE HUGHES of Overdale, Victoria Road, Horwich, County of Lancaster, Mechanical Engineer, do hereby declare the nature of this invention to be as follows:—

This invention relates to apparatus for producing a draught through the fire box and tubes of locomotive boilers (or other steam generators) during the initial stages of firing for the purpose of raising steam therein either while the locomotive engine is in the engine shed, or during the testing of the boiler and tubes before the smoke box is fitted thereto.

As applied to a locomotive shed, or other structure an air shaft or conduit is placed to extend along the ordinary smoke shoot with openings or apertures therein at intervals. Each aperture is fitted with a down piece or tube to connect with the chimney of the locomotive. The down piece is constructed with a fixed tube attached to the air shaft and a second tube telescoping into the fixed one so that it may be drawn down to any extent to engage with the top of the chimney. The movable tube is supported by or hung upon chains passing over pulleys and counterweighted at the other end with suitable weights or springs. A valve or shutter is formed at the lower end of the telescopic tube which will close and remain closed when not in engagement with the chimney this shutter or valve may be made in any convenient manner. At present I prefer to make the lower end of the tube enlarged with an annular plate or flange enclosing part of the end. Over the aperture so formed a disc is placed which rests upon the flange to close it and below it is a ring connected by studs or pins to rest upon the chimney. When drawn down onto the chimney top the ring pushes the inner disc upwards allowing of a passage round it for air and products of combustion. One two or more catches are affixed to the outside of the telescopic tube to engage the flange of the chimney top to hold the down piece in contact with the chimney during the time required. At one end of or in any convenient position upon the air duct or conduit a fan or air propeller is fitted to induce a draught through it and a chimney or funnel to discharge the products of combustion. The fan or air propeller may be of any known make or construction and is preferably driven by an electric motor or it may be driven by a strap or otherwise from any source of power. It is to be understood that the down piece from the air duct may be made of any other convenient construction to be raised and lowered to and from the chimney top so as to engage with it and induce a current through the fire box and tubes of the boiler.

As applied to boilers under test before being fitted with a smoke box and chimney the apparatus is constructed with a casing of truncated cone or other tubular shape to fit against the end of the boiler over the ends of the tubes. Behind the tubular casing is fitted the fan or air propeller driven by an electric or other motor direct or from other source of power. From the casing behind the fan a chimney extends upwards to carry off the products of combustion. The apparatus is supported upon or carried by a framing slung from a cross head or bar at the end of a jib or from a travelling gantry or crane or otherwise so

[Price 8d.]



**Improvements in Apparatus for Raising Steam in Locomotive and other Boilers.**

that it may be readily applied and removed as required. A clip or catch is provided to hold it in position during operation.

By this apparatus a very considerable acceleration can be effected in raising steam in locomotive boilers.

Dated this 1st day of December, 1903.

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J. OWDEN O'BRIEN,  
Successor to and late of W. P. Thompson & Co.,  
Of Manchester, Patent Agents.

**COMPLETE SPECIFICATION.****Improvements in Apparatus for Raising Steam in Locomotive and other Boilers.** 10

I, GEORGE HUGHES, of Regent House, Lostock Park, Bolton, County of Lancaster, late of Overdale, Victoria Road, Horwich, County of Lancaster, Mechanical Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained 15 in and by the following statement:

This invention relates to apparatus for producing a draught through the fire box and tubes of locomotive boilers (or other steam generators) during the initial stages of firing for the purpose of raising steam therein either while the locomotive engine is in the engine shed, or during the testing of the boiler and tubes 20 before the smoke box is fitted thereto.

The invention will be fully described with reference to the accompanying drawings:—

Fig. 1. Longitudinal section of locomotive shed showing the apparatus as arranged for drawing up the fires for locomotive engines therein with engine in 25 position.

Fig. 2. Plan of Fig. 1.

Fig. 3. Transverse section enlarged showing details of apparatus for connecting with the locomotive chimney.

Fig. 4. Side elevation of same partly in section with the parts in position on 30 the locomotive chimney.

Fig. 5. Side elevation of apparatus for drawing up the fires of locomotive boilers for testing before the smoke box is fitted thereto.

Fig. 6. Sectional plan of same.

Fig. 7. End elevation of same.

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As applied to a locomotive shed or other structure in which locomotive or other portable engines are housed a smoke shaft or conduit A is placed to extend along the ordinary smoke trough with openings or apertures therein at intervals to accommodate the locomotive chimneys D. At each aperture a down piece or tube B is attached to the conduit with an adjustable sliding or extension tube 40 B<sup>1</sup> at its outer end to connect the chimney D with the interior of the conduit A. The adjustable tube B<sup>1</sup> is supported by or hung upon chains or wire ropes B<sup>2</sup> passing over the pulleys B<sup>3</sup> in brackets B<sup>4</sup> and counter-balanced at the other end with weights B<sup>5</sup> or springs *etc.* A valve or shutter C is formed at the lower end of the adjustable tube B<sup>1</sup> which will close and remain closed by gravity 45 when not engaged with the locomotive chimney D.

The lower end of the tube B<sup>1</sup> is preferably enlarged and provided with an annular plate or internal flange E, the opening *e* in the plate being equivalent

*Improvements in Apparatus for Raising Steam in Locomotive and other Boilers.*

to the area of the tube, which forms a seating for the valve. The valve comprises a disc or shutter C and annular plate or ring F connected by studs or pins *f*. The disc or shutter C rests upon the annular flange E and closes the opening *e* therein and when the tube B<sup>1</sup> is drawn down the ring F rests upon the top of the locomotive chimney D and pushes the valve or shutter C upwards forming a passage round it for air and products of combustion to enter the tube B and pass to the smoke conduit A.

To the outside of the adjustable tube B<sup>1</sup> one two or more catches G are pivoted to engage the top of the chimney D and hold it in contact therewith during the operation. The catches G are pivoted in the brackets H and held in engagement with the flange of the chimney top D by springs J.

At one end of the shed or in any convenient position upon the smoke shaft or conduit A a fan or air propeller K is fitted to induce a draught through the conduit A and a chimney or funnel L is provided to discharge the products of combustion.

The fan or air propeller K may be of any known make or construction and is preferably driven by an electric motor M or it may be driven by a strap or otherwise.

It is to be understood that the adjustable connections B<sup>1</sup> from the smoke shaft or conduit may be made of any other convenient constructions to be raised and lowered to and from the locomotive chimney top to engage with it so that a current of air may be induced through the fire box and tubes of the locomotive boiler.

Referring to Figs. 5, 6 and 7 the invention is shown as applied to boilers under test before being fitted with a smoke box and chimney. The apparatus is constructed with a conical smoke box P to be attached to the end of the boiler, carrying a fan K and motor M and provided with a vertical chimney to discharge the products of combustion the whole being suspended by connecting rods from the jib of a swing crane or otherwise so that it can be readily moved into position and removed as required. The fan K is placed on the armature shaft N of the motor M, the fan casing K<sup>1</sup> is attached to the conical smoke box P at O and the smoke box is held in position against the tube plate Q of the boiler, by catches or clips R. The casting or bracket S is fixed to the conical smoke box P at T and is arranged to carry the whole combination suspended from a swing crane U affixed to the wall of the building. On the fan casing is a small auxiliary chimney V to carry away the products of combustion and fixed to the principle of the roof is a chimney V<sup>1</sup> working into which is an adjustable chimney V<sup>2</sup> supported or hung upon chains or wire rope V<sup>3</sup> passing over the pulleys V<sup>4</sup> in brackets V<sup>5</sup> and counterbalanced at the other end with the weights or springs V<sup>6</sup> so that it can be moved up and down to suit the chimney V. When the apparatus is not required the chimney V<sup>2</sup> is drawn up and then the whole combination can be moved away.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. Apparatus for producing a draught through the fire box and tubes of locomotive boilers constructed with smoke conduit, having apertures at intervals therein provided with adjustable tubes or connections to engage the top of a locomotive chimney and valves to close the apertures when not in use substantially as described.

2. In apparatus for producing a draught through the fire box and tubes of locomotive boilers the combination of the smoke conduit running the length of the shed, a fan or air propeller placed therein (preferably at one end) to create a suction through it, apertures at intervals leading into the smoke conduits, adjustable tubes at such apertures to engage the tops of locomotive chimneys, and a valve to close the aperture when not in use substantially as described.

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3. Apparatus for producing a draught through the fire box and tubes of locomotive boilers when the fire box and chimney are absent constructed with a conical smoke box provided with clips to attach it temporarily to the tube plate, a fan and fan casing, a motor to drive the fan and an auxiliary chimney and means for suspending it from a jib or swivelling arm substantially as described. 5

4. Apparatus for producing a draught through the fire box and tubes of locomotive boilers constructed and arranged in combination substantially as described and shown in Figs. 1 to 4.

5. Apparatus for producing a draught through the fire box and tubes of locomotive boilers constructed and arranged in combination substantially as described and shown in Figs. 5, 6, and 7. 10

Dated this 25th day of August, 1904.

J. OWDEN O'BRIEN,  
Successor to and late of W. P. Thompson & Co.,  
Of Manchester. Patent Agents. 15

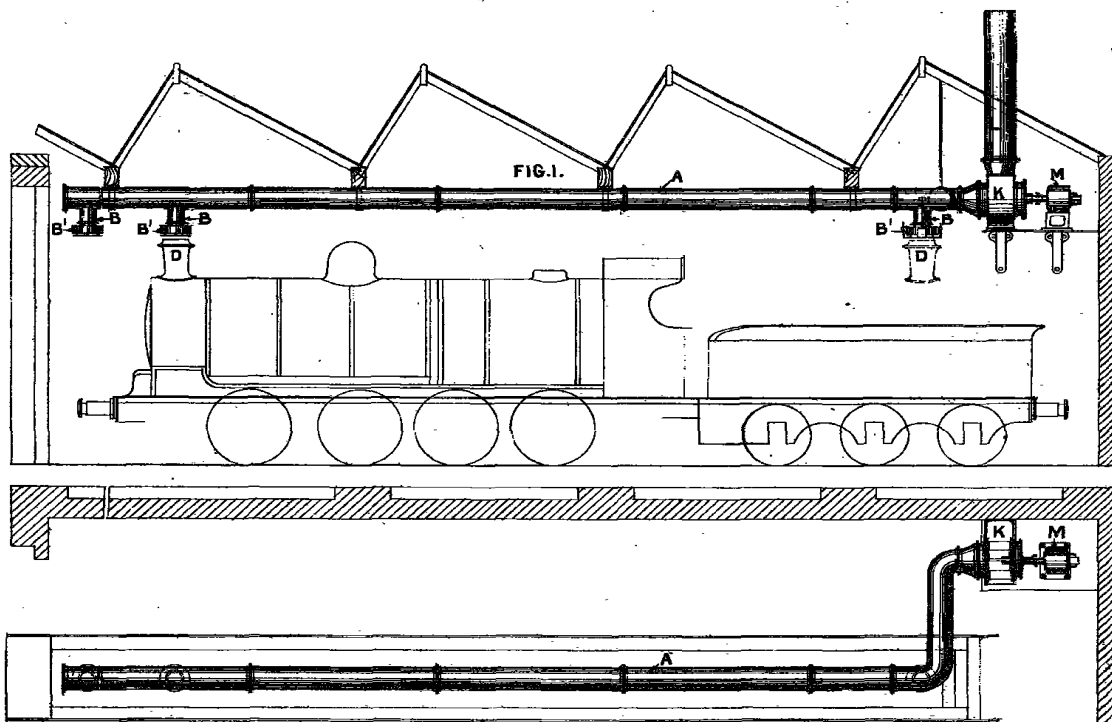
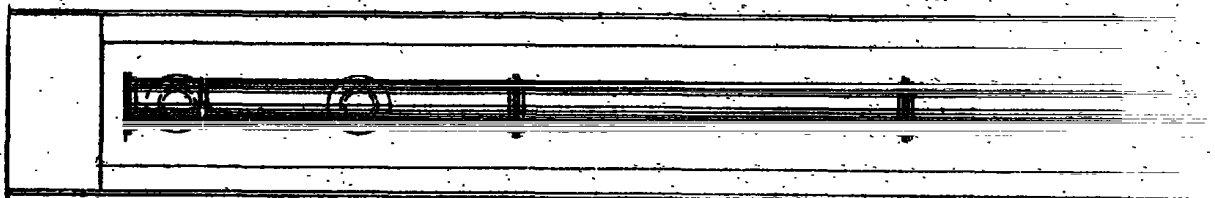
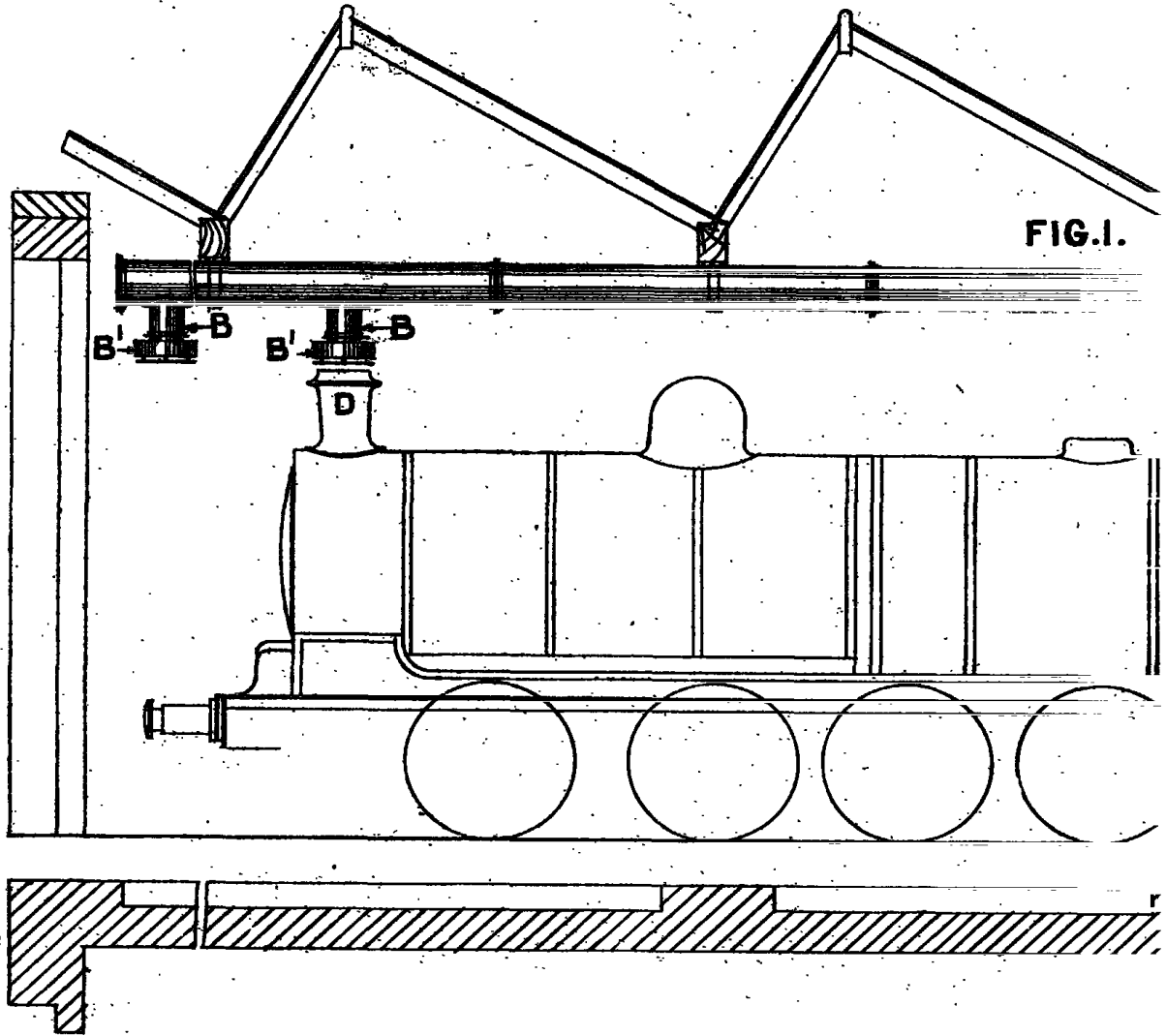
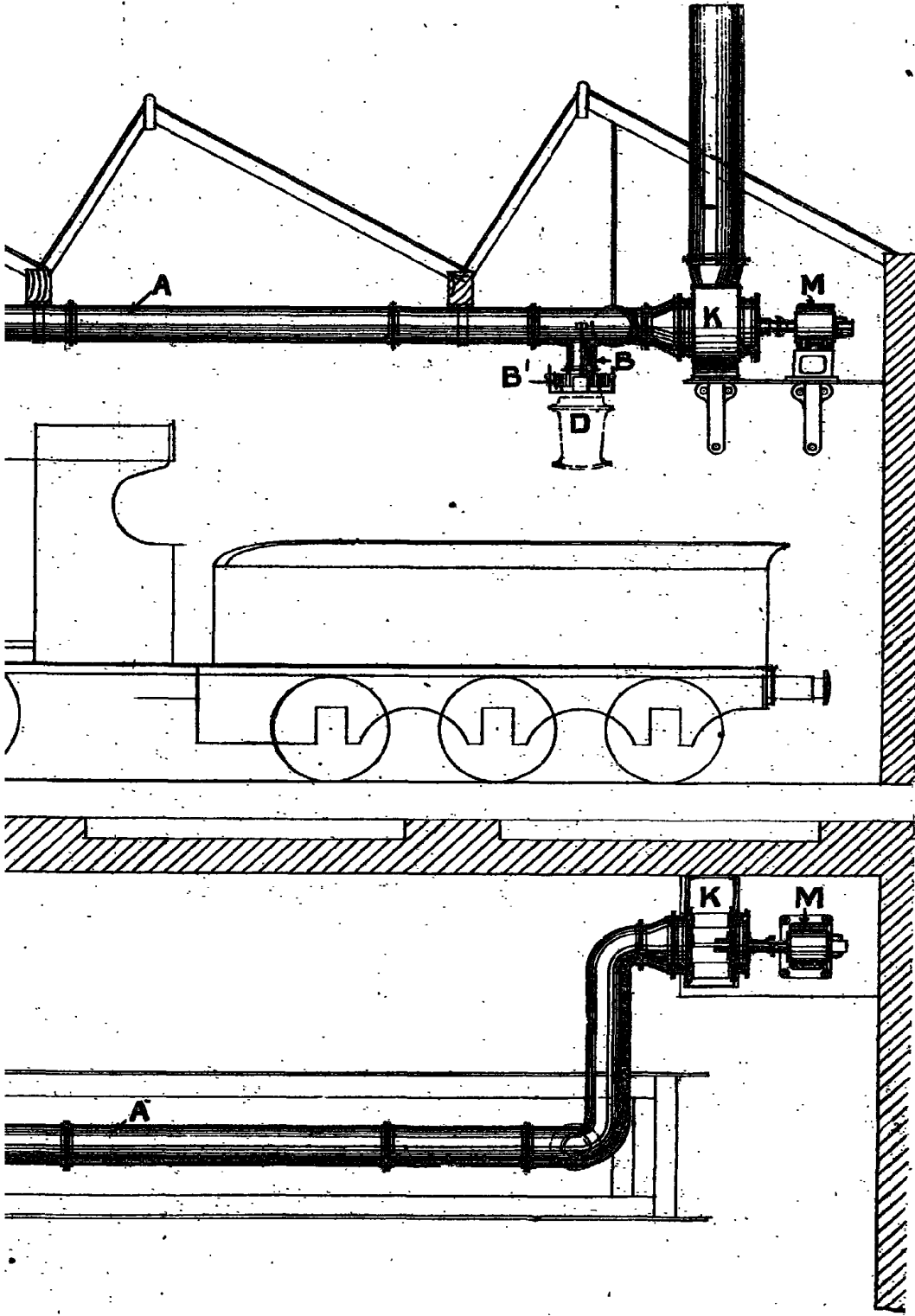


FIG. 2.

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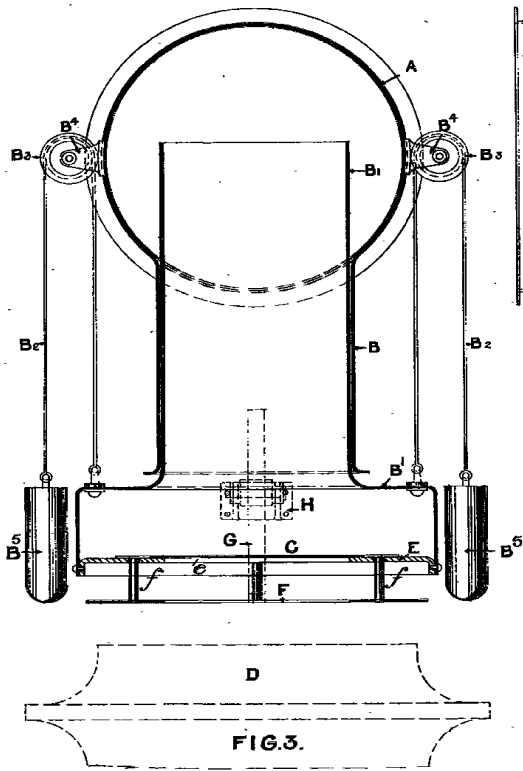


FIG. 3.

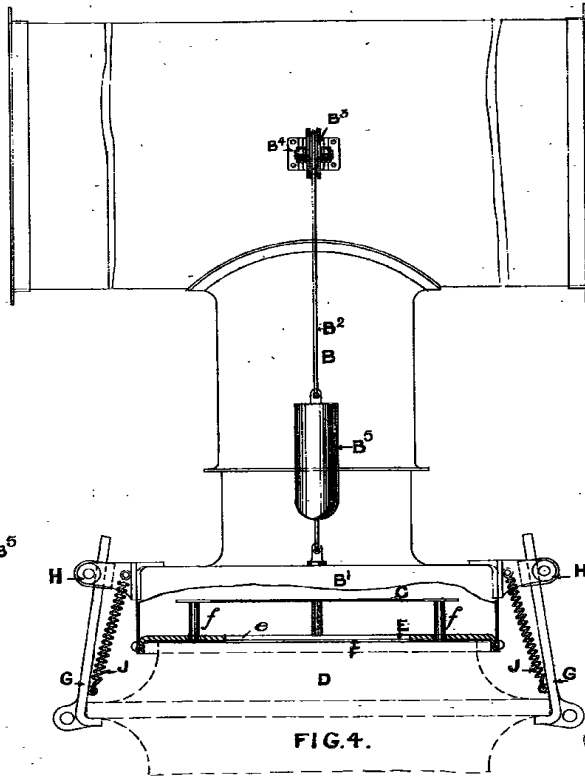


FIG. 4.

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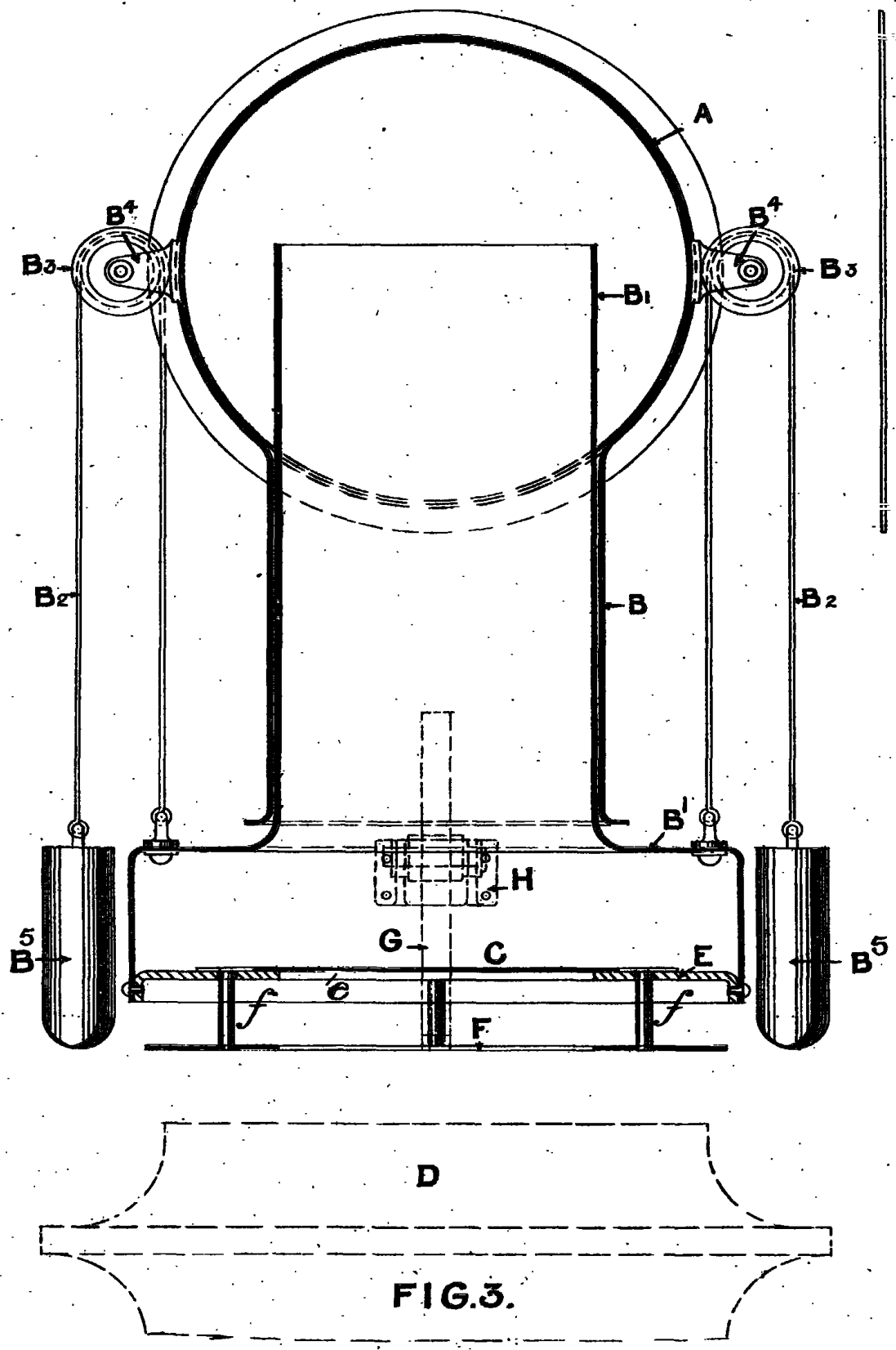


FIG.3.

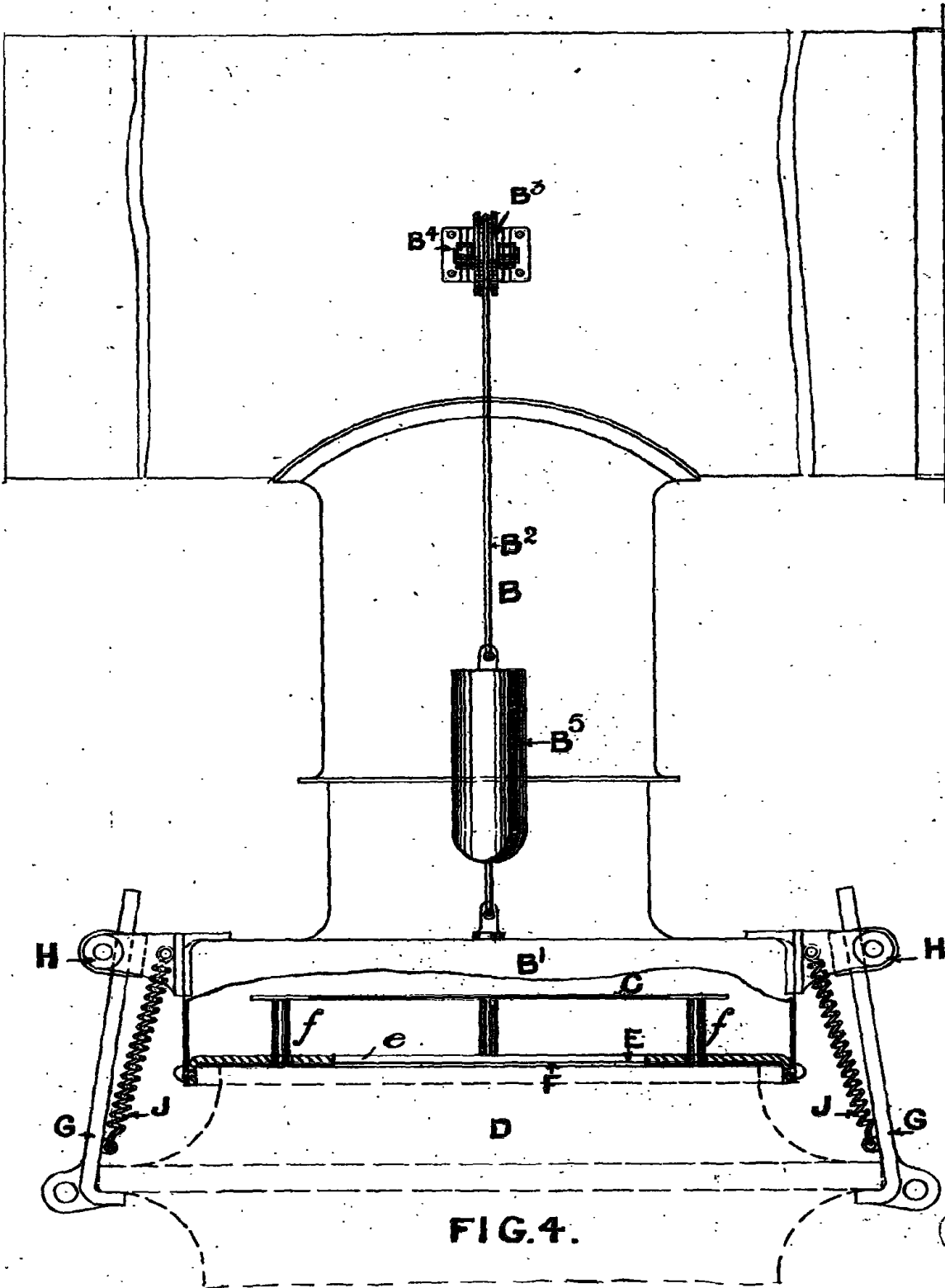
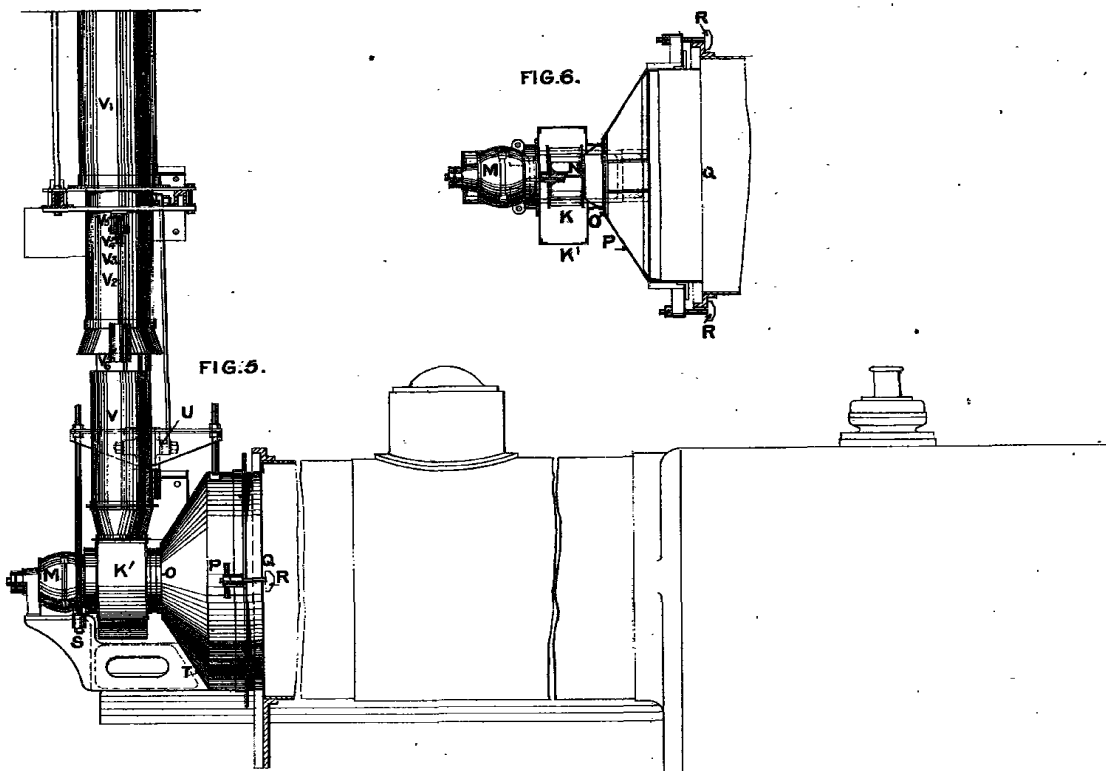


FIG. 4.

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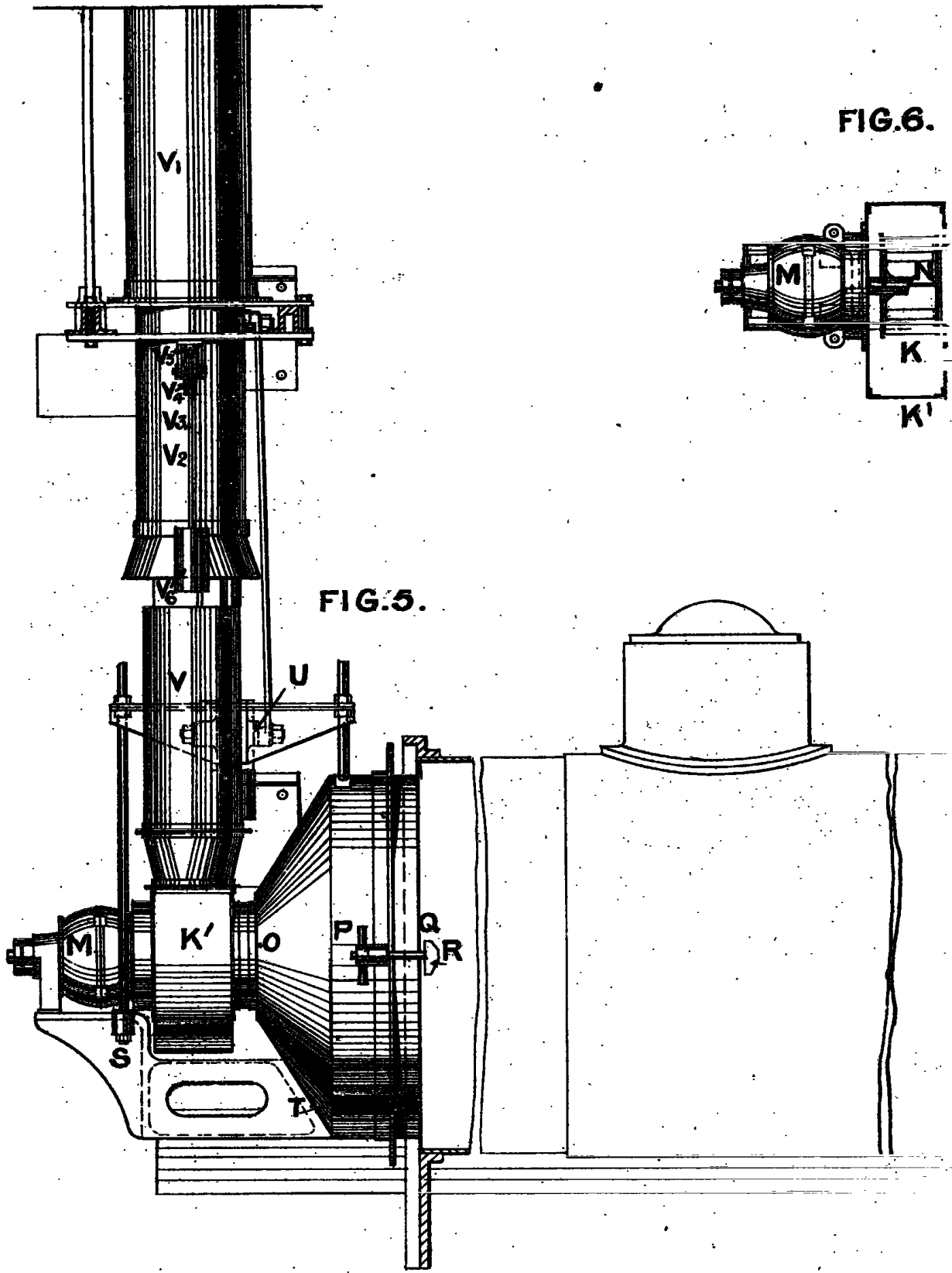
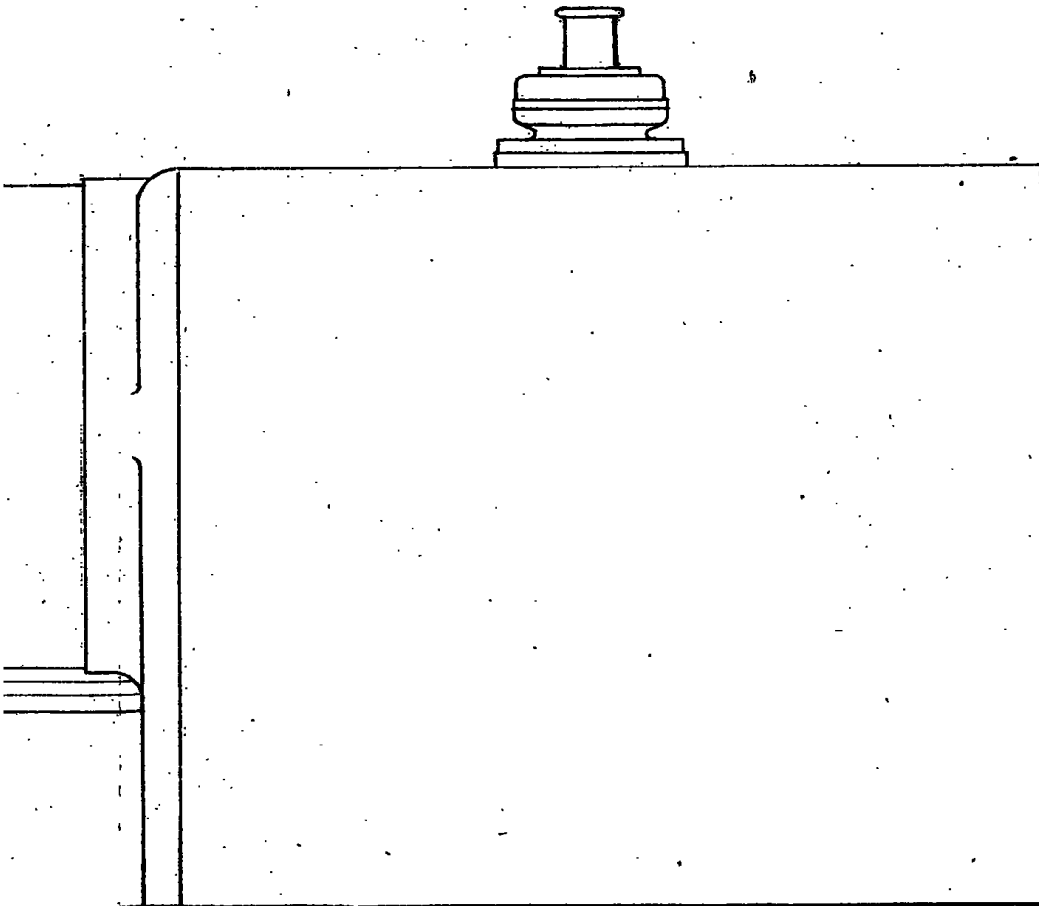
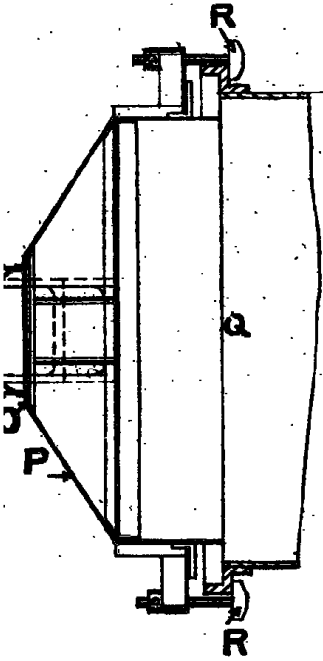


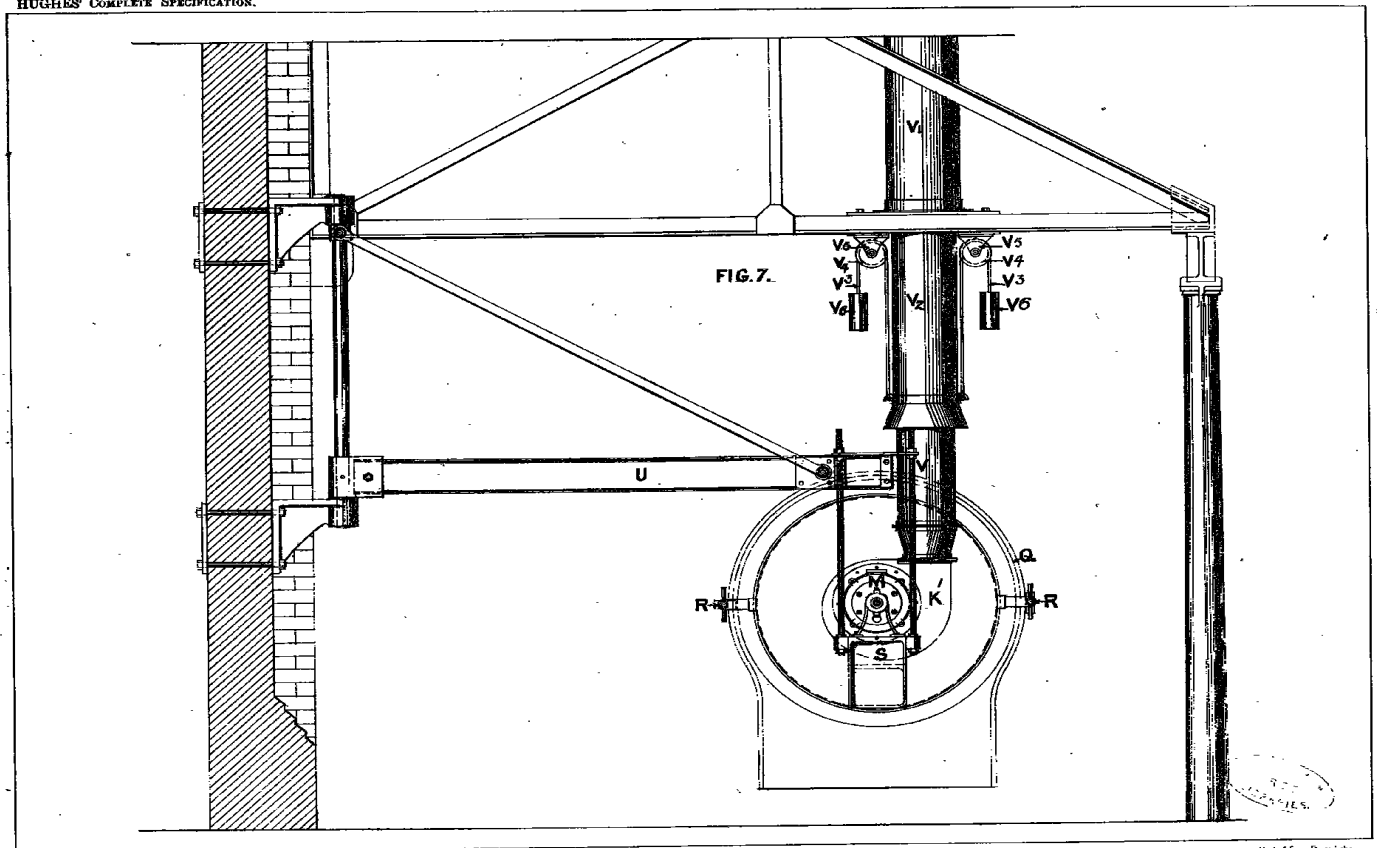
FIG. 6.

FIG. 5.



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HUGHES' COMPLETE SPECIFICATION.

