

N° 18,196



A.D. 1906

Date of Application, 14th Aug., 1906—Accepted, 31st Jan., 1907

COMPLETE SPECIFICATION.

Improvements in Condensers.

I, GEORGE HUGHES, of Regent House, Lostock Park, Bolton-le-Moors, 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 in and by the following statement:—

- 5 This invention relates to condensers applicable for locomotive or traction engines of the type in which the tubes are arranged in groups or sets to enable any group to be readily removed being designed more especially for locomotives with compound condensing engines such as described in the Specification of my former Patent No. 3729/1906.
- 10 The invention will be fully described with reference to the accompanying drawings forming part of the specification.
- Fig. 1. Longitudinal sectional elevation of the condenser.  
Fig. 2. Transverse section of condenser showing position of same on a locomotive engine relative to the boiler.
- 15 Fig. 3. Sectional plan.  
Fig. 4. Sectional elevation (enlarged), showing three sets or nests of condenser tubes.  
Fig. 5. Transverse section of same.  
Fig. 6. Sectional plan.
- 20 The apparatus is constructed with a steam chamber or series of steam chambers A and a steam chamber or series of steam chambers B which are respectively connected by tubes C. I prefer the construction of sets or series of chambers through which the steam flows alternately in a zig zag path though there may be a single chamber at each end of the tubes C and the steam flow
- 25 from one to the other.
- The chambers A are made with a series of cross bars  $a$  and division plates  $a^1$  with holes  $a^2$  therein to receive screws or studs  $a^3$  and the chambers B are made with similar cross bars  $b$  and division plates  $b^1$  with holes  $b^2$  to receive the studs or screws  $b^3$ .
- 30 The tubes C are affixed in groups or sets to plates D and  $D^1$  and these are secured in position between the cross bars and plates  $a$   $a^1$  and the cross bars and plates  $b$   $b^1$  by bars  $d$   $d^1$  secured by the studs or set screws  $a^3$  and  $b^3$ . A copper or other packing ring  $d^3$  is inserted to secure a steam tight joint. Instead of screws, studs with cotters may be employed.
- 35 Holes  $b^4$  may be provided in the division plates  $b^1$  for the drainage of condensed water through the chambers B.
- Each group or set of tubes C with the plates D  $D^1$  slide into position between the top and bottom chambers A and B. This construction of condenser tubes divided into groups gives a ready means for the removal and replacement of
- 40 any tube that should happen to leak.
- The tubes C through which the steam passes may be open to the atmosphere or they may be enclosed in a casing, or they may be placed in a tank or be otherwise arranged to condense the steam passing through them.

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

45 what I claim is:—

1. In a locomotive or traction engine a condenser for steam constructed with  
[Price 8d.]



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*Hughes's Improvements in Condensers.*

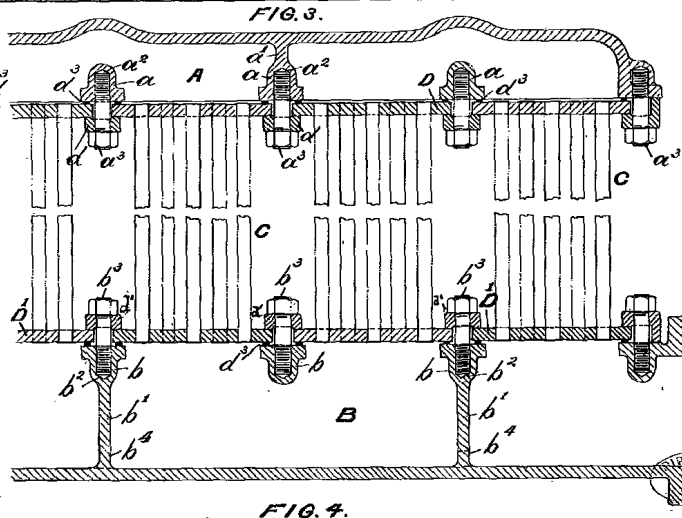
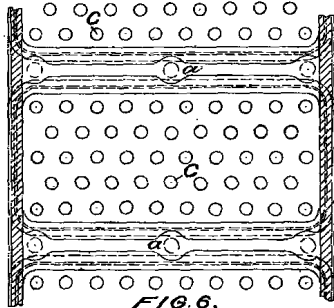
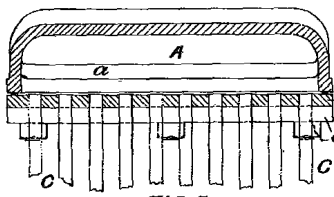
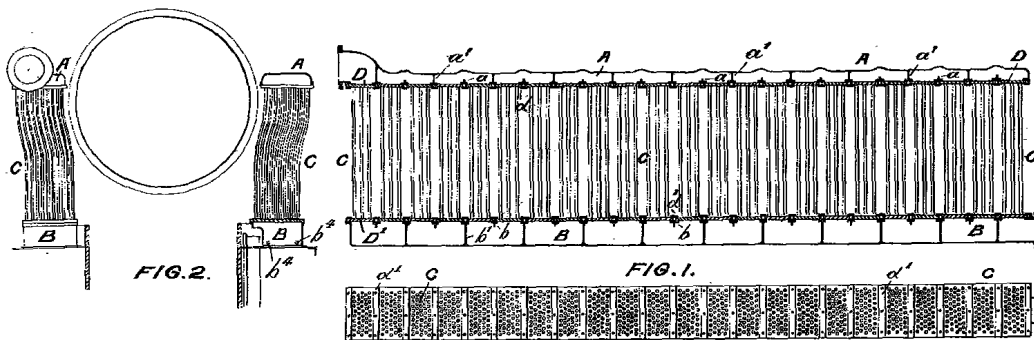
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steam chambers (such as A and B) transverse bars (such as *a* and *b*) in the said chambers to which the tube plates are secured, with or without the division plates *a*<sup>1</sup> and *b*<sup>1</sup> tubes connecting with the chambers and a number of plates D D<sup>1</sup> to which tubes are affixed in groups to render the tubes readily removable substantially as described.

2. A condenser having the several parts constructed and arranged in combination substantially as described and shown. 5

Dated this 13th day of August, 1906.

J. OWDEN O'BRIEN,  
Successor to and late of W. P. Thompson & Co. of Manchester. 10  
Patent Agents.



WINGHAM  
 FREE  
 PRESS

[This Drawing is a reproduction of the Original on a reduced scale.]

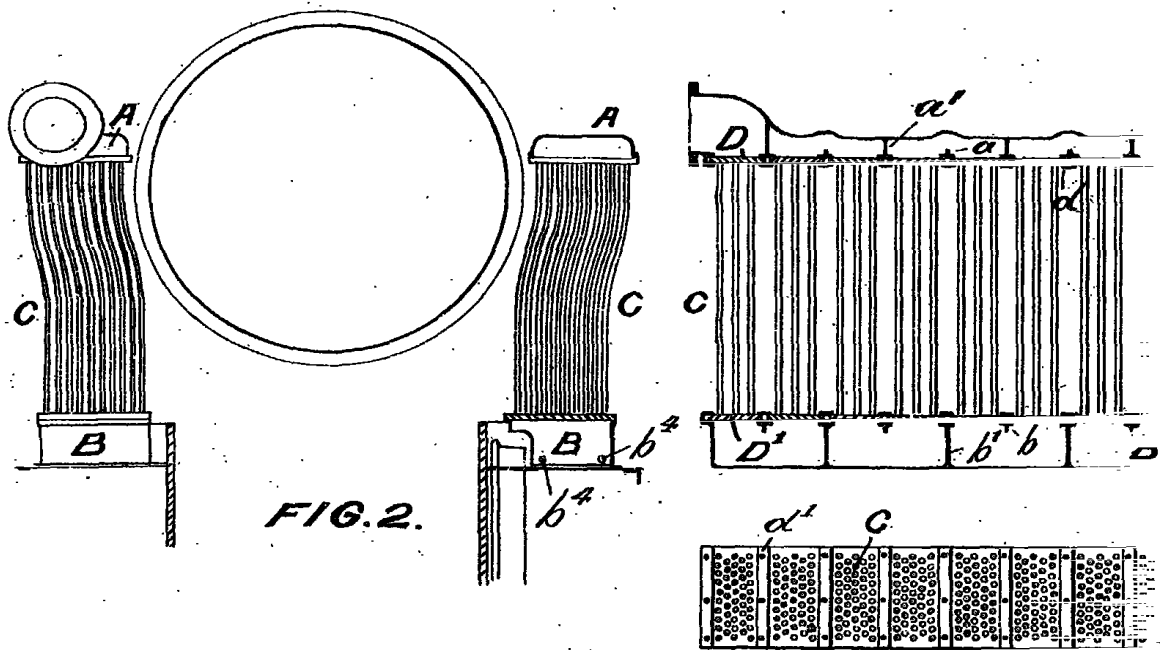


FIG. 2.

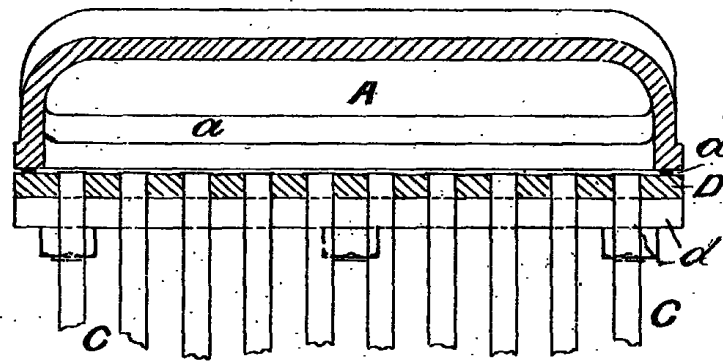


FIG. 5.

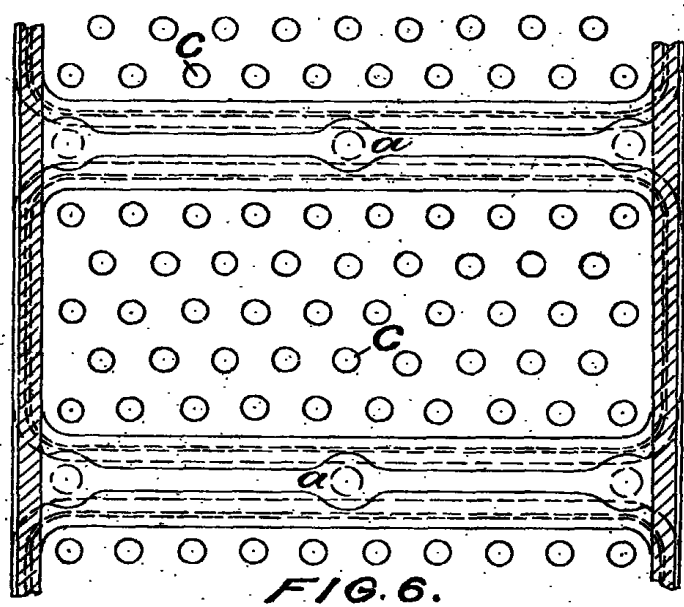
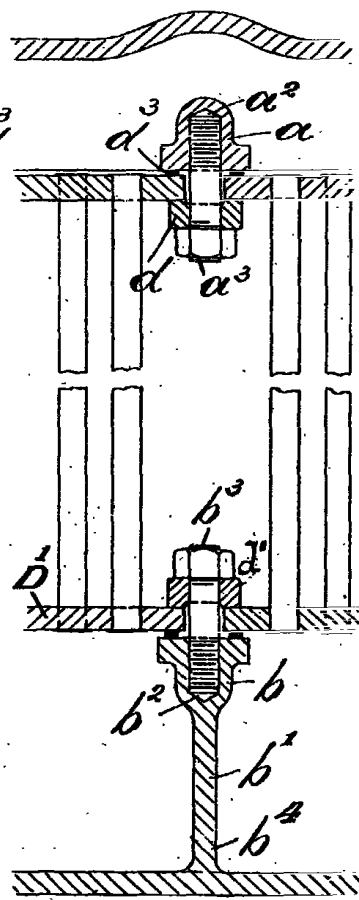


FIG. 6.

[This Drawing is a reproduction of the Original on a reduced scale.]

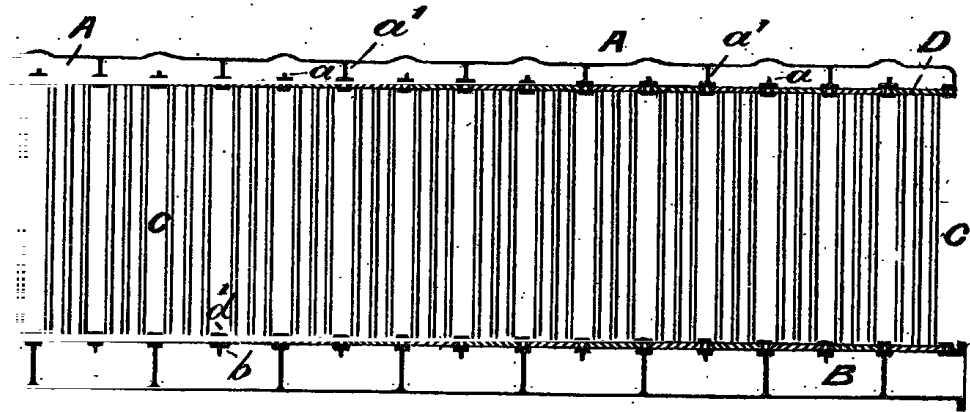


FIG. 1.

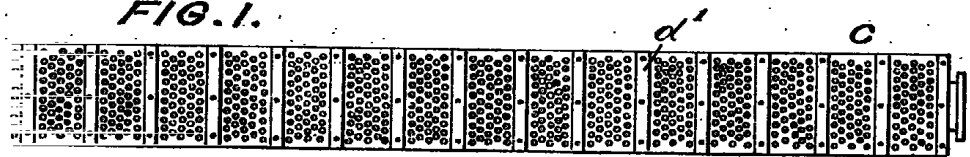


FIG. 3.

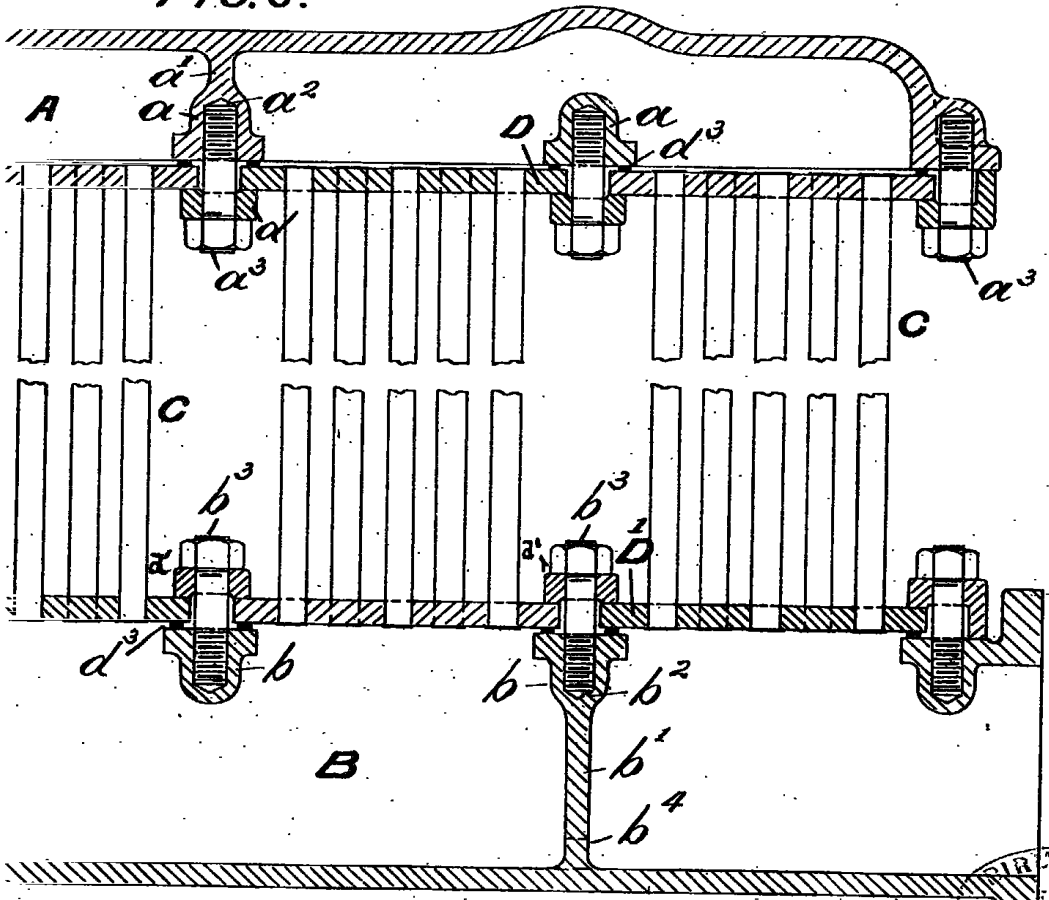


FIG. 4.

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