

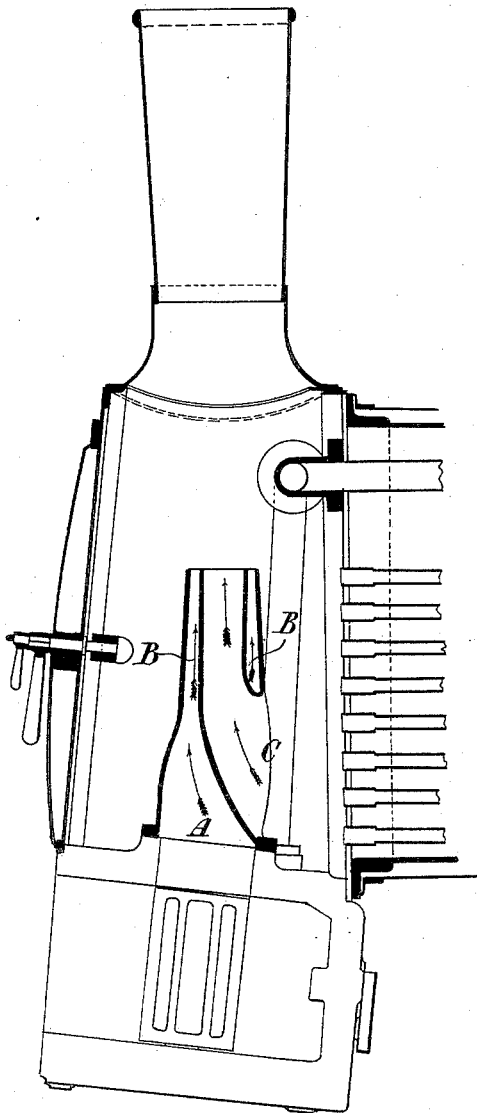
H. & W. ADAMS.

BLAST PIPE FOR LOCOMOTIVE ENGINES.

No. 341,865.

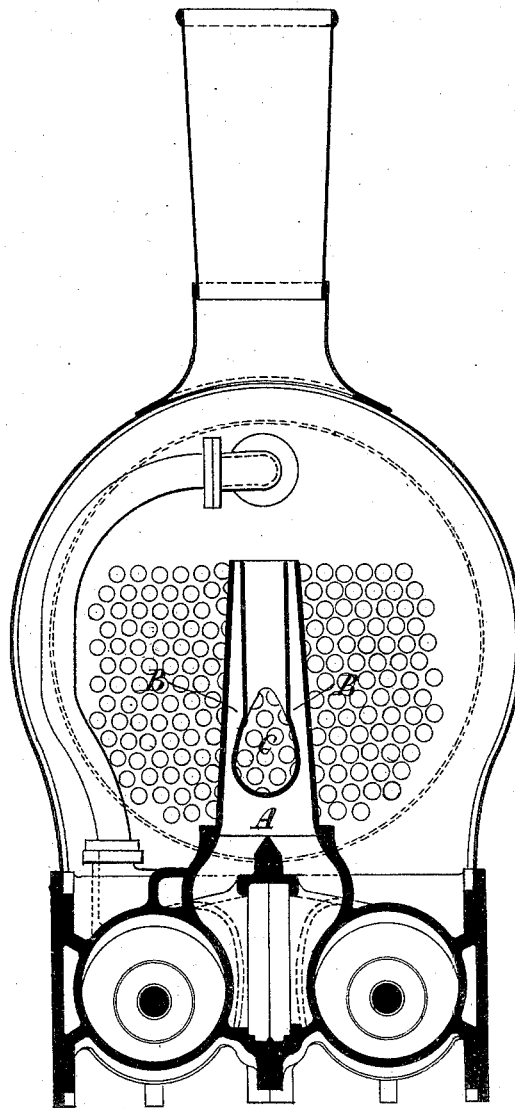
Patented May 18, 1886.

Fig. 2.



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Fig. 1.



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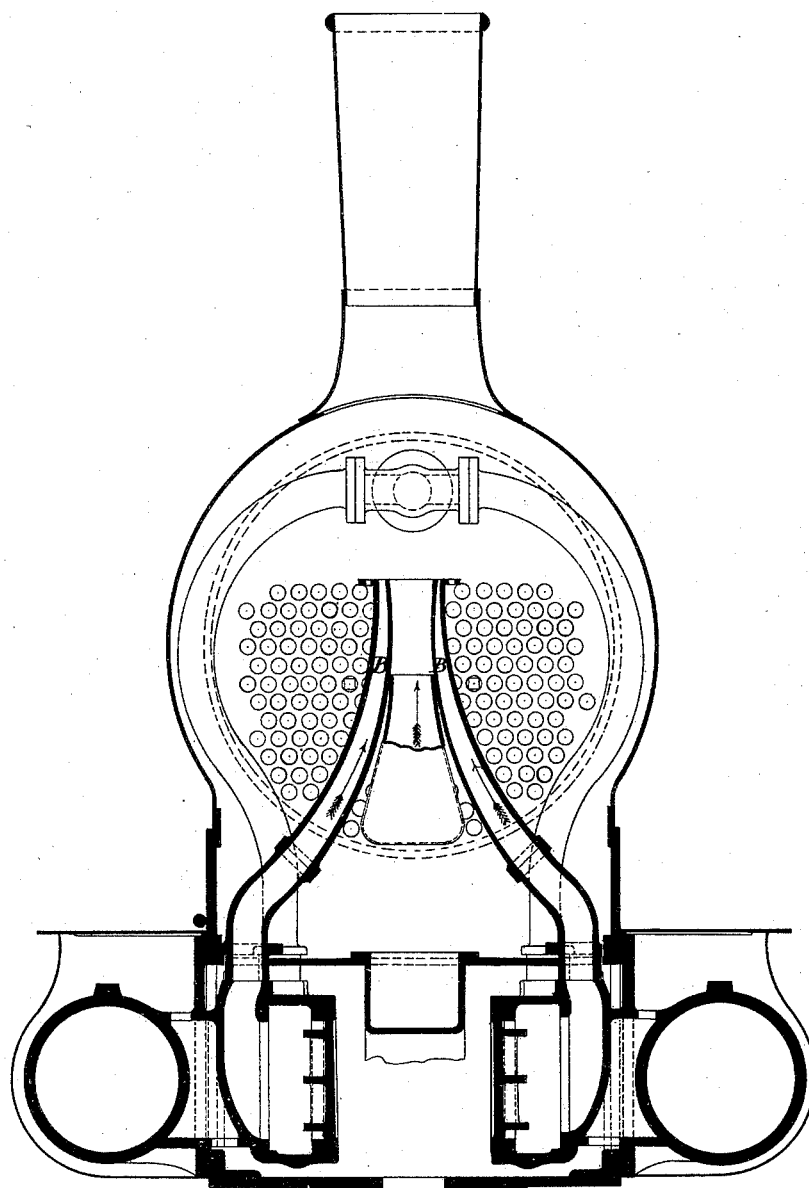
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Fig. 3.



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(No Model.)

3 Sheets—Sheet 3.

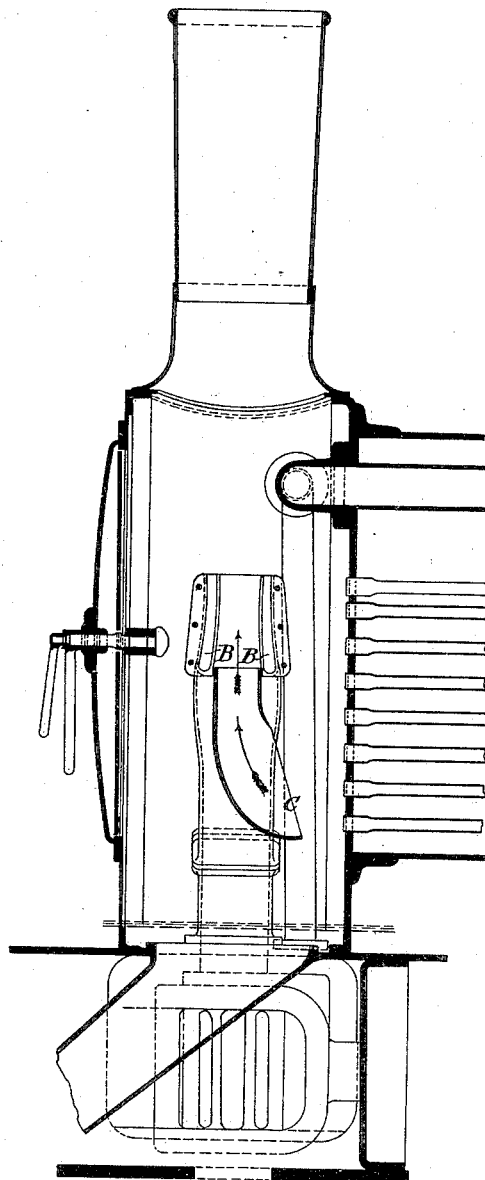
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Fig. 4.



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UNITED STATES PATENT OFFICE.

HENRY ADAMS, OF LONDON, AND WILLIAM ADAMS, OF NINE ELMS,
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BLAST-PIPE FOR LOCOMOTIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 341,865, dated May 18, 1886.

Application filed December 14, 1885. Serial No. 185,596. (No model.)

To all whom it may concern:

Be it known that we, HENRY ADAMS, of 60 Queen Victoria Street, in the city of London, England, civil and mechanical engineer, and
5 WILLIAM ADAMS, of Nine Elms, in the county of Surrey, England, locomotive engineer, subjects of the Queen of Great Britain, have invented certain new and useful Improvements in Blast-Pipes for Locomotive-Engines, applicable also to other uses, of which the following is a specification.

This invention has for its object improvements in blast-pipes for locomotive-engines, applicable also to other uses.

15 The draft in locomotive-engines is obtained by the discharge of the exhaust-steam from the cylinders into the chimney through a blast-pipe, and the steam discharged at high velocity from the blast-pipe induces a current of
20 air through the furnace and the tubes of the boiler. By our invention we render the action of the blast more effectual, generally, in accelerating the draft, and especially we render it more efficient in increasing the draft through
25 the lower tubes of the boiler, where, with the ordinary blast-pipe, the draft is less rapid than it is through the upper tubes. At present the blast is usually discharged in a solid jet into the smoke-box adjacent to the chimney
30 through an orifice which is circular in section, and consequently the jet of steam issuing from it presents a comparatively small surface to engage with the products of combustion in the smoke-box, and so to carry them to the
35 chimney. We increase this surface by so forming the jet that the steam issues in a thin sheet or annulus; but we are aware that it is not new to cause the discharge of steam around the upper end of a blast-pipe in a thin sheet or annulus, and we do not claim that, our invention being limited to certain improvements in which that feature is employed, and
40 our design being especially to improve the draft through the lower tubes of a boiler-shell. In addition to this, we curve the elongated and narrow orifice, as it is seen in plan, and this curvature may be carried so far that at and
45 near the top of the blast-pipe the ends of the orifice meet and form a complete annulus, while lower down is an open mouth leading
50 into a cavity, from which the only outlet is

through the center of the annular aperture and the jet issuing from it into the smoke-box beneath the chimney. This open mouth, consequently, is exposed to a powerful suction, and it is immediately in front of the ends
55 of the lower boiler-tubes, the draft through which it is desired to encourage. Screens may also be provided to insure that the draft into this mouth shall be supplied entirely or mainly
60 by the lower boiler-tubes. We sometimes provide a movable mouth to avoid obstruction to the tubes. These blast-pipes reduce back-pressure, and are useful, not only in locomotive-engines but elsewhere, when a jet of steam
65 is employed to carry with it air or products of combustion.

In order that our said invention may be most fully understood and readily carried into effect, we will proceed to describe the drawings
70 hereunto annexed.

In the drawings, Figure 1 is a transverse vertical section of a locomotive-engine to which our improved blast-pipe is applied. Fig. 2 is a vertical and longitudinal section of the fore
75 part of the same engine. The engine here shown is of the inside-cylinder type. Similar views of an engine of the outside-cylinder type are shown by Figs. 3 and 4.

In the arrangement shown in Figs. 1 and 2
80 the steam passing from both the cylinders meets at the base of the blast-pipe at A. At the lower part the blast-pipe is convex in front and concave in rear, where it faces the ends of the boiler-tubes, and as the blast-pipe rises
85 the curvature of the outer and inner surfaces increases until at B they meet, and the space between them becomes annular. The steam ascending from A between the two surfaces
90 issues from the upper end of the blast-pipe in the form of a cylindrical or hollow jet into the smoke-box beneath the chimney. At the lower part of the blast-pipe, in front of the lower boiler-tubes, there is an open mouth, C, leading into the cavity of the annular upper
95 part of the blast-pipe. The steam in issuing produces a strong draft through the mouth, consisting, in great part, of the gases issuing from the lower boiler-tubes. The draft of these tubes is thus improved, and also, generally, the draft of the boiler is improved in consequence of the increased surface given to the
100

jet of issuing steam, the steam being thus applied more efficiently to carry forward the products of combustion from the smoke-box into the chimney.

5 In Figs. 3 and 4 the steam is brought from the cylinders by two pipes, one from each cylinder. These unite at the top at B in a double ring, and they convey the steam into the annular space within the ring. In this case the
10 mouth at C is at the lower end of a movable piece projecting downward from the double ring, and, as before, it faces the lower boiler-tubes. As before, the steam issuing from the ring in the form of an annular jet produces a
15 brisk suction through the mouth, and this is supplied by the gases issuing from the lower boiler-tubes.

20 In place of forming the mouth C in a movable piece, as shown, a screen or screens may be otherwise arranged to direct the gases from the lower boiler-tubes into the interior of the annulus.

25 Although we prefer that the mouth of the blast-pipe should form a complete annulus, still the advantages of the invention are in part obtained where it is not so made. The draft is much improved by forming the jet-orifice or outlet of the blast-pipe which opens

into the smoke-box as a long narrow slit, whether this slit be made endless and becomes 30 an annulus or otherwise.

Arrangements such as above described for use in locomotives may also advantageously be applied in traction-engines and in portable and like engines, and are applicable in other 35 cases in which it is desired to apply steam to impart motion efficiently to air or other gases.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, 40 we declare that what we claim is—

In an engine, the combination, with the boiler-flues, of a curved blast-pipe with its enlarged opening C in front of the forward ends of the lower boiler-tubes, surrounded at 45 its top by an annular steam-discharge orifice, B, substantially as and for the purpose set forth.

London, December 2, 1885.

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