

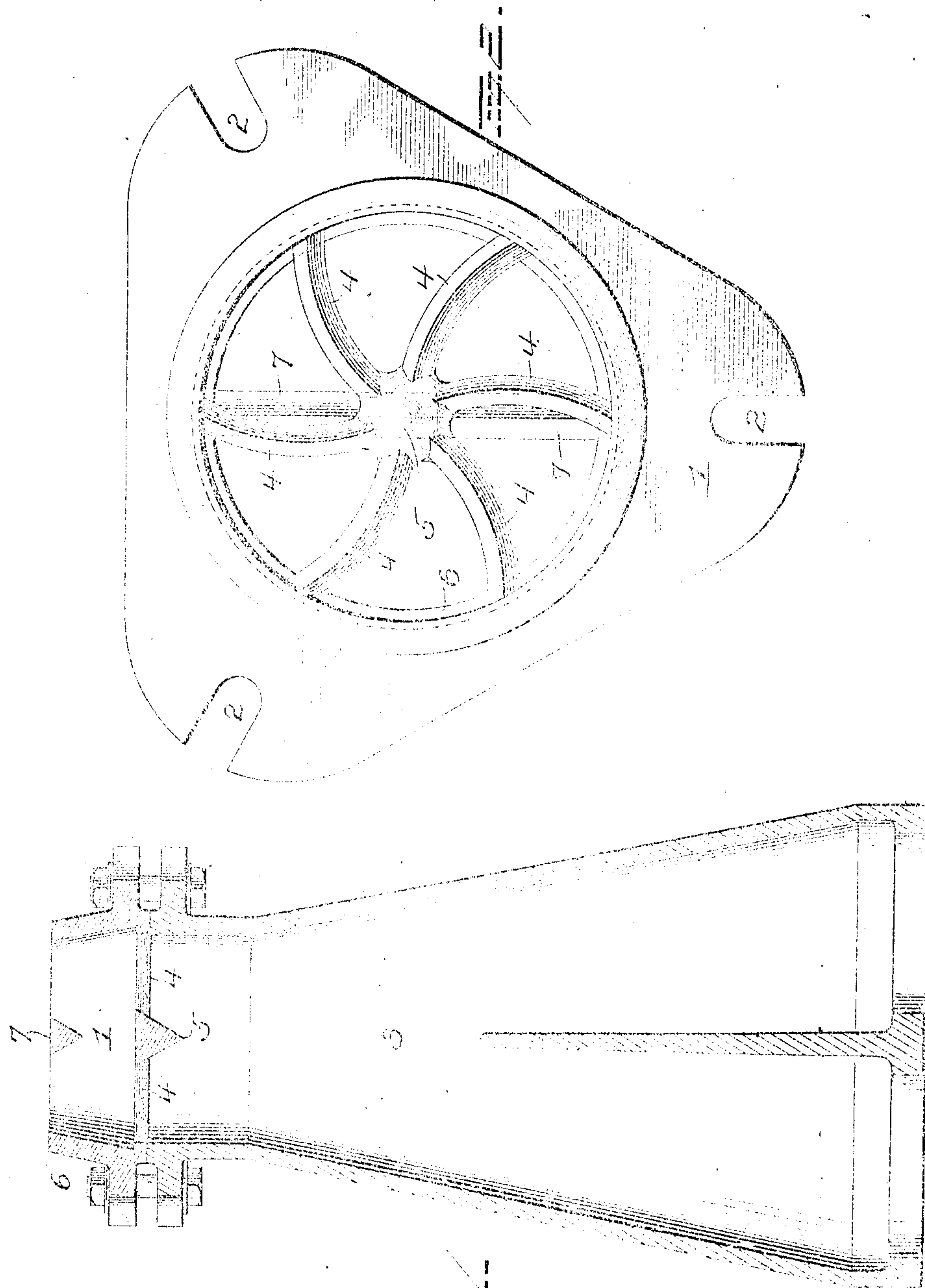
No. 892,482.

PATENTED JULY 7, 1908.

C. F. WILDE.

EXHAUST NOZZLE.

APPLICATION FILED JUNE 7, 1907.



WITNESSES

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# UNITED STATES PATENT OFFICE.

CHARLES FREDERICK WILDE, OF JACKSON, TENNESSEE.

## EXHAUST-NOZZLE.

No. 892,482.

Specification of Letters Patent.

Patented July 7, 1902.

Application filed June 7, 1907. Serial No. 377,313.

*To all whom it may concern:*

Be it known that I, CHARLES FREDERICK WILDE, of Jackson, in the county of Madison and State of Tennessee, have invented certain new and useful Improvements in Exhaust-Nozzles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in exhaust nozzles for locomotives, the object of the invention being to provide a construction that will prevent to a large extent back-pressure without retarding or interfering with the forced draft, and it consists in the details of construction and combinations of parts as will be more fully described and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in section of a nozzle having my improvement applied thereto, and Fig. 2 is a bottom plan view of the same.

1 represents the base of the nozzle preferably triangular in section and provided at its corners or angles with open slots 2 for its attachment to the upper end of the exhaust pipe 3 of a locomotive or other engine where forced draft is used. This base 1 is provided with a centrally located opening preferably circular and bridged or spanned by a series of arms 4, the latter being either straight or curved longitudinally and triangular in cross section, the inner ends of the several arms 4 being rigidly secured to the centrally located inverted cone 5 near the base of the latter. The arms 4 are flat on top and V-shaped below and while I have shown them integral with the nozzle they may be separate therefrom, and be located below the plane of the upper end of the exhaust pipe 3.

The portion 6 of the nozzle projecting up from the base is slightly conical and is provided at a point above the arms 4 with a centrally located cross-bar 7 V-shape in cross section.

With this construction, as the exhaust steam is projected through the pipe 3 its speed, owing to the reduction in area of the pipe 3 is accelerated as it approaches the nozzle. As the steam reaches the V-shaped cross arms 4, it is further contracted in its passage between the arms, and suddenly expanded above the arms. This expansion in the nozzle reduces the back pressure in the

pipe, and also retards, to a certain extent, the speed of the exhausting steam, thus causing it to issue from the nozzle in the form of a continuous stream rather than in quick and separate puffs, producing a practically continuous draft through the boiler and furnace, and insuring more perfect and even combustion of the fuel, without the agitation of the fuel incidental to the separate and distinct drafts caused by the steam issuing in separate and distinct blasts from the nozzle.

The V-shaped cross bar 7 at the top tends to divide the steam and deflect it toward the side of the stack, thus thoroughly combining the products of combustion with the exhaust steam at the exit end of the nozzle where velocity of the steam is the greatest, thus completely filling the stack from side to side with mixed steam and gases, which obviates to a large extent the sharp exhaust common in locomotive engines.

Having fully described my invention what I claim as new and desire to secure by Letters-Patent, is:—

1. The combination with an exhaust nozzle, of a series of V-shaped arms radiating from the center of its base to points adjacent to the base of the wall of the nozzle and means dividing the upper end of the nozzle into two parts.

2. An exhaust nozzle having conical form and provided with a series of arms radiating from the center of its base to the sides of the base thereof, and an inverted cone depending from the juncture of the arms and a single cross bar extending across the top of the conical nozzle.

3. An exhaust nozzle provided with a series of curved arms V-shape in cross section radiating from the center to the sides of the base of the nozzle and a single cross bar also V-shaped in cross section, at the top of the nozzle.

4. An exhaust nozzle having conical form and provided with a series of curved arms V-shape in cross section radiating from the center to the sides of the base, an inverted cone depending from the juncture of the arms and a single cross bar extending across the top of said conical nozzle.

5. An exhaust nozzle provided with a series of curved arms V-shape in cross section radiating from the center to the sides of the base of the nozzle, an inverted cone depending from said arm at the juncture of the



latter and a V-shape bar within said nozzle at the top of the latter, the space between said arms and cross bar being unobstructed.

6 6. An exhaust nozzle provided at its top with a single cross bar and at its base with a series of radial arms, the combined area of the openings formed by said arms being greater than the combined area of the openings at the top of the nozzle.

10 7. An exhaust nozzle provided at its top with a single cross bar and at its base with a series of curved radial arms, the combined area of the openings between said arms being greater than the combined area of the openings at respective sides of the cross bar at the top of the nozzle.

15 8. An exhaust nozzle provided at its top with a single cross bar having a V-shaped cross section, and at its base with a series of 20 radial arms, each having a V-shaped cross

section, the combined area of the openings between said arms being greater than the combined area at respective sides of the cross bar at the top of the nozzle.

9. An exhaust nozzle provided with a single cross bar extending across the top, a depending conical portion having its top approximately in the plane of the bottom of the nozzle, and a series of radial arms at the base of the nozzle, said arms extending from said conical portion to the wall of the nozzle at the base of the latter.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

CHARLES FREDERICK WILDE.

Witnesses:

J. W. VANDER,  
W. R. THEUS.