

(No Model.)

2 Sheets—Sheet 1.

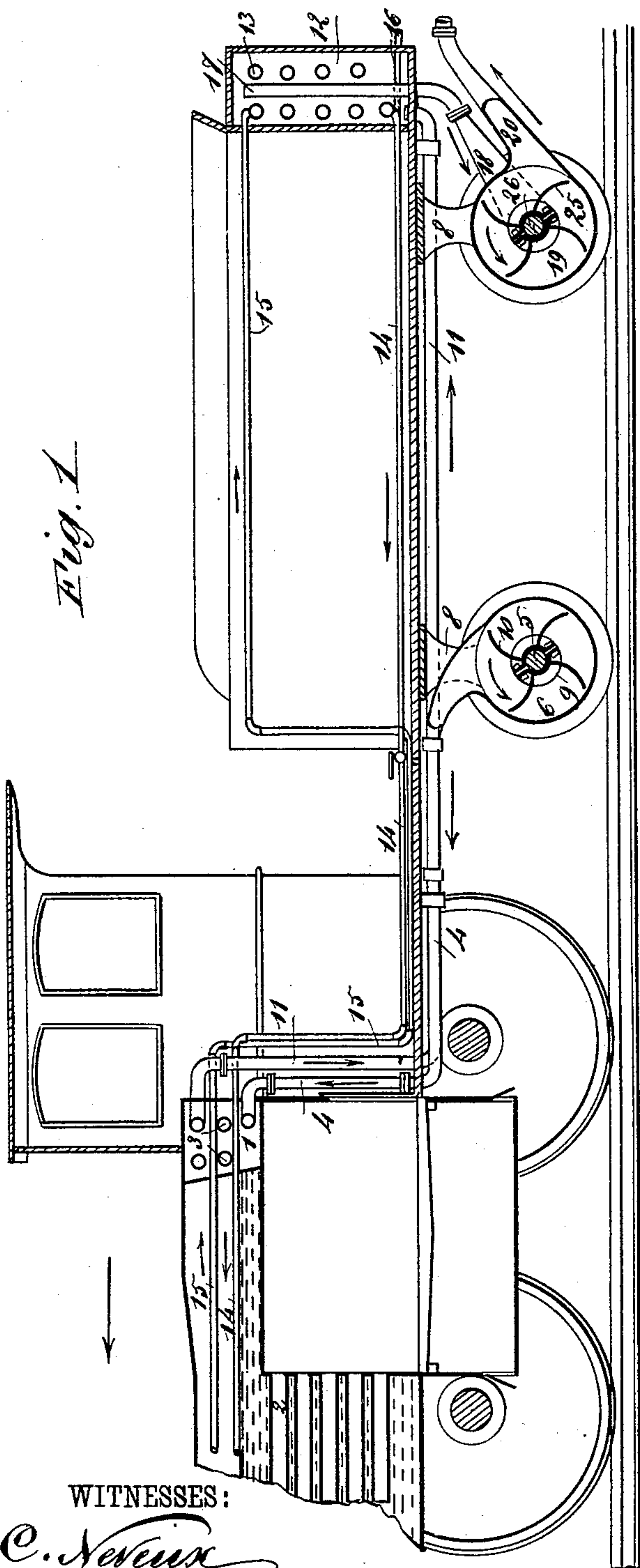
J. H. BALLARD, Jr.

APPARATUS FOR HEATING RAILWAY CARS.

No. 366,445.

Patented July 12, 1887.

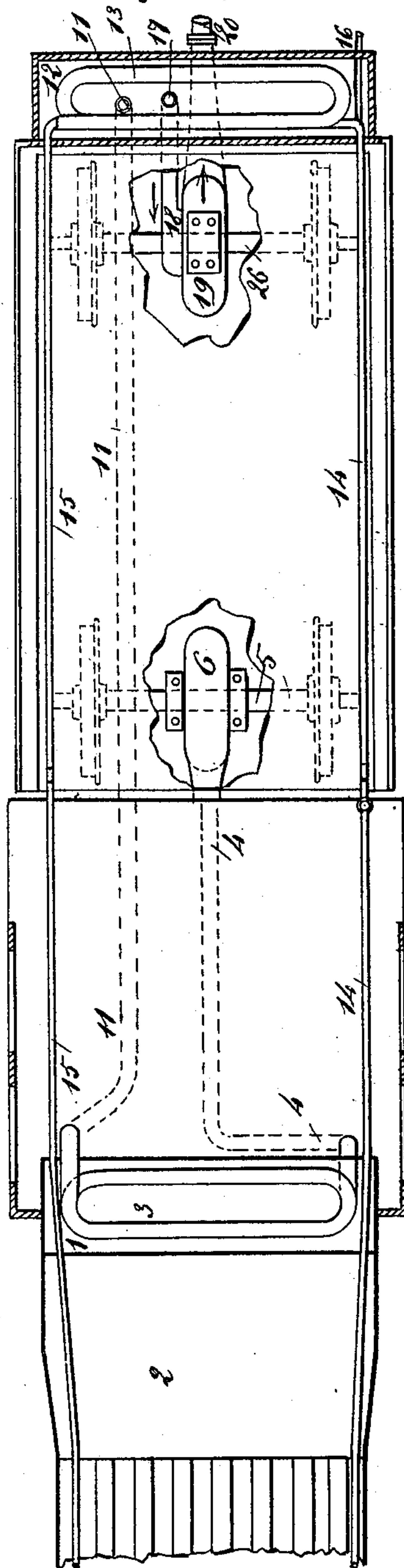
Fig. 1



WITNESSES:

C. Verneux
W. Sedgwick

Fig. 2



INVENTOR:

J. H. Ballard Jr.
BY *Munn & Co.*
ATTORNEYS.

(No Model.)

2 Sheets—Sheet 2.

J. H. BALLARD, Jr.

APPARATUS FOR HEATING RAILWAY CARS.

No. 366,445.

Patented July 12, 1887.

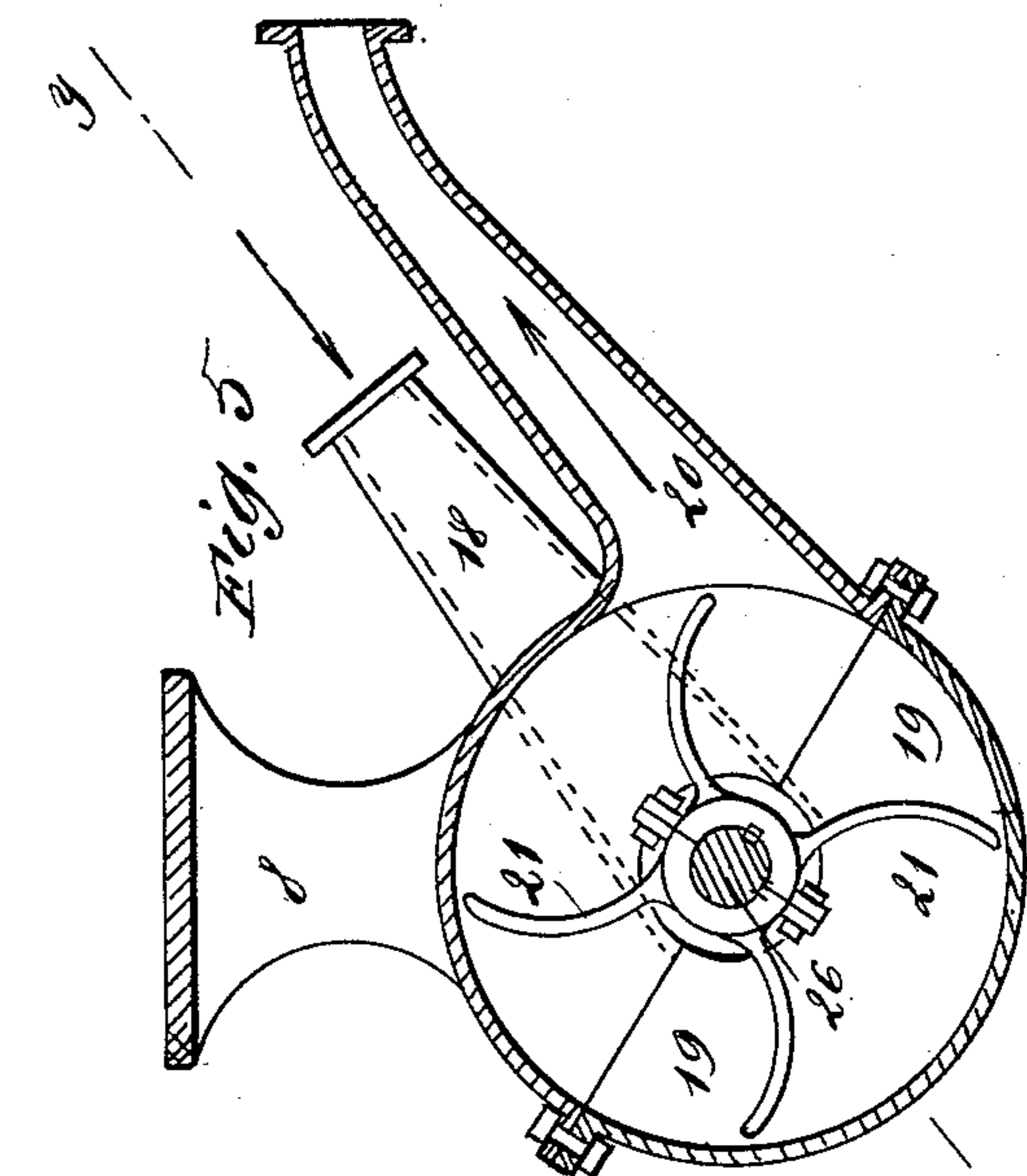


Fig. 5

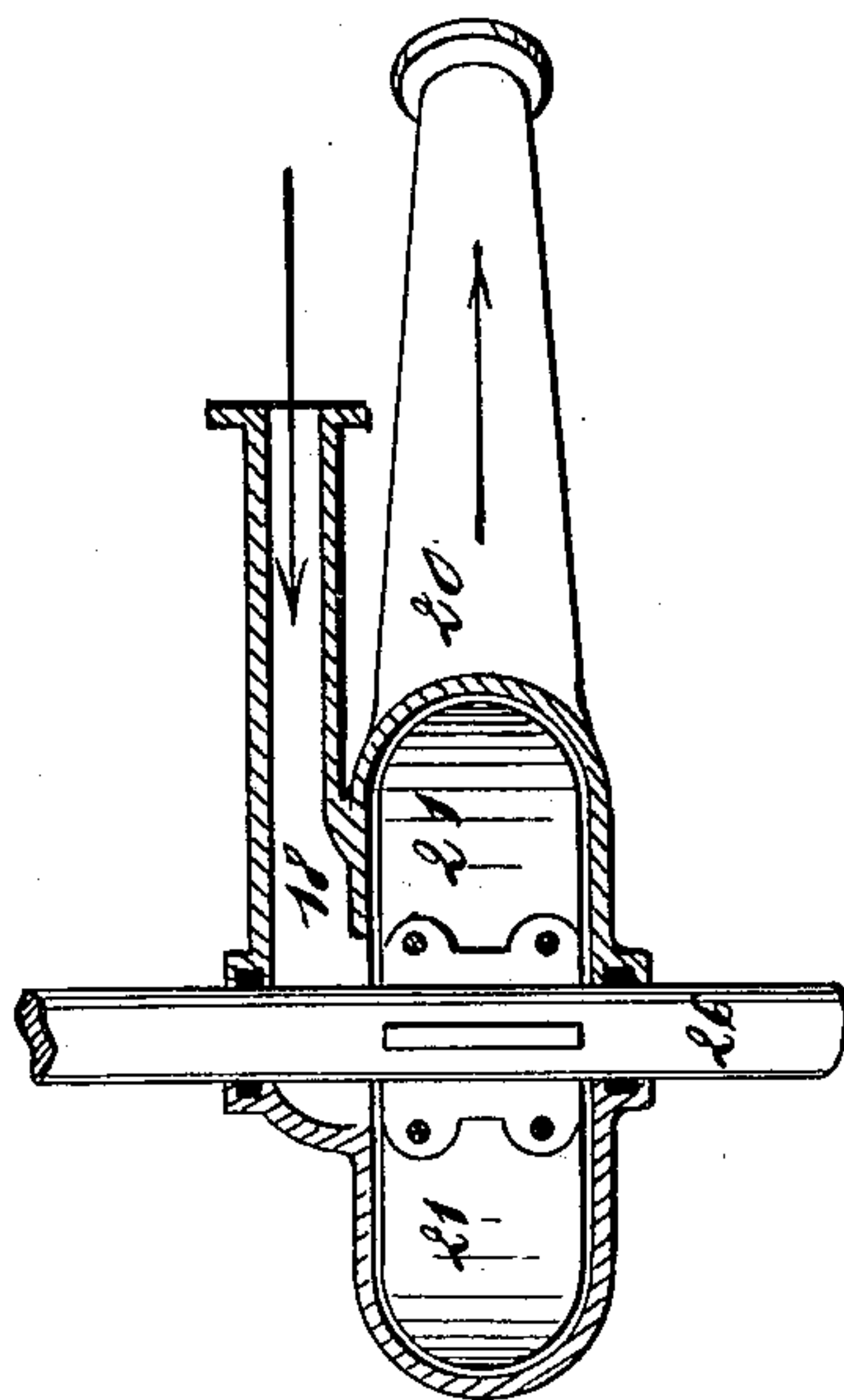


Fig. 6

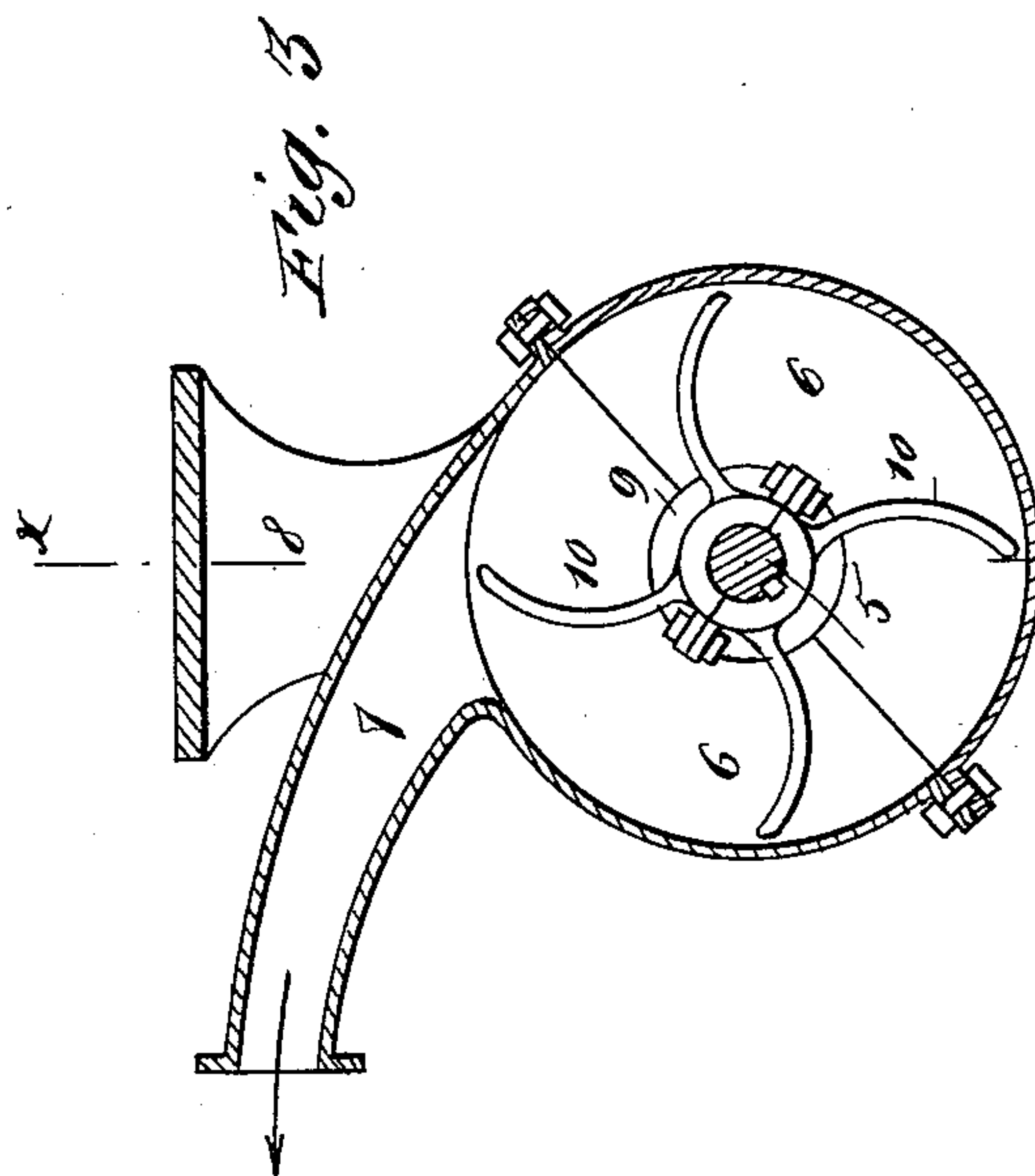


Fig. 3

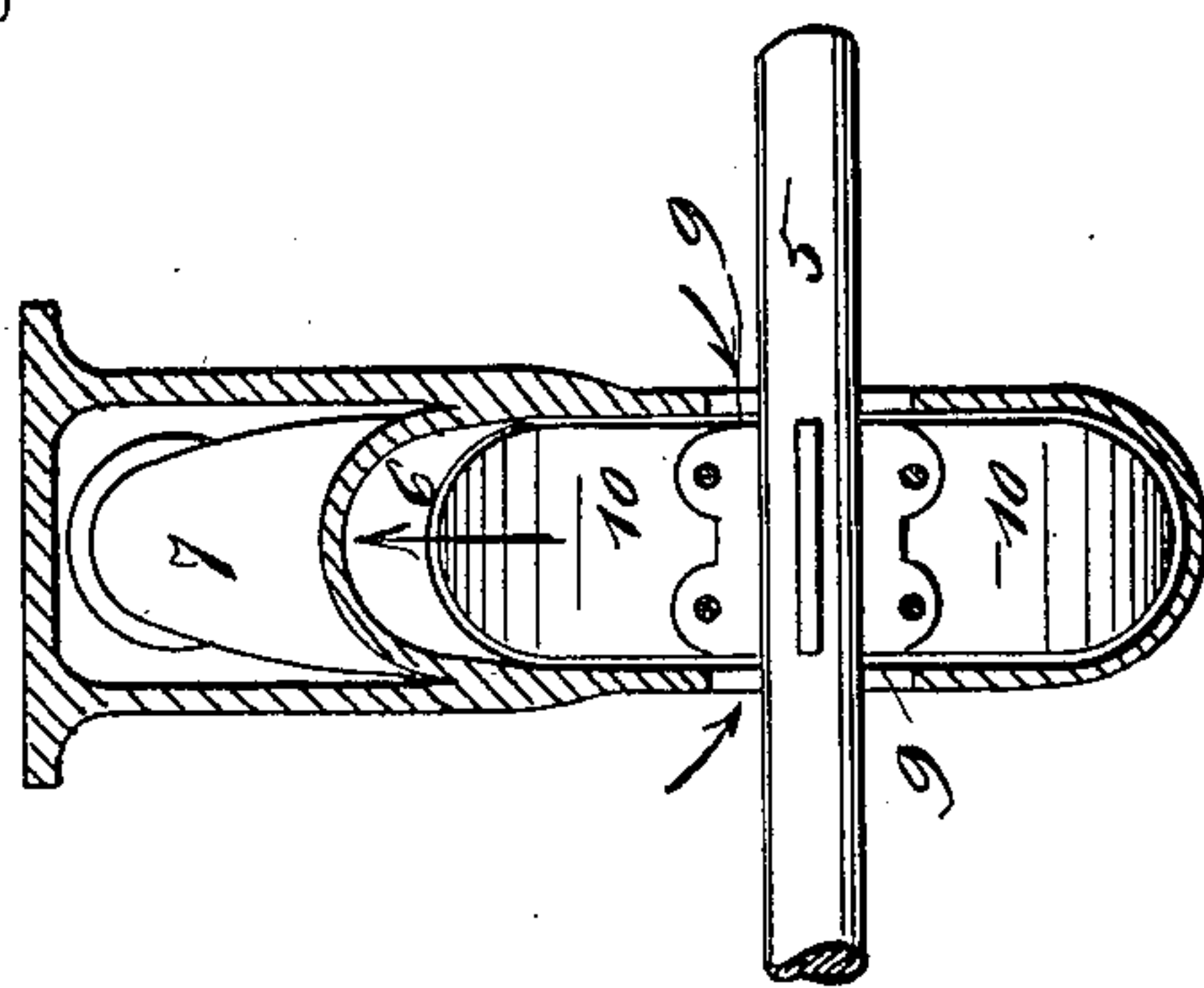


Fig. 4

WITNESSES:

C. Neveux
Co. Bidgwick

INVENTOR:

J. H. Ballard Jr.
BY *Munn & Co.*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN H. BALLARD, JR., OF COHOES, NEW YORK.

APPARATUS FOR HEATING RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 366,445, dated July 12, 1887.

Application filed February 11, 1887. Serial No. 227,319. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. BALLARD, Jr., of Cohoes, in the county of Albany and State of New York, have invented a new and Improved Apparatus for Heating Railway-Cars, of which the following is a full, clear, and exact description.

My invention consists in an improved hot-air apparatus for heating railway-cars, as will be hereinafter fully described and claimed.

The invention also consists in the apparatus employed in carrying out the above method, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a longitudinal vertical section through an engine and tender, illustrating the application of my method; and Fig. 2 is a plan view of the same, partially sectional. Fig. 3 is a central vertical and longitudinal section through the fan attached to the forward axle of the tender, and Fig. 4 is a transverse vertical section of the same through line *xx*. Fig. 5 is a central vertical and longitudinal section through the fan attached to the rear axle of the tender, and Fig. 6 is a transverse section thereof through line *yy* of Fig. 5.

In carrying out the invention a chamber, 1, is provided within the boiler 2 of a locomotive, preferably above the crown-sheet, extending transversely the same at the front, as shown in Figs. 1 and 2. The said chamber may, however, be placed within the fire-box if found desirable.

Within the chamber 1 a coil of pipe, 3, is placed, the lower end of which coil projecting from the said chamber is coupled to a pipe, 4, adapted to extend downward parallel with fire-box beneath the cab and tender to a point in advance of the forward axle, 5, of the tender, where a coupling is effected with a blower-casing, 6.

The blower-casing 6, as shown in detail, Fig. 3, and also in Fig. 1, is divided into two equal sections, the upper section having integral therewith an elongated mouth, 7, to which the aforesaid coupling is made, and a bracket, 8, adapted to be attached to the bottom of the tender above the axle, whereby the casing is

supported in position, the under section being securely bolted to the upper section, as shown in Fig. 3. The casing 6 does not close tightly around the axle, an intervening annular space, 9, being provided, through which air is admitted.

Within the casing 6 a fan, 10, is clamped over and keyed to the forward axle of the tender, which fan is adapted to be rotated within the casing by the said axle. The object of this construction is to supply air to the coil within the heating-chamber 1 by the movement of the engine and tender.

The upper end of the coil 3 is also projected through the rear side of the chamber 1, having coupled thereto a supply-pipe, 11, which, extending downward through the cab-floor, is carried rearward beneath the cab and tender, as shown in dotted lines, Fig. 2, and positive lines, Fig. 1, to a connection with a tank, 12, situated to the rear of the tender, entrance being effected at the bottom.

Within the superheating tank or chamber 12 a pipe, 13, is coiled from top to bottom, connected at top and bottom by pipes 14 and 15 with the boiler of the engine, the top pipe, 15, to supply live steam to the coil, the lower pipe, 14, being purposed to convey the drip and exhaust back to the boiler. The steam-supply pipe may be provided with a branch, 16, adapted to supply steam to the air-brakes. Each of the aforesaid pipes is supplied with an elastic section between the cab and tender to admit of turning curves.

A stand pipe, 17, is provided in the superheating tank or chamber 12, having connection at its lower end with the mouth 18 of a fan-casing, 19, encircling the rear axle, 26, of the tender, which casing, although constructed and supported in substantially the same manner as the fan-casing of the forward axle of the tender, is made to closely cover the axle 26, as shown in Figs. 5 and 6. A second tubular connection, 20, is provided, the rear fan-casing, 19, made integral therewith, adapted to couple with the usual pipe leading to the heaters of the coaches. Within the casing 19 a fan, 21, is attached to the rear axle, 26, of the tender, which fan is similar in shape and construction and rotated in like manner to the fan upon the forward axle.

In operation, as the train is propelled either

forward or back, air is sucked in from beneath the tender by the fan upon the forward axle of said tender and forced up in the coil within the chamber 1. The air passing through the 5 coil is heated and introduced into the auxiliary heating-chamber 12, where it is superheated by the steam-coil 13. The heated air is withdrawn from the superheating-chamber through the stand pipe 17 by the fan 21, and 10 the heated air is thereupon forced by the said fan through its outlet 20 into the heating-pipes of the several carriages. A constant circulation of steam is obtained between the chamber 12 and the boiler through the pipe 15 15, coil 13, and return-pipe 14. It will therefore be observed that the air is first heated in the chamber 1, and then again heated in the auxiliary chamber 12.

Although the use of the superheater 12 is 20 desirable to maintain the heat in the current of air, still it is not essential and may be dispensed with without departing from the spirit of my invention. Neither do I limit myself to the manner shown for conveying the air 25 through the boiler.

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

1. The combination, with a heating-chamber located within the boiler, a superheating-chamber to the rear of the heating-chamber, 30 and a steam-pipe leading from the boiler to the superheater, and a pipe leading from the coil in the heater to the superheater, of a blower attached to the front axle of the tender 35 to supply air to the coil in the heater, and a sealed blower attached to the rear axle of the tender to force the heated air from the superheater to the cars, substantially as set forth.

2. The combination, with the heating-chamber 1 in the boiler, provided with a coil, 3, 40 and a fan, 10, attached to the forward axle of the tender, provided with an open casing, 6, and adapted to force air in said coil, of a superheating-chamber, 12, at the rear of the tender, 45 provided with a coil, 13, supplied with steam from the boiler, a hot-air pipe leading from the coil 3 to the superheater, and a closed blower attached to the rear axle of the tender to force the air from the superheater to the 50 cars, substantially as set forth.

JOHN H. BALLARD, JR.

Witnesses:

JOHN BALLARD,
FRED C. HAM.