

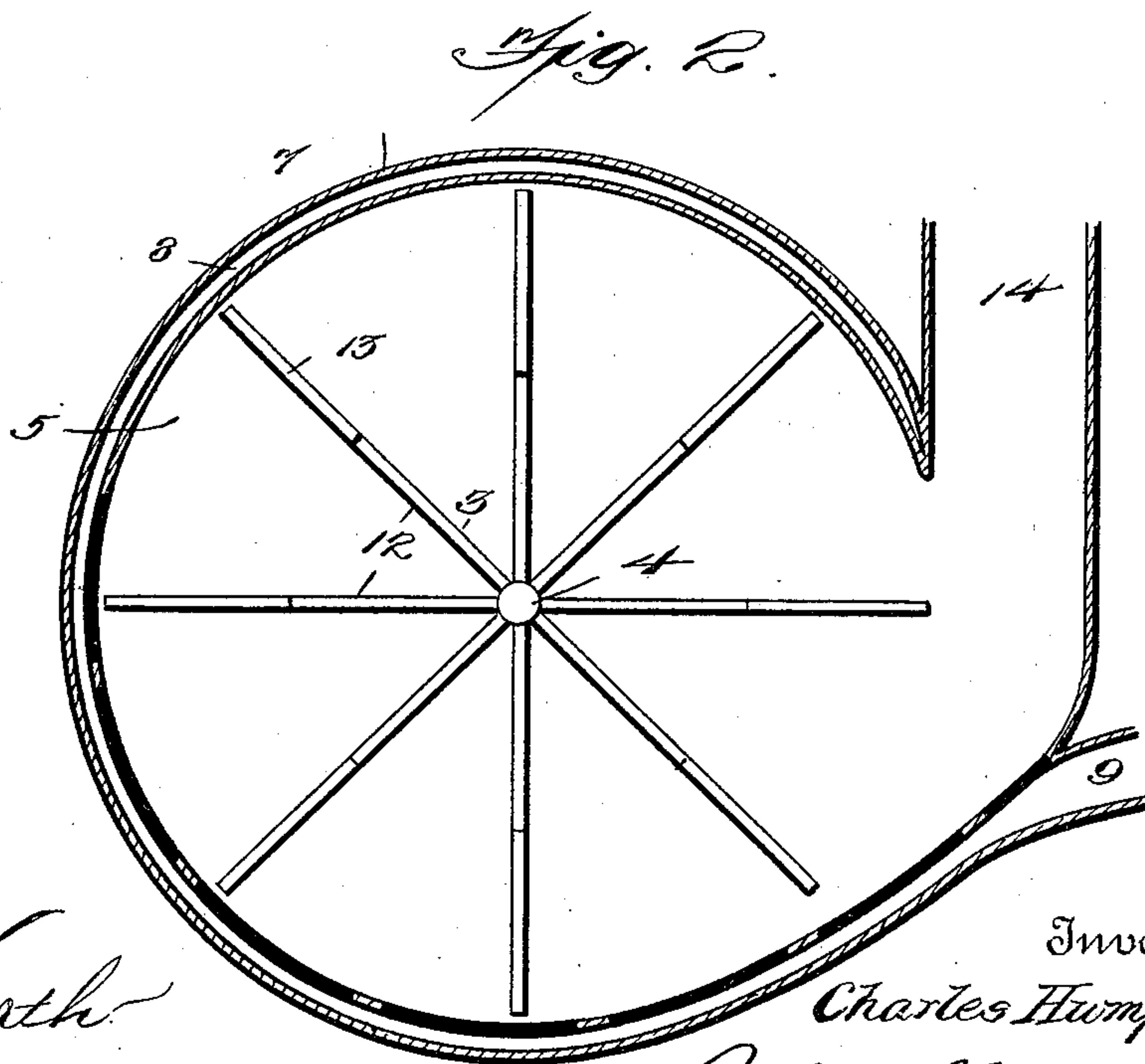
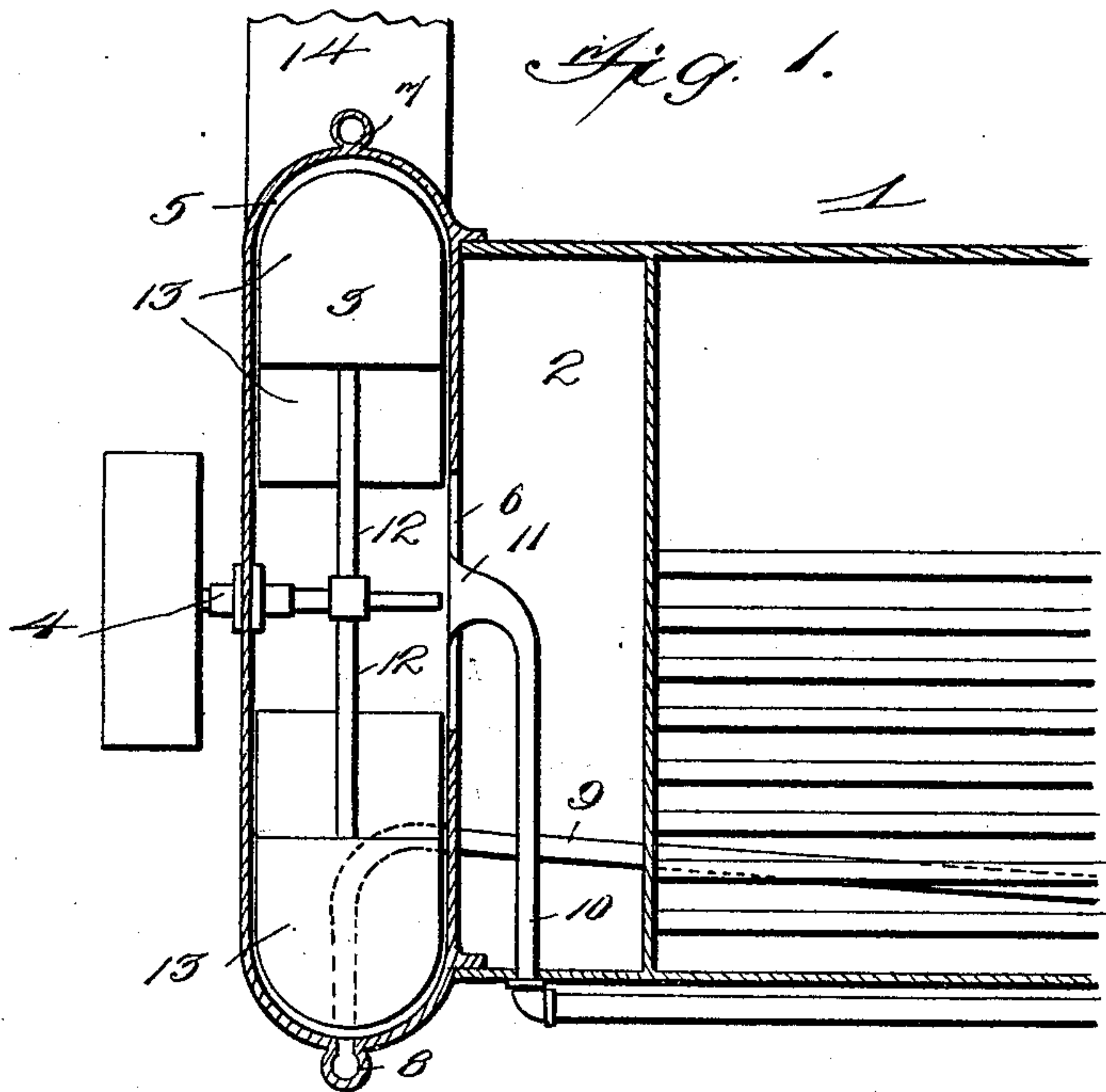
No. 607,747.

Patented July 19, 1898.

C. HUMPHREY.
ATTACHMENT FOR LOCOMOTIVE ENGINES.

(Application filed Sept. 17, 1897.)

(No Model.)



Witnesses
Loerth
Victor J. Evans

Inventor
Charles Humphrey,
by John Meddlerburn
Attorney

UNITED STATES PATENT OFFICE.

CHARLES HUMPHREY, OF ALMOND, NEW YORK.

ATTACHMENT FOR LOCOMOTIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 607,747, dated July 19, 1898.

Application filed September 17, 1897. Serial No. 652,032. (No model.)

To all whom it may concern:

Be it known that I, CHARLES HUMPHREY, a citizen of the United States, residing at Almond, in the county of Allegany and State of New York, have invented certain new and useful Improvements in Attachments for Locomotive-Engines; 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.

This invention relates to an attachment to locomotive-engines or for other purposes; and it consists, essentially, of a combined spark-arrester, smoke-conveyer, and cinder-retainer of a specific form.

The invention further consists of the details of construction and arrangement of the several parts, which will be more fully hereinafter described and claimed.

It is a common practice to contract the exhaust-nozzles of all locomotive-engines for the purpose of creating sufficient draft through the boiler to maintain the steam to supply the engine. This has had the effect of creating a heavy back pressure on the engine, especially at high speed.

One object of the present invention is to create the necessary draft by means of an exhaust-fan, which will institute a partial vacuum in the smoke-box, and also to lead the exhaust-pipe at full size or bell-mouthed to the eye of said fan and prevent back pressure on the piston and also create a slight vacuum in favor of the engine.

A further object of the invention is to increase the power and efficiency of the engine with less or at least no increase in the consumption of fuel.

In the accompanying drawings, Figure 1 is a sectional view of a portion of a locomotive-engine, showing the invention applied thereto. Fig. 2 is a section on the line $x x$ on an enlarged scale.

Referring to the drawings, which illustrate one mode of applying the invention and wherein similar numerals of reference are employed to indicate corresponding parts in the several views, the numeral 1 designates a locomotive-boiler which is supplied with the usual appurtenances incidental thereto. In the front part of the smoke-box 2 a fan 3

is mounted on a shaft 4, the latter being driven to actuate the fan by any suitable form of steam or other motor. (Not shown.) The said fan is inclosed in a compartment 5, and the rear wall of said compartment is provided with an opening 6 directly in line with the eye of the fan. The compartment 5 is in the form of a casing, preferably oval in shape, and has a small crack or slot 7 in the center thereof opening into a small inclosed space or pipe 8, outside of the fan-case proper, and leading back by suitable conveying-pipe or other analogous device 9 to the front of the fire-box or the ash-pan. Extending upwardly through the smoke-box 2 and in rear of the fan-casing is an exhaust-steam pipe 10, which has connection with the cylinders of the engine to take the exhaust-steam therefrom and convey it by means of a bell mouth 11 through the opening 6 in the fan-casing directly to the eye of the fan. The said fan comprises a series of arms 12, on the outer ends of which are fixed blades 13, and also leading from said casing is a hot-air and exhaust-steam pipe 14, running to the smoke-stack or exteriorly of the engine in any other manner desired.

The smoke and particles of combustion coming through the fan enter the rear portion of the smoke-box and are directed by the suction set up by the exhaust-steam and also the fan into the fan-casing and forced back through the pipe or analogous device 9 to the front of the fire-box or ash-pan. The cinders are forced through the crack or slot in the fan-casing into the surrounding space exterior of said casing by the air and centrifugal force and are blown along the pipe to the point set forth, where a reconsumption will take place and materially reduce the amount of fuel necessary in firing an engine under the ordinary circumstances.

The advantages of the use of a device of the character set forth are manifold, and among others may be mentioned preventing smoke from settling over the top of the boiler and obscuring the view of the engineer, especially in rounding curves; also, cinders, dust, and dirt are prevented from entering the cars in the rear of the locomotive, and in this connection, instead of passing through the pipe or other analogous device 9, they

might be conveyed by a series of pipes to the rear of the train, and these pipes could also be used as conduits to contain the pipes that are usually employed in steam-heating of cars. This would prevent freezing of the said steam-heating pipes in cold weather and also obviate condensation.

The invention might equally well be applied to fast steamships or other vessels employed in naval warfare instead of the immense smoke-stacks now in use, which consume a large amount of power to drive through the air at the usual rate of speed and which is resisted by the wind in case of head winds. In this application of the invention the necessary draft would be produced by exhaust-fans similar to those heretofore set forth, and the particles of combustion and gases would be discharged at the stern of the vessel. The advantage in this application to be gained in naval vessels would be not only increase of speed, but less liability to be seen by the enemy, as there would be less smoke, and what did exist would be discharged near the water and could not be seen at a great distance.

Other applications might also be made of the invention, and it is obviously apparent that many minor changes in the details of construction and arrangements of the several parts might be made and substituted for

those shown and described without in the least departing from the nature or spirit of the invention.

Having thus described the invention, what is claimed as new is—

1. The combination with an engine having a smoke-box, of a fan mounted therein and surrounded by a casing, an exterior passage-way communicating with said casing, an exhaust-steam pipe leading to the eye of the fan, and means for conveying the smoke, particles of combustion and gases away from the said fan, substantially as described.

2. The combination with a locomotive-engine having a smoke-box, of a fan located in the front part of said smoke-box and surrounded by a casing, a passage-way exterior of said casing having communication therewith, an exhaust-steam pipe leading to the eye of said fan, a pipe or analogous device for conveying the smoke and particles of combustion back to the fire-box or ash-pan, and an exhaust-pipe for hot air and exhaust-steam, substantially as described.

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

CHARLES HUMPHREY.

Witnesses:

S. J. BAILY,
C. R. BOWEN.