

(No Model.)

2 Sheets—Sheet 1.

D. ANDERSON & J. NAYLOR.

SPARK EXTINGUISHER AND SMOKE CONSUMER.

No. 472,568.

Patented Apr. 12, 1892.

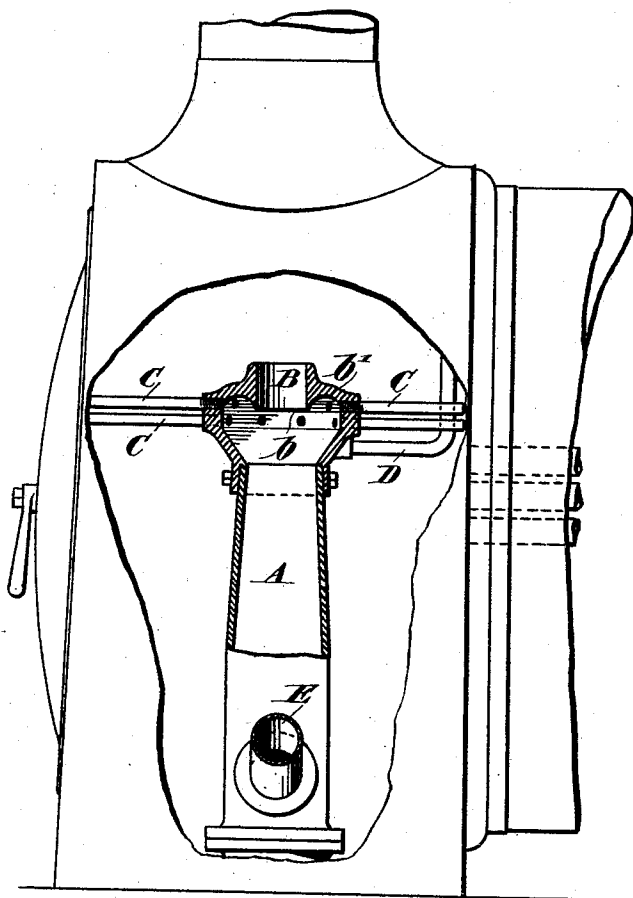


Fig. 1

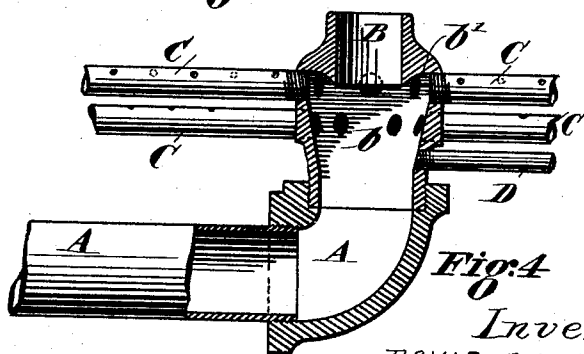


Fig. 4

Witnesses
W. H. Conittland
N. L. Pope.

Inventors
DAVID ANDERSON
JOHN NAYLOR

BY THEIR ATTORNEY

Edward P. Thompson

(No Model.)

2 Sheets—Sheet 2.

D. ANDERSON & J. NAYLOR.
SPARK EXTINGUISHER AND SMOKE CONSUMER.

No. 472,568.

Patented Apr. 12, 1892.

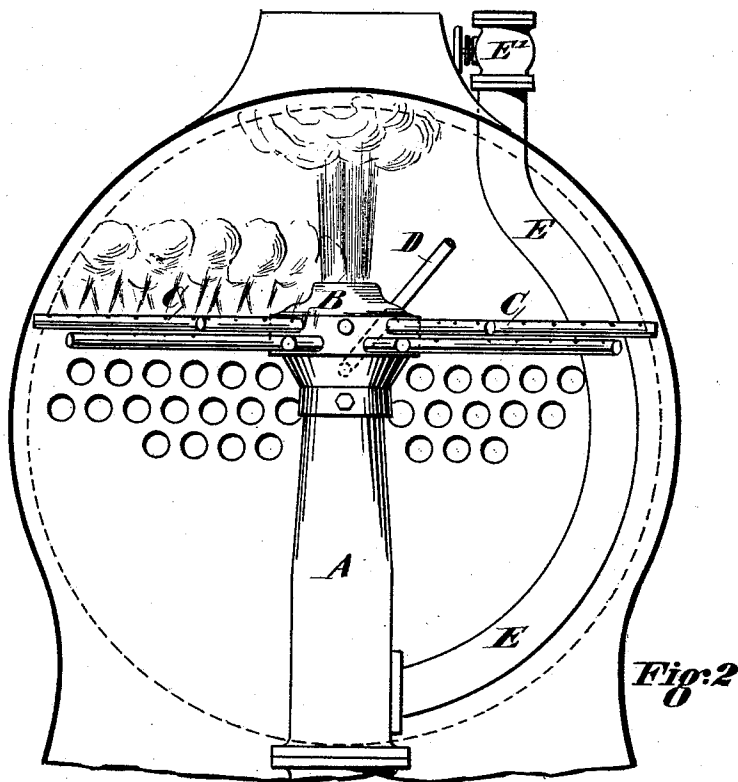


Fig. 2
O

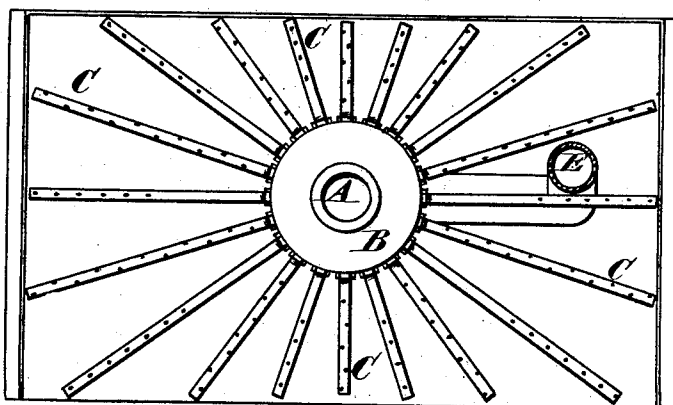


Fig. 3
O

Witnesses

W. H. Conittland
N. L. Rope

Inventors

DAVID ANDERSON
JOHN NAYLOR
BY THEIR ATTORNEY

Edward P. Thompson

UNITED STATES PATENT OFFICE.

DAVID ANDERSON AND JOHN NAYLOR, OF STOWELL, VICTORIA.

SPARK-EXTINGUISHER AND SMOKE-CONSUMER.

SPECIFICATION forming part of Letters Patent No. 472,568, dated April 12, 1892.

Application filed August 13, 1891. Serial No. 402,590. (No model.)

To all whom it may concern:

Be it known that we, DAVID ANDERSON, gentleman, and JOHN NAYLOR, engineer, citizens of the United Kingdom of Great Britain and Ireland, and residents of the town of Stowell, in the British Colony of Victoria, have invented a new and useful invention entitled An Improved Spark-Extinguisher and Smoke-Consumer, of which the following is a specification.

Our invention is arranged in the smoke-box of locomotive or portable engine boilers, or it is arranged in the smoke-box or smoke-chamber of any kind of boiler or furnace where a supply of exhaust-steam, by preference, is obtainable. It is constructed as will be hereinafter explained.

The invention consists in the combination and arrangement, in a smoke-box or smoke-chamber, as above stated, above the flue or tube-line, of a horizontal grating composed of small tubes or tubular bars having fine perforations on their upper surface, from which steam is emitted to extinguish the sparks. These tubes or tubular bars are preferably arranged to radiate from a central exhaust or waste-steam pipe from an engine-cylinder or other source. The perforated tubes or pipes may be arranged otherwise than radial, although we prefer that they are fed from a central exhaust-steam pipe. The nozzle end of exhaust-pipe we make, preferably, in a separate casting, enlarging it in diameter where the ends of perforated tubes or pipes are screwed into it, such enlargement or bore being of such a form as to cause the steam to be led into the ends of tubes; also, to provide a blast when the engine is at rest we connect a small steam-pipe to the nozzle to act as a blower.

To assist in the consumption of smoke in locomotives, we have a branch pipe that springs from near the bottom end of exhaust-pipe in smoke-box and leading out from its top to the atmosphere. Such pipe is furnished with a stop-valve in order that the exhaust through it can be regulated to increase or decrease the blast or current leaving the smoke-box.

In order that our invention may be well understood, we will describe it with reference to the accompanying drawings.

Figure 1 is a side elevation of the front end of a locomotive with a hole broken therein to show the internal construction. Fig. 2 is an end elevation of the device shown in Fig. 1, the end of the locomotive being broken away, so as to show the elements of our invention. Fig. 3 is a portion of Fig. 2 in plan. Fig. 4 is a view, partly in section, of a detail of construction.

Figs. 1, 2, and 3 show how we adapt our invention to the smoke-box of a locomotive-engine, A being the exhaust or blast pipe, and B its nozzle or upper end, secured in position, as shown. C are tubes or pipes screwed into holes in nozzle and having their upper surface perforated and their outer ends closed. Nozzle B has a downwardly-projecting lip *b*, that forms the inner rim of an annular channel *b'* to lead the steam into the pipes or tubes C. D is the blower-pipe for feeding exhaust-pipe with steam when the engine is at rest. E is the branch pipe leading from exhaust, and E' its stop-valve.

Fig. 4 shows the form of nozzle we employ in the smoke-box of a portable engine or other smoke box or chamber when a vertical exhaust-pipe is not standing therein, A being the exhaust, B the nozzle, *b* its inner lip, and *b'* annular channel, C perforated tubes, and D the blower-pipe.

The mode of operation of our invention is as follows: The unconsumed particles of fuel or sparks enter the smoke-box under our perforated tubular grating and then ascend by reason of the draft, when before reaching the funnel they have to pass through the upwardly-sprayed steam-mist issuing from perforations of pipes C, and consequently sparks are immediately extinguished; also, in locomotives by employing a branch exhaust-pipe E when the engine is worked with a high pressure of steam and the exhaust therefrom produces a blast that is too powerful to allow the smaller particles of fuel to be thoroughly consumed before leaving the tubes and smoke-box then at such times the valve E' is opened to the desired extent to allow a portion of exhaust-steam to escape without passing through exhaust-pipe A of smoke-box, and thus the draft therein is lessened.

What we claim as our invention, and desire to secure by Letters Patent, is—

Exhaust-nozzle B, having within it lip *b* and annular channel *b'*, in combination with perforated tubes C, screwed into and radiating from it, and preferably with blower-pipe
5 D, all substantially as and for the purposes set forth, and arranged as illustrated in our drawings.

In testimony that we claim the foregoing as our invention we have signed our names, in

presence of two witnesses, this 16th day of 10 June, A. D. 1891.

DAVID ANDERSON.
JOHN NAYLOR.

Witnesses:

JAS. HINGSTON,
Notary Public, Melbourne.
BEDLINGTON BODYCOMB,
Patent Agent, Melbourne.