No. 749,314. PATENTED JAN. 12, 1904.

T. MILLS.

STEAM BOILER ATTACHMENT.

APPLICATION FILED JUNE 17, 1903.

NO MODEL.

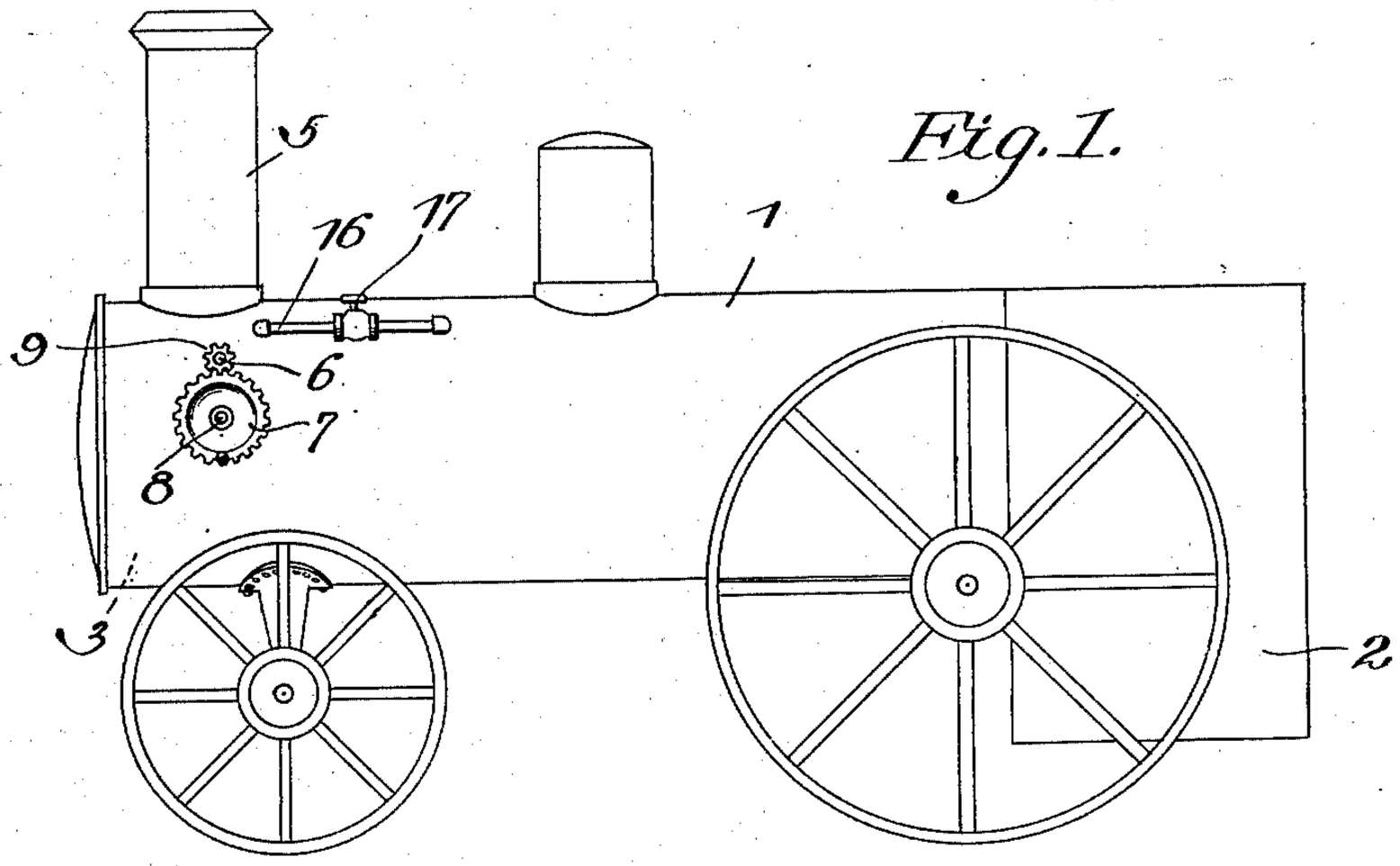

Fig. 1.

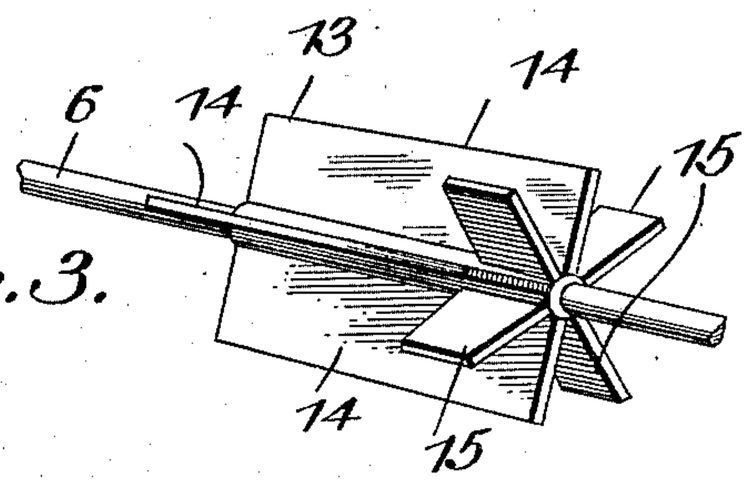

Fig. 3.

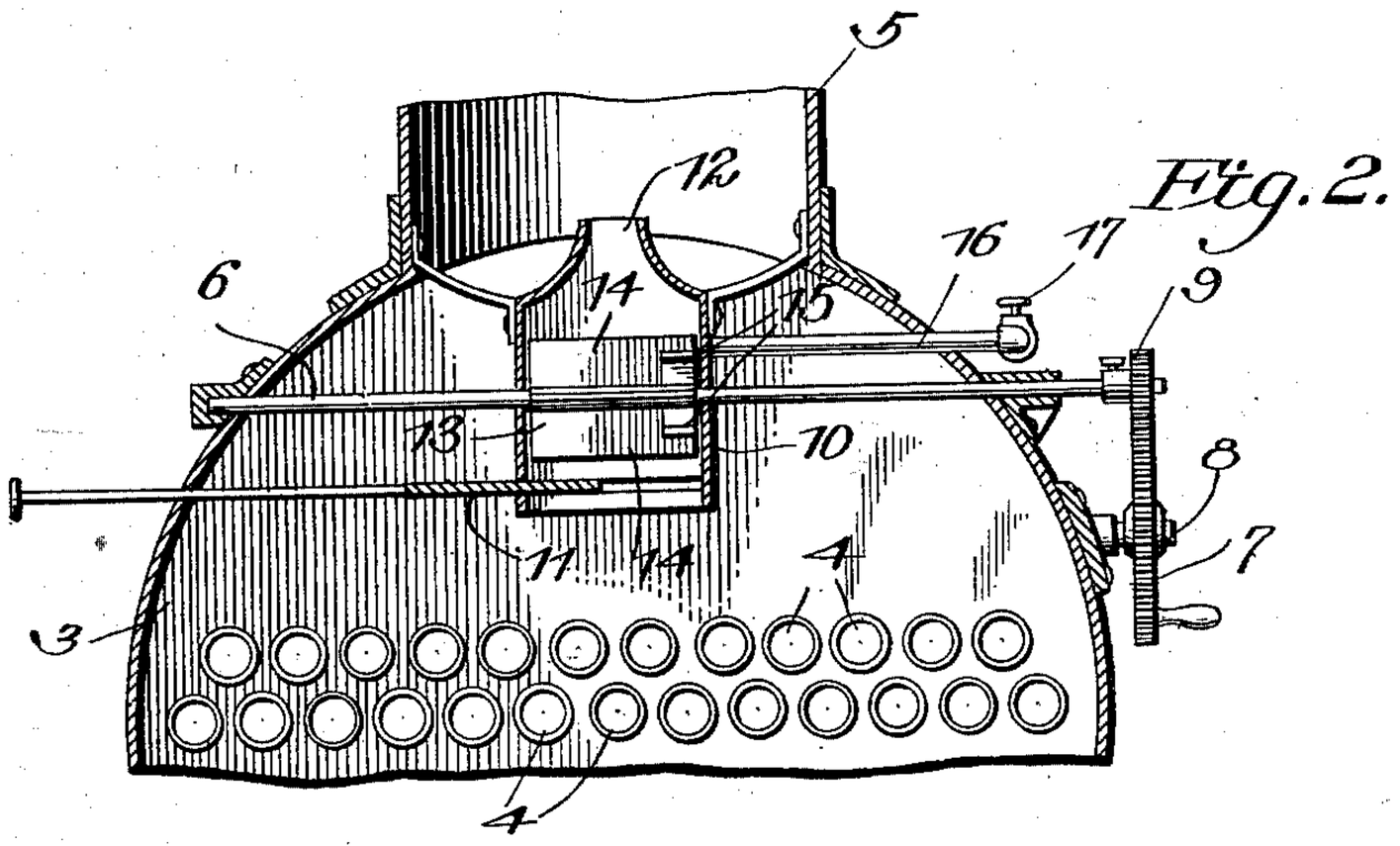

Fig. 2.

Witnesses
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No. 749,314. Patented January 12, 1904.

UNITED STATES PATENT OFFICE.

THOMAS MILLS, OF OKLAHOMA, OKLAHOMA TERRITORY, ASSIGNOR OF ONE-HALF TO ROBERT D. STETSON, OF OKLAHOMA, OKLAHOMA TERRITORY.

STEAM-BOILER ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 749,314, dated January 12, 1904.

Application filed June 17, 1903. Serial No. 161,947. (No model.)

To all whom it may concern:

Be it known that I, THOMAS MILLS, a citizen of the United States, residing at Oklahoma city, in the county of Oklahoma, Oklahoma Territory, have invented a new and useful Improvement in Steam-Boiler Attachments, of which the following is a specification.

My invention relates to steam-boilers, and is especially directed to an attachment whereby a forced draft is obtained while firing the boiler-furnace and which is thereafter maintained for assisting combustion and freeing the boiler-tubes of lodgment of cinders and ashes therein, and has for its objects to produce a device of this character which will be simple of construction, efficient in operation, one which may be readily applied to the boiler, and one in which the draft-fan may be manipulated by hand initially and thereafter driven by steam from the boiler.

To these ends the invention comprises the novel details of construction and combination of parts more fully hereinafter described.

In the accompanying drawings, Figure 1 is a side elevation of a boiler having my attachment applied thereto. Fig. 2 is a vertical transverse section on the line 2 2 of Fig. 1. Fig. 3 is a detail perspective view of the fan removed.

Referring to the drawings, 1 indicates a boiler of the horizontal type, having a fire-chamber 2, a smoke-chamber 3, tubes 4 connecting said chambers, and through which the heat and products of combustion pass off from the fire-chamber as usual, and a smoke-stack 5. These parts are all of the ordinary construction and may be of any suitable material, inasmuch as they constitute no part of my invention.

In accordance with my invention I extend transversely through the smoke-chamber 3 a horizontal shaft 6, having bearings in the walls of the chamber. This shaft, which is rotary, is driven through the medium of a manually-operated spur-gear 7, journaled upon a stud 8, attached to the outer side wall of the boiler, in mesh with a spur-pinion 9, fixed in any suitable manner to the adjacent end of the shaft.

10 is a casing disposed within the smoke-chamber 3 between the discharge end of tubes 4 and the lower end of stack 5. This casing, which is suspended by suitable brackets from the top of the chamber, has an intake-opening disposed toward the tubes 4 and adapted to be closed when desired by a sliding door 11 and a discharge-opening 12, disposed toward and delivering into the lower end of stack 5.

The shaft 6 extends through the walls of casing 10 and has fixed thereon within the casing a fan 13, composed of primary blades 14, of a length equal to the width of the casing, and short secondary blades 15, which are arranged between the blades 14 and are disposed, preferably, at one end thereof. There are by preference four of the primary blades 14, arranged in pairs diametrically disposed, and a like number of the secondary blades arranged one between each pair of primary blades.

16 indicates a steam-pipe which communicates with the steam-space of the boiler and has its forward discharge end situated within the smoke-chamber 3 in position to deliver a jet of steam upon the blades of fan 13 within the path of the secondary blades 15 for driving the fan. The pipe 16 is provided with a suitable valve 17, operable for controlling or entirely cutting off the passage of steam through the pipe.

In practice when it is desired to fire the boiler-furnace the gear 7 is manually operated, which, through the medium of pinion 9, rotates shaft 6 and drives fan 13 for inducing a forced draft through the tubes 4 and outward through the stack, thus greatly expediting the work of firing and the raising of steam in the boiler. After sufficient steam has generated in the boiler the pinion 9, which is preferably fixed to the shaft by a set-screw or the like, is released and moved longitudinally of the shaft out of engagement with the gear 7, and the valve 17 is opened to admit steam through pipe 16 for impinging upon and driving the fan, as above explained, thus materially assisting combustion in the fire-chamber and at the same time, owing to the strong draft

through the tubes 4, preventing lodgment therein of the products of combustion. When it is desired to entirely stop the operation of fan 13, not only is the pinion 9 moved out of engagement with its driving-gear, but the valve 17 is also closed. Under these conditions it is desirable to close door 11 to prevent the passage of the products of combustion through and their lodgment within the fan-case.

From the foregoing it will be seen that I produce a device of simple construction which will be efficient in operation and one which may be readily applied to boilers during manufacture or to those now in use and one which in practice will admirably perform its functions. In attaining these ends I do not limit myself to the precise details herein shown and described, inasmuch as minor changes in the form, proportion, and manner of assemblage of the parts may be resorted to without departing from the spirit or scope of my invention.

It is to be noted that the device is of especial importance for maintaining the draft in traction-engines should the stack of the latter become accidentally broken at a point near its base, as sometimes occurs when passing beneath trees or the like. The device is also of especial advantage for use with engines having the stacks jointed at the base and adapted to be laid down for passage beneath obstructions.

Having thus described my invention, what I claim is—

1. The combination with a boiler having a fire-chamber, a smoke-chamber and connecting-tubes, of a smoke-stack disposed over the smoke-chamber, a rotary fan situated in the smoke-chamber and operable for inducing a forced draft through the tubes, manually-operable means for rotating the fan, and a steam-pipe communicating with the boiler steam-space and disposed for directing a jet of steam upon the fan-blades to actuate the fan.

2. The combination with a boiler having a fire-chamber, a smoke-chamber and connecting-tubes, of a smoke-stack disposed over the smoke-chamber, a rotary fan situated in the smoke-chamber and operable for inducing a forced draft through the tubes, said fan having a plurality of primary blades and a plurality of short secondary blades arranged between the primary blades, manually-operable means for rotating the fan, and a steam-pipe communicating with the boiler steam-space and disposed for directing a jet of steam upon the fan in the path of its secondary blades to actuate the fan.

3. The combination with a boiler having a fire-chamber, a smoke-chamber and connecting-tubes, of a smoke-stack disposed over the smoke-chamber, a casing situated within the smoke-chamber and having an intake-opening disposed toward the tubes and a discharge-opening disposed toward the stack, a door operable for closing the intake-opening, a rotary fan situated in the casing and operable for inducing a forced draft through the tubes, said fan having a plurality of primary blades and a plurality of secondary blades arranged between the primary blades, manually-operable means for rotating the fan, and a steam-pipe communicating with the boiler steam-space and disposed for directing a jet of steam upon the fan in the path of its secondary blades to actuate the same.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

THOMAS MILLS.

Witnesses:

LEDAN GUTHRIE,

J. H. MARSHALL.