

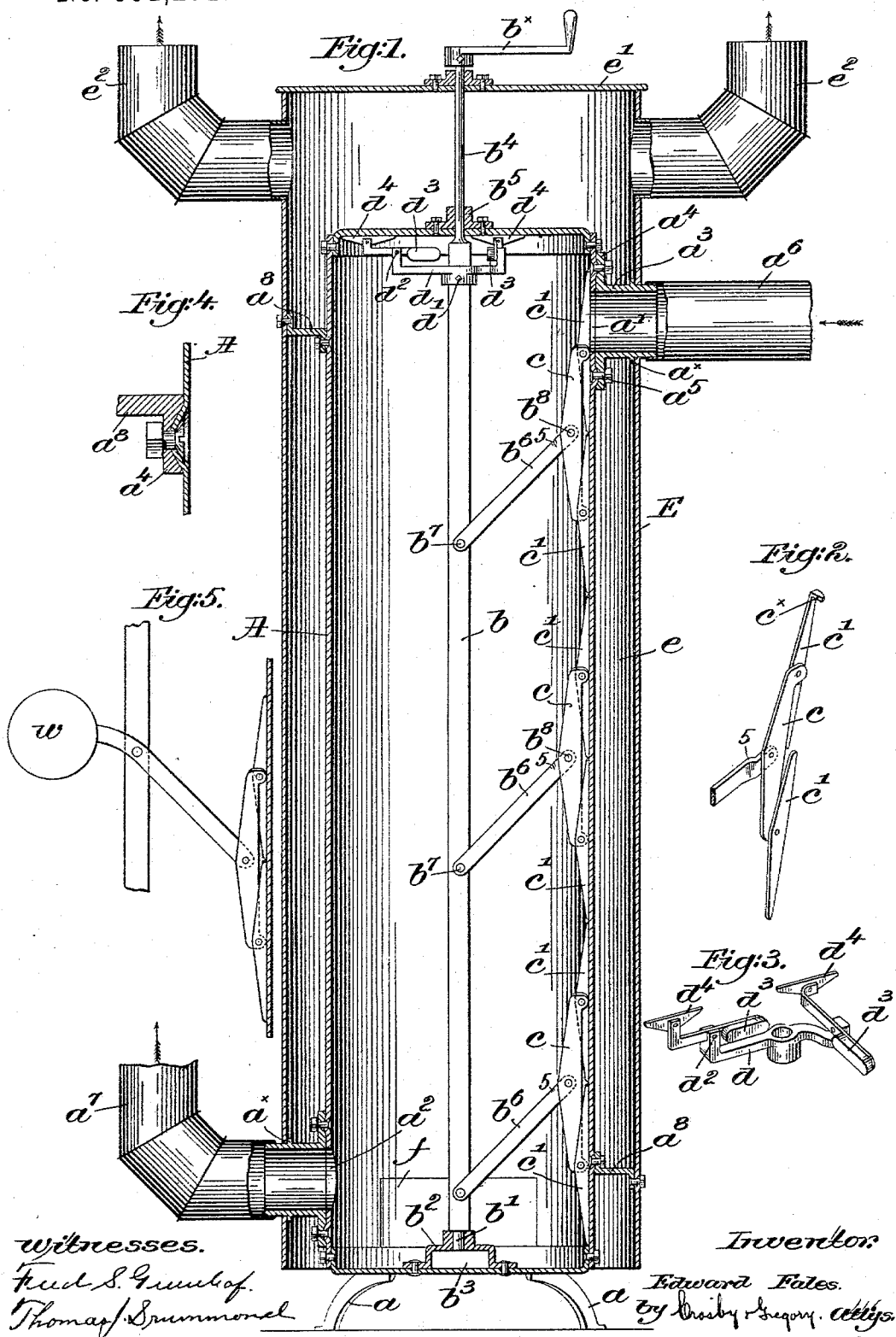
(No Model.)

E. FALES.

SOOT REMOVING DEVICE FOR HEATING DRUMS.

No. 551,271.

Patented Dec. 10, 1895.



UNITED STATES PATENT OFFICE.

EDWARD FALES, OF WINTHROP, MASSACHUSETTS.

SOOT-REMOVING DEVICE FOR HEATING-DRUMS.

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To all whom it may concern:

Be it known that I, EDWARD FALES, of Winthrop, county of Suffolk, State of Massachusetts, have invented an Improvement in Soot-Removing Devices for Heating-Drums, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

Prior to this invention it has been common to lead the smoke-funnel of a wood-burning stove to a sheet-iron heating-drum and an outlet-pipe from the drum to the chimney, to thereby cause the smoke from the stove or heater to pass through the drum on its way to the chimney, in order that much of the heat, usually from seventy-five to eighty-five per cent. of all produced in the stove, which ordinarily passes to the chimney unutilized, may, through the medium of the heating-drum, be employed for heating purposes. Attempts to utilize drums of this class in connection with coal-burning heaters have, so far as I am aware, proved impracticable, owing to the rapidity with which soot from the products of combustion or smoke collects upon the inner surface of the heating-drum, and being a non-conductor of the heat prevents ready radiation of the heat from the interior of the drum to the air in contact with the exterior.

This invention has for its object the production of a novel device to be used in connection with heating-drums of the class referred to, and by means of which the soot or other substances which may collect upon the interior of the drum may be readily removed at any time, in order to keep the inner surface of the drum always clean and in such condition as to readily conduct the heat to the outside.

In accordance with my invention, I provide a rotatable shaft or, as I shall hereinafter call it, an "actuator," extended preferably through the heating-drum, and provided with one or more scrapers adapted to act upon the inner surface of the drum, and upon rotation of the actuator to scrape the said inner surface clean. These scrapers are preferably pivoted or otherwise loosely mounted upon the free ends of carrying-arms, pivoted or loosely connected to the actuator, in order that the

said carrying-arms and scrapers may readily adjust themselves to inequalities or unevenness in the surface in contact with which they are moved. Suitable scrapers are also provided to act upon and clean the end or ends of the drum.

In practice the drum will be provided at its bottom with a suitable cleaning-opening, closed by a door, by means of which the soot or other substance or substances which may collect within the drum can be removed.

In the preferred construction the drum is surrounded by an inclosing shell or jacket separated from the drum to leave an air-space through which air may rise in contact with the heated surface of the drum and be radiated from the upper end of the said jacket into the room or be conducted through suitable pipes to adjacent rooms as may be desired.

My invention further comprehends various details of construction to be hereinafter fully described and pointed out in the claims.

In the drawings, Figure 1, in vertical section, illustrates one embodiment of my invention; Fig. 2, a perspective detail showing the manner of mounting the scrapers shown in Fig. 1; Fig. 3, a detail showing in perspective the manner of mounting the end scrapers in Fig. 1; Fig. 4, an enlarged sectional detail illustrating my improved means for sinking the bolt-heads below the interior surface of the drum, and Fig. 5 a detail illustrating a modification of one part of my invention.

Referring to the drawings, in the embodiment of my invention there shown to enable the same to be understood, the heating-drum A is shown as cylindrical in form, preferably built up in suitable manner from sheet-iron, the same being preferably mounted upon suitable feet *a a*, which raise it a short distance above the floor.

Within the drum A, I have shown an actuator *b*, shown as a rectangular flat bar provided at its lower end with a suitable journal *b'*, supported in a suitable bearing in the step *b²* riveted or otherwise suitably attached to the bottom of the drum in such manner as to leave a free cleaning-space *b³* beneath the bearing into which soot and the like may drop, to keep the bearing always clean. The actuator *b* at its upper end is rounded as shown to provide a journal *b⁴*, which has its principal

bearing in a cap b^5 riveted or otherwise suitably attached to the upper end of the drum.

I have herein shown suitable carrying-arms b^6 pivoted or otherwise loosely attached at their ends b^7 to the actuator b , and at their free ends carrying one or more scrapers, the said carrying-arms in the present instance of my invention being jointed at their outer ends at b^8 to the centers of suitable yokes c , which latter in turn have pivoted to their ends, and as herein shown, at opposite sides scrapers c' c' , the adjacent ends of the scrapers c' at opposite sides the yoke c preferably overlapping in order that the entire interior surface of the drum may be thoroughly scraped. As many of these carrying-arms b^6 with their scrapers may be provided as is necessary to fully cover the interior surface of the drum, and it is evident that the more scrapers attached to any single carrying-arm the fewer carrying-arms will be required, and while I have herein shown each carrying-arm as provided with two scrapers, the number of scrapers upon any carrying-arm may be varied as desired, I preferring to employ a series of short scrapers rather than long ones, in order that they may better conform to any irregularities in the surface of the drum.

It will be noticed that the carrying-arms stand in an angular position, in order that the weight of the arms together with the attached yokes and scrapers may keep the latter always in operative contact with the interior of the drum, and the angular position of the carrying-arm permits the scrapers to move toward and from the axis of rotation, as may be necessary to accommodate inequalities in the surface of the drum. It is evident that with the carrying-arms and scrapers mounted in this manner the interior of a non-circular drum may be cleaned, for the carrying-arm is free to rise or fall as necessary to meet the varying curvature of the drum.

To scrape the inner side of the top of the drum, I have herein provided an arm d , suitably connected to the actuator, as by a set-screw d' , and herein shown as having at its ends at opposite sides the actuator turned upwardly to provide pivots at d^2 for the carrying levers d^3 having one of their ends weighted and having pivoted to their opposite ends the scrapers d^4 . As herein shown, one of the scrapers d^4 scrapes the portion of the top from the middle part outwardly and the other from the middle to the axis, it being evident, however, that these top scrapers may be otherwise arranged and their number increased or diminished as desired.

The smoke-inlet is shown at a' and the outlet at a^2 , the former being preferably near the top or inner end of the drum and the latter at or near the bottom of the opposite end of the drum, the said inlet and outlet in the present instance being each surrounded by a suitable cast-iron or other suitable collar a^3 provided with a base-flange a^4 fitting the ex-

terior of the drum and bolted thereto by suitable bolts a^5 .

Referring particularly to Fig. 4, the bolt-holes in the flange a^4 of the collar are countersunk at the inner face of the flange adjacent the material of the drum, in order that tightening of the bolt may act through the bolt-head to draw the metal of the drum into the countersink, and thereby sink the bolt-head below or flush with the inner surface of the drum to leave the latter free from any possible obstruction to interfere with the proper rotative movement of the scrapers. The smoke-pipe a^6 leading from the stove or heating apparatus is connected to the collar at the inlet a' and a suitable pipe a^7 leading to the chimney is connected to the collar at the outlet a^2 .

Surrounding the drum A, I have herein shown and prefer to use a shell or jacket E separated from the drum to leave an air-space e open at its bottom, through which air may rise in contact with and to be heated by the walls of the drum.

In the present instance of my invention the jacket E is provided with a top e' arranged a sufficient distance above the top of the drum to leave a hot-air chamber, from which may lead the hot-air exit-pipes e^2 to convey the heat to adjoining rooms, or the exit-pipes e^2 may be omitted and the heated air permitted to pass directly into the room in which the drum is placed.

The outer jacket E, as herein shown, is supported upon the collars a^3 , and retained in position thereon by ring-like flanges a^x on the said collars, and at the sides of the drum opposite the collars by suitable brackets or struts a^8 .

The actuator b has its top journal b^4 shown extended through the top of the exterior or inclosing shell or jacket, and is there provided with a handle or crank b^x by which the said actuator may be rotated to cause the scrapers to sweep around in contact with the inner surface of the drum to remove therefrom all soot or foreign matter which may have adhered thereto. The soot or foreign matter removed drops to the bottom of the drum, from which it may be removed through a suitable opening closed by a door shown at f , there being a corresponding door (not shown) in the outer jacket.

The drum A will in practice be preferably made from sheet-iron, and therefore necessarily provided with a longitudinal seam at some point. In order that the scrapers may readily pass this seam, or in fact any seam or projection which may be found in the drum, I prefer to twist the carrying-arms b^6 slightly, as shown at 5, Fig. 2, in order that the scrapers may stand at an angle, whereby one end of the scraper first meets the seam or obstruction and mounts the same, making it easier for the remainder of the scrapers to follow. I have also shown the leading end of the scraper as turned at right angles, as shown

at c^x , Fig. 2, with its surface adjacent the wall of the drum curved to further assist in mounting any seam or projection.

I have found the construction of the several parts as shown in the drawings to produce excellent results, but my invention is not necessarily limited to such, for it may be varied in many ways without departing from the spirit and scope of my invention.

10 The actuator may be rotated in various ways, as found most convenient, and the outer inclosing shell or jacket E may be changed and used or not, as desired.

15 In Fig. 1 the carrying-arms b^6 stand in an upwardly-inclined position, but in Fig. 5 I have shown the same as in a downwardly-inclined position, and in the construction Fig. 5 have provided a weight w to maintain the scrapers in operative contact with the surface 20 of the drum.

I claim—

1. The combination, with a heating-drum, of an actuator and one or more scrapers loosely connected thereto and adapted to clean the 25 inner surface of the drum, the loose connection of the scrapers to the actuator enabling the former to more or less adapt themselves to inequalities in the drum surface, substantially as specified.

30 2. The combination with a heating drum, of a rotatable actuator, and one or more scrapers loosely connected thereto and adapted on rotation of the actuator to clean the inner surface of the drum, the loose connection of the 35 scrapers to the actuator enabling the former to more or less adapt themselves to inequalities in the drum surface, substantially as described.

40 3. The combination with a heating drum, of a rotatable actuator, one or more carrying arms loosely connected therewith, and one or more scrapers loosely connected to the other ends of the said carrying arms and thereby capable of adjusting themselves to irregularities in the inner surface of the drum during 45 their rotation by said actuator, substantially as described.

50 4. The combination with a heating drum, of a rotatable actuator, one or more carrying arms loosely connected thereto and standing

at an angle, and one or more scrapers loosely connected to the free ends of said carrying arms, the weight of the carrying arms and scrapers serving to keep the latter in operative contact with and to clean the inner surface 55 of the drum, the angularity of the carrying arms enabling them to adapt themselves to the surface to be cleaned, substantially as described.

5. The combination with a heating drum, 60 of a rotatable actuator, one or more carrying arms mounted thereon, and a scraper or scrapers connected to the free end of each of said carrying arms, the said scrapers having one of their ends arranged slightly in advance 65 of the other, to enable them to better pass obstacles in the path of movement, substantially as described.

6. The combination with a heating drum, of a rotatable actuator and side and end scrapers carried thereby to act upon and clean the 70 inner side and end surface of the said drum, substantially as described.

7. The combination with a heating drum, of a rotatable actuator, an arm, as d , mounted 75 thereon, a carrying lever pivoted to said arm, and an end scraper pivoted to said carrying lever, substantially as described.

8. The combination with a heating drum, of a rotatable actuator, one or more carrying 80 arms pivoted thereto, yokes pivoted to the free ends of the said carrying arms, and scrapers pivoted to opposite ends of said yokes, substantially as described.

9. The combination with a substantially 85 cylindrical drum provided at or near its bottom with an inlet located at one side the axis of the drum, of a raised step bearing on the drum bottom, a suitable bearing at the top of the drum, and a scraper actuator journaled 90 in said bearings, to operate, substantially as described.

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

EDWARD FALES.

Witnesses:

FREDERICK L. EMERY,
EMMA J. BENNETT.