E. B. BARNHILL.

FLUE CLEANER.

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913,675.

Patented Feb. 23, 1909.

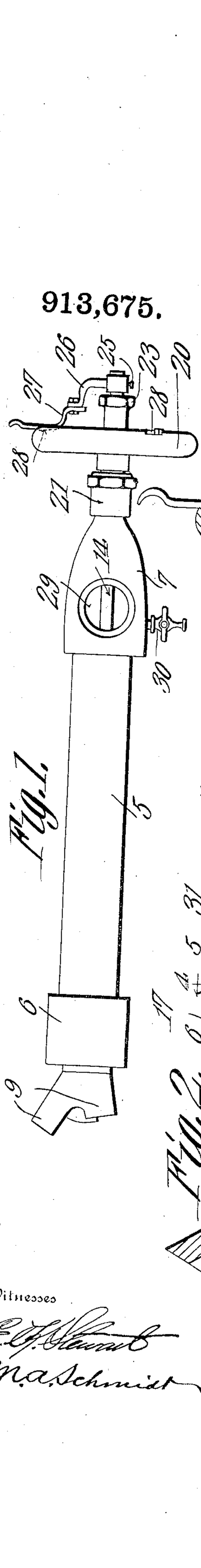

Fig. 1.

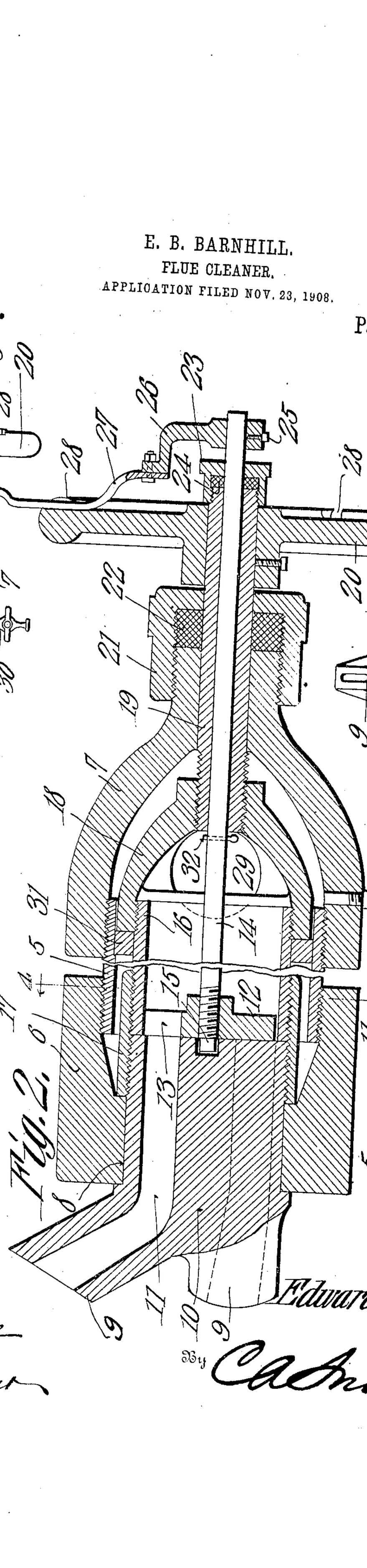

Fig. 2.

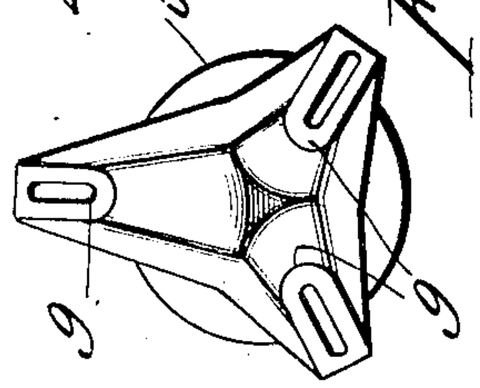

Fig. 3.

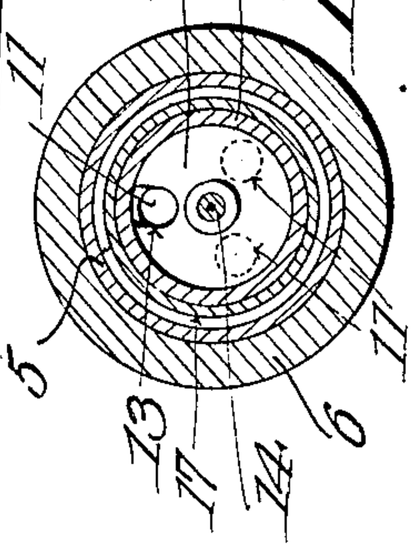

Fig. 4.

Witnesses

E. J. Stewart

M. A. Schmidt

Inventor

Edward B. Barnhill.

By C. A. Snow & Co.

Attorneys

UNITED STATES PATENT OFFICE.

EDWARD B. BARNHILL, OF MARION, INDIANA, ASSIGNOR OF ONE-HALF TO MARION MACHINE, FOUNDRY & SUPPLY COMPANY, OF MARION, INDIANA, A CORPORATION.

FLUE-CLEANER.

No. 913,675. Specification of Letters Patent. Patented Feb. 23, 1909.

Application filed November 23, 1908. Serial No. 464,067.

To all whom it may concern:

Be it known that I, EDWARD B. BARNHILL, a citizen of the United States, residing at Marion, in the county of Grant and State of Indiana, have invented a new and useful Flue-Cleaner, of which the following is a specification.

This invention relates to a device for removing accumulations of soot, dirt, etc., from boiler flues by a blast of steam. Such devices are provided with a nozzle for directing blasts to the flues, and the present invention relates more particularly to such a nozzle, its object being to provide a nozzle which is simple in structure, and inexpensive to manufacture.

A further object of the invention is to provide improved means for operating and adjusting the nozzle so that each and every flue may be reached, thus assuring a thorough cleaning of the boiler.

The invention also has for its object to provide a cleaner of this kind which is economical in its use of steam.

In the accompanying drawings: Figure 1 is an elevation of the invention. Fig. 2 is an enlarged longitudinal sectional view. Fig. 3 is an end view. Fig. 4 is a transverse section on the line 4—4 of Fig. 2 drawn to a reduced scale.

In the drawings 5 denotes a tube which is open at both ends, and screw-threaded exteriorly to receive caps 6 and 7, respectively. The cap 6 has a bore 8 in which is mounted a series of nozzles 9 projecting from a body portion 10 rotatably fitting in said bore. Three nozzles are shown, and they are inclined with respect to the axis of the device, so that the blasts will be deflected laterally. The bores of the nozzles communicate with steam ports 11 in the body portion 10, and on the inner end of the latter is seated a valve for controlling said ports. This valve is in the shape of a disk 12 having in its periphery a notch or recess 13 which is adapted to be brought into alinement with any of the ports 11, whereby the nozzles may be successively brought into play, when the disk is rotated. The valve is operated by a stem 14 secured thereto, and extending therethrough and a short distance from the face of the valve disk and seating in a recess made in the inner face of the part 10, whereby said disk is centered on its seat.

Inside the tube 5, and spaced therefrom, is located a tube 16 which is open at its ends, and is connected at one end to the part 10, by means of a coupling sleeve 15. To the other end of the tube 16 is screwed or otherwise secured a cross-head 18 into the outer end of which is screwed a tubular stem 19 through which the valve stem 14 extends. The stem 19 projects from the head 7 and has its projecting end fitted with a hand wheel 20. The head 7 is provided with the packing nut 21 through which the stem 19 passes, and around which, within the nut, a suitable packing 22 is placed. The stem 19 projects beyond the hand wheel 20, and is also provided with a packing nut 23 through which the valve stem 14 extends, a suitable packing 24 being placed around said stem inside the packing nut 23. The valve stem 14 projects a short distance beyond the packing nut 23, and on said projecting end is secured by means of a set-screw 25, or other suitable means, a laterally projecting arm 26, having secured to its outer end, a flat spring 27 which is engageable with notches 28 made in the rim of the hand wheel 20, for a purpose to be presently described. The head 7 has inlets 29 and is also fitted with a drip cock 30. The steam passes from the inlets past the cross-head 18, into the tube 16, and then to the nozzle for which the valve is set. Between the tubes 5 and 16 is interposed a packing ring 31 to prevent entry of steam therebetween. The valve stem 14 carries a transverse pin 32 which is engageable with the inner end of the stem 19 whereby the valve is prevented from being pulled off its seat.

The construction herein described permits the nozzles to be rotated by the hand wheel 20, and the valve controlling the ports to said nozzles, is operated by the arm 26 on the valve stem 14. Upon rotating the hand wheel, a circle of flues within the range of the nozzle which is discharging is closed. To bring the next nozzle into play, the spring 27 is raised out of the notch 28, and the valve stem is turned until said spring enters the next notch. This brings the notch 13 of the valve disk in line with the port of the next nozzle, after which the hand wheel is again rotated to blow the next circle of flues within the radius of said nozzle, and so on until all the flues are cleaned. The hand wheel is turned one or more times to each nozzle according to the amount of soot and

dirt in the flues. The valve turns with the nozzle, by reason of the engagement of the ring 27 with the notches 28 of the hand wheel, in order that the nozzle which happens to be discharging may remain open when it is rotated by the hand wheel as described.

The device herein described is economical in its use of steam, and the steam is not wasted by spreading it over a large area. Each nozzle takes care of a limited number of flues, and directs the steam squarely thereto without any waste of its energy.

Although I have shown and described three nozzles, it will be understood, that their number may be varied, and minor changes not involving a departure from the inventive idea may also be resorted to.

The device will be suitably located in the rear wall of the boiler furnace, the hand wheel 20, and the part 26 and its associated parts being on the outside thereof. Steam is supplied to the inlets 29 by a suitable valved connection with the boiler.

What is claimed is:

1. A boiler flue cleaner comprising a casing having a steam inlet, a plurality of rotatable nozzles carried by the casing, and having inlet ports communicating therewith, and a valve controlling said ports successively.

2. A boiler flue cleaner comprising a casing having a steam inlet, a plurality of rotatable nozzles carried by the casing and having inlet ports communicating therewith, a valve controlling said ports successively, means for operating the valve, means for rotating the nozzles, and means for coupling the valve and the nozzle-operating means.

3. A boiler flue cleaner comprising a casing having a steam inlet, a plurality of rotatable nozzles carried by the casing, and having inlet ports communicating therewith, a tubular stem connected to the nozzles, and extending to the outside of the casing, a notched hand wheel on said stem, a valve controlling the nozzle ports successively, a stem connected to the valve, and extending through the aforesaid tubular stem, and a member carried by the valve stem, and engageable with the notches of the hand wheel.

4. A boiler flue cleaner comprising a casing having a steam inlet, a plurality of rotatable nozzles carried by the casing and having inlet ports communicating therewith, a valve controlling said ports, said valve comprising a disk having a peripheral notch adapted to successively register with said ports, means for operating said valve, and means for rotating the nozzles.

5. A boiler flue cleaner comprising a casing having a steam inlet, a plurality of rotatable nozzles carried by the casing, and having inlet ports communicating therewith, a tube coupled to the nozzles, a cross-head connected to the tube, a tubular stem connected to the cross-head and extending to the outside of the casing, a notched hand wheel on said tubular stem, a valve controlling the nozzle ports successively, an operating stem connected to the valve, and extending through the aforesaid tubular stem, and a member carried by the valve stem and engaging with the notches of the hand wheel.

6. In a boiler flue cleaner a plurality of rotatable nozzles, and means for bringing said nozzles into play successively said means rotating with the nozzle.

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

EDWARD B. BARNHILL.

Witnesses:
CHAS. M. SULLIVAN,
JOHN C. PIGDIN.