

No. 647,132.

Patented Apr. 10, 1900.

C. S. DEAN.

COMBINED FIRE STOP AND SCRAPER FOR BOILER FLUES.

(Application filed July 22, 1899.)

(No Model.)

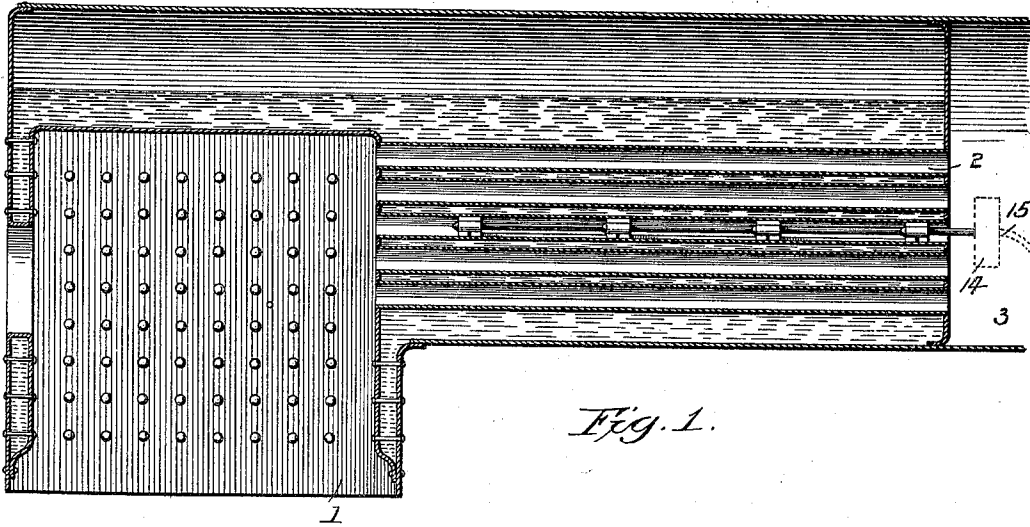


Fig. 1.

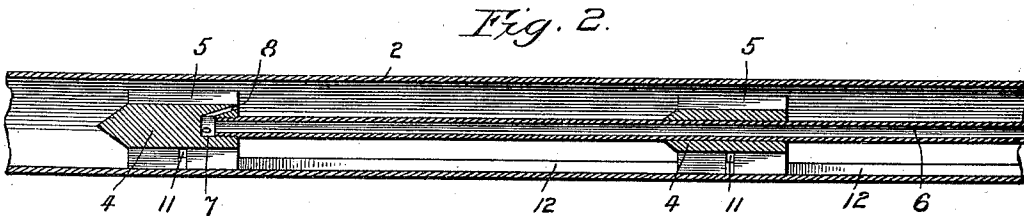


Fig. 2.

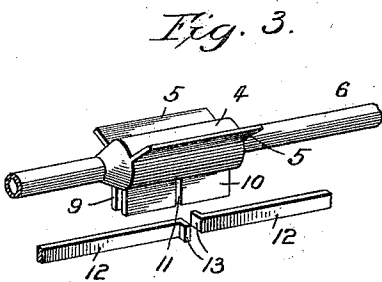


Fig. 3.

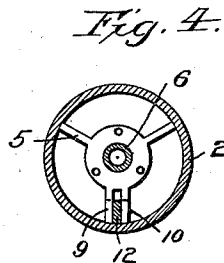


Fig. 4.

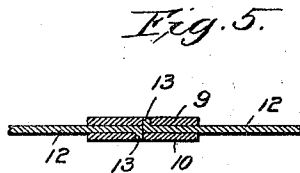


Fig. 5.

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# UNITED STATES PATENT OFFICE.

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## COMBINED FIRE-STOP AND SCRAPER FOR BOILER-FLUES.

SPECIFICATION forming part of Letters Patent No. 647,132, dated April 10, 1900.

Application filed July 22, 1899. Serial No. 724,775. (No model.)

*To all whom it may concern:*

Be it known that I, CYRUS S. DEAN, a subject of the Queen of Great Britain, residing at Fort Erie, county of Welland, Province of Ontario, Dominion of Canada, have invented certain new and useful Improvements in a Combined Fire-Stop and Scraper for Boiler-Flues, of which the following is a specification.

This invention relates to combined fire-stops and scrapers for boiler-flues, and is an improvement on the devices set forth in my United States Letters Patent No. 172,302, granted January 18, 1876, and No. 215,583, granted May 20, 1879.

The fire-stops and the connecting-pipe of the present invention have substantially the same construction and functions as those set forth in my previous patent, No. 172,302, but are adapted for rotation by a suitable motor, and my present object is to provide improved scrapers or cleaners not used solely for the purpose of connecting the fire-stops together, as do the rods of my former patent, No. 215,583, but attached to the wings of the stops in a novel manner, so as to be adapted to fly out by centrifugal force when the device is rotating and effectually remove the incrustation on the interior of the flue, thereby rendering cleaning of the flue an easy matter while the flame is playing therethrough and being equalized in its action by the fire-stops, thus insuring the highest possible efficiency in the boiler.

The foregoing object is accomplished by the provision of a central pipe, to which the fire-stops are secured at suitable distances apart, and which is adapted for rotation in the flue by a suitable motor, together with wings of improved construction on the stops and scrapers of novel form and arrangement having loose connections with the wings, which permit them to fly outward against the interior of the flue when the pipe and stops are rotated.

As in my previous patent, No. 172,302, the present invention comprehends the employment of discharge-apertures, from which steam can be blown from the pipe to eliminate the incrustation from the flue as fast as it is loosened.

In the accompanying drawings, Figure 1 is a longitudinal section of a horizontal fire-tube boiler, showing the invention in one of the flues; Fig. 2, a longitudinal section showing the invention in detail; Fig. 3, a detail perspective of one of the fire-stops and the ends of two scrapers in position for attachment thereto; Fig. 4, a detail cross-section taken through a flue and in front of one of the fire-stops, and Fig. 5 a longitudinal section taken through the double wing on the fire-stop and the ends of the scrapers.

In the boiler illustrated, 1 is the fire-box, 2 the flues, and 3 the smoke-box. The fire-stops 4 have wings 5, which keep them in proper position in the flue, and are provided with conical ends, as in my former patent. A central pipe 6 is employed, on which the stops are suitably secured, the end stop receiving the threaded end of the pipe and having a small chamber 7, from which extend inclined steam-discharge apertures or outlets 8. This construction has the advantages over my Patent No. 172,302 of obviating the necessity of boring the pipe and of insuring the proper direction of the steam-pressure to blow out the incrustation as fast as removed from the flue. One of the wings is made in two parallel parts 9 and 10, having slots 11 intermediate their ends. I employ scrapers 12, consisting of narrow metallic bars or strips which extend from one fire-stop to the adjacent one. These scrapers have bent ends 13 extending at right angles to their length, which are adapted to enter the respective slots 11, the slots being so positioned that the ends of the scrapers abut each other. The slots are of greater length than the width of the ends 13, and as these ends fit them sufficiently loose to permit the scrapers to slide in the slots when the device is rotating rapidly the scrapers will fly out against the flue-surface and remove the incrustation; but they are so small and narrow that they do not interfere with the free passage of the flame and products of combustion through the flue.

The rotation of the device can be accomplished at any time by coupling a suitable motor 14 to the end of the pipe 6, projecting into the smoke-box 3. A steam-pipe 15 is used to supply the necessary pressure to the

motor. The exhaust-steam from the motor passes through pipe 6 and out through the apertures 8 with sufficient pressure to remove the incrustation loosened by the scrapers and to assist them in their work.

The scraping of the flues can be had while the boiler is steaming and without impairing its efficiency, because the stops remain in the flue and equalize the column of flame throughout it the same as they do when the motor is not in use and when they are stationary. Ordinarily the air alone is sucked into the pipe 6 by the draft and issues from the outlets 8, thus assisting the equalization of the flame and preventing it from tapering, as explained in detail in my former patent, No. 172,302.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a combined fire-stop and scraper for boiler-flues, the combination with a rotatable pipe having outlets, of fire-stops secured to the pipe at intervals apart one ahead of the other and designed to allow the flame to pass over them, scrapers carried by the fire-stops which operate by centrifugal force, and a steam-motor for turning the pipe and stops and supplying steam to the former.

2. In a combined fire-stop and scraper for boiler-flues, the combination with a fire-stop, of a pipe screwed into the fire-stop, said fire-stop being chambered beyond the end of the pipe and provided with inclined outlets lead-

ing from the chamber to the exterior of the stop.

3. In a combined fire-stop and scraper for boiler-flues, the combination with fire-stops suitably spaced apart one ahead of the other and having wings provided with radial slots, of a scraper extending from one stop to the other having its ends loosely fitted in said slots and adapted to be thrown outward by centrifugal force.

4. In a combined fire-stop and scraper for boiler-flues, the combination with fire-stops suitably spaced apart and having wings provided with radial slots, of a scraper consisting of a bar having bent ends loosely received in said slots and adapted to be thrown outward by centrifugal force.

5. In a combined fire-stop and scraper for boiler-flues, the combination with a fire-stop having double wings each provided with a slot, of scrapers having their ends positioned between said double wings and their extremities bent, the bent extremity of one scraper being loosely received in one slot and that of the other scraper being loosely positioned in the other slot.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

CYRUS S. DEAN.

Witnesses:

VERNON E. HODGES,  
RALPH S. WARFIELD.

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