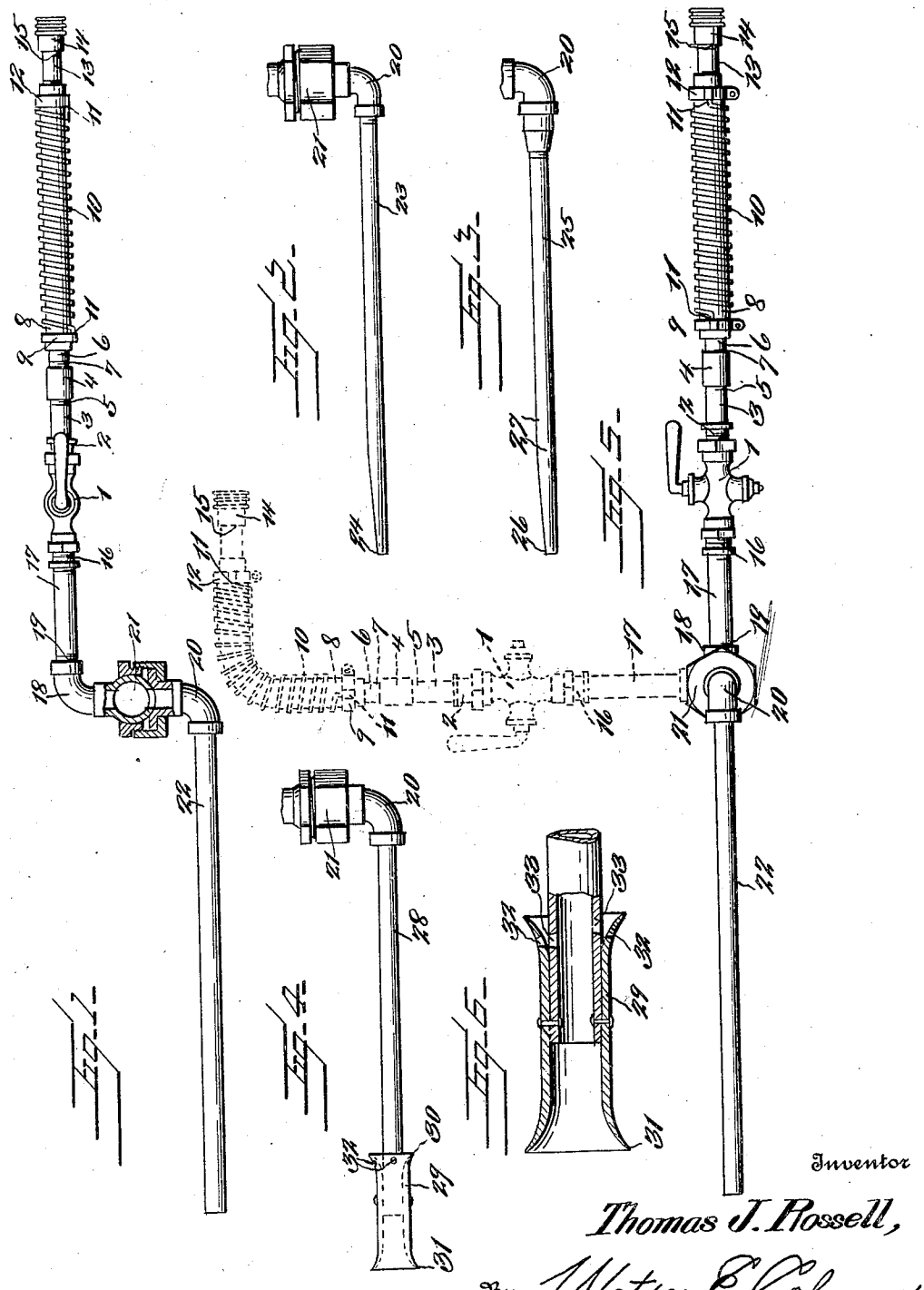
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FLUE CLEANER.

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FLUE-CLEANER.

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To all whom it may concern:

Be it known that I, THOMAS J. ROSSELL, a citizen of the United States, residing at New Smyrna, in the county of Volusia and State of Florida, have invented certain new and useful Improvements in Flue-Cleaners, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to the art of flue cleaners, and more especially to that class of cleaners particularly adapted for cleaning the flues of boilers of stationary and locomotive engines.

One of the objects of the invention is to provide an improved flue cleaner particularly formed in the form of a conduit having a fluid passage therethrough from one end to the other and so constructed that the flue cleaning tube (which may be plain or provided with a special scraper on its end) may be easily and very quickly handled for cleaning the flues of a boiler while the locomotive is in use.

Furthermore the flue cleaning device, which is in a conduit form is capable of being bent up adjacent the coal board or bent down from the top of the cab or one end of the conduit may be bent laterally adjacent the tender whereby the flue cleaning tube may be easily and very quickly manipulated in the very small space between the tender and the boiler of the locomotive.

A further object of the invention is to provide a flue cleaning device comprising a transverse two-part section for connecting a relatively rigid intermediate section and flue cleaning tube, whereby the intermediate section and tube are relatively offset from each other, there being a universal connection between the two parts of the transverse section whereby the cleaning tube may be manipulated in various directions, in combination with a flexible section connected at one end to the intermediate section and having at its other end a union coupling for connecting to a source of air or other fluid supply, the flexible section being capable of bending in various directions, and means in the intermediate section for controlling the fluid through the obstructed passage through the flue cleaning conduit.

While the design and construction at present illustrated and set forth is deemed preferable, it is obvious that as a result of a reduction of the invention to a more practical form for commercial purposes, the invention may be susceptible to changes, and the right to these changes is claimed, provided they are comprehended within the scope of what is claimed.

The invention comprises further features and combination of parts, as will be hereinafter set forth, shown in the drawings and claimed.

In the drawings:

Figure 1 is a plan view of the improved flexible flue cleaner, constructed in accordance with the invention, and showing a flue tube attached, for cleaning saturated flues.

Fig. 2 is a view of the cleaning device showing a flue cleaning tube attached thereto, said flue cleaning tube having a gouge chisel point, particularly adapted for breaking through the hard sand carbon.

Fig. 3 is a view showing a flue cleaning tube attached to the device, and particularly adapted for cleaning the superheater units.

Fig. 4 is a view of the cleaning device, showing a flue cleaning tube attached, and provided with a scraper particularly adapted for scraping or cleaning soot carbon from the interior of the boiler flue, especially of oil burning engines.

Fig. 5 is a view of the flexible flue cleaner, showing a flexible section of the device in full lines in axial alinement with the flue cleaning tube, and showing in dotted lines the same flexible section bent or curved, particularly adapting the same, whereby it may accommodate itself from a position at the top of the cab, whereby the flue cleaning tube may telescope into the boiler flue more readily, so that the operator may handle the flue cleaning tube more efficiently.

Fig. 6 is a detail sectional view of the scraper of the flue cleaning tube 28.

Referring more especially to the drawings 1 designates a valve or cut-off cock, which may be any suitable shape or configuration and any conventional construction, preferably as shown. A suitable fitting 2 is threaded into one end of the casing of said valve or cock, and into the fitting a pipe sec-

tion 3 is threaded. A sleeve 4 is threaded to the pipe section as shown at 5, and a union 6 is connected to the sleeve 4 by means of threads 7. This union enters one end of a flexible tube 8, there being a clamping band 9 engaging about the flexible tube 8, in order to hold the flexible tube to the union. The flexible tube 8 may be any suitable material and coiled or wound about the flexible tube 8 is a heavy wire 10, preferably constructed of steel, thereby constituting a guard or shield for the tube. This wire may be cylindrical in cross-section, or rectangular, preferably the latter, or any other shape. One end of this wire may be secured between the clamping ends of the band 9, or may be secured between the band and the flexible tube, entering a recess of the band, as shown at 11. A similar connection of the other end of the wire may be effected with the clamping band 12, which clamps the other end of the flexible tube to the pipe section 13, to which a union 14 is threaded, as shown at 15. This union 14 is especially provided, in order to afford a hose connection (not shown), but which hose connection may be connected to any suitable source of air under pressure (not shown), whereby air may be allowed to pass through the flexible flue cleaner.

A nipple 16 is threaded into the other end of the valve or cock casing, and into the nipple 16 a pipe section 17 is threaded. An elbow 18 is threaded to the pipe section 17, as shown at 19. A second elbow 20 is provided, and as shown in Fig. 1, is positioned reversely to the elbow 18. The elbows 18 and 20 are coupled together by means of a flexible ball joint union 21. This flexible union or coupling may be any suitable or conventional construction, preferably of the type shown, whereby the intermediate pipe section 17 and the flexible tube 8 and the valve or cock casing 1 may be disposed as shown in dotted lines in Fig. 5. It is obvious that these parts may extend downwardly as well as upwardly, owing to the flexible ball coupling or union. The elbow 20 is particularly adapted for holding the flue cleaning tubes, such as shown in Figs. 1, 2, 3 and 4. In Fig. 1 a flue cleaning tube 22 (which is straight throughout its length) is connected to the elbow 20, and this cleaning tube is particularly adapted for cleaning saturated flues.

The tube 22 is employed equally as well as a scraper, as the scraper 29 in Figs. 4 and 6, or equally as well as the terminals 24 and 26 of the tubes 23 and 25, since when the tube 22 is inserted in the flue of the boiler, it may be disposed on an angle relatively to the flue, so that the terminal edge of the cleaning tube 22 can scrape against the inner surface of the flue, thereby cleaning the flue surface.

In Fig. 2 a flue cleaning tube 23 is connected to the elbow 20, and this cleaning tube is provided with a gouge chisel point 24 especially designed for breaking the hard sand carbon from the boiler flue.

In Fig. 3 a flue cleaning tube 25 is connected to the elbow 20. This flue cleaning tube 25 is also provided with a gouge chisel point 26, for scraping the hard sand carbon, and is also adapted for cleaning the super-heater flues. In order to accomplish the cleaning of super-heater flues, the flue tube 25 is provided with one or more perforations or apertures or orifices 27, and when this type of flue tube 25 is being utilized for cleaning the super-heater units, the air passing through the flue cleaning tube, after it emanates from the orifices, whirls or circulates on the interior of the boiler flue, thereby blowing soot carbon or soot sand, or ashes that is allowed to accumulate, and thereby preventing such accumulation of soot sand or soot carbon from becoming fused, which would result in the formation of clinkers. Clinkers formed in this manner consequently retard the passage of the hot gases through the super-heater elements. Obviously by removing such stoppage from the flues, the hot gases necessarily have a more efficient passage on their way from the heater. By keeping the super-heater flues free of soot sand or soot carbon, clinkers are prevented from forming.

In Fig. 4 another flue cleaning tube 28 is connected to the elbow 20, and carried by this flue cleaning tube is a compound tubular scraper 29, which may be connected to the flue cleaning tube 28 in any suitable manner, preferably by riveting. However, this scraper may be otherwise connected to the cleaning tube, in fact it may be made a part of the tube, or may be securely shrunk or threaded on the tube. This scraper is compound in construction, owing to both ends thereof being outwardly flared as shown at 30 and 31 constituting scraping means. Obviously, that when the flue tube 28 is reciprocated in the boiler flue, in order to scrape or remove the soot carbon, the scraping means 30 and 31 will impart scraping actions, when the tube 28 is moving in either direction telescopically through the boiler flue. By means of this particular construction of scraper, soot carbon and the like may be easily removed or scraped from the interiors of the flues, particularly of boilers on oil burning engines. This scraper is designed to be of a diameter large enough to enter the boiler flue freely, so that it can easily scrape the soot carbon, when the scraper is moving in either direction. This scraper is provided with one or more perforations or apertures 32, which register with the apertures in the wall of the flue cleaning tube 28, so as to keep the rear

scraper end 30 clean. In other words, the soot carbon that may collect between the wall of the scraper end 30 and the outer or exterior surface of the tube 28 may be blown through the apertures. Further, the air which may pass through the tube 28, will also percolate through the apertures 33 of the tube 28, and then through the apertures 32, and also circulate between the wall of the scraper end 30 and the tube 28, in order to loosen up the soot carbon. Furthermore, the air which passes through the tube 28, as it leaves the scraper end 31, also acts to blow or feed the soot carbon toward and out through the rear end of the boiler flue, where it is consumed or carried off by the products of combustion of the oil burner. The apertures 32 and 33 may be any suitable size, and their number may be increased or decreased, as the case may be. This style of compound or double scraper has been found to be most effective and efficient, particularly for the removal of soot carbon.

The flexible tube 8 may be any suitable length, preferably long enough, so that the union coupling can be used in working over large fires.

The flexible ball joint is designed to be well lubricated so that the various parts extending from opposite sides of the joint may work freely, in order to attain the best results in cleaning boiler flues.

In Fig. 1 the flexible hose or tube 8 is arranged straight, as when the cleaning tube is in telescopial connection with the boiler flue, either when the fire is in use or dumped. This flexible tube or hose 8 particularly allows the device to bend down from the top of the cab.

By virtue of the flexible ball joint the intermediate pipe section 17 and the flexible tube 8 are allowed to bend up adjacent the coal board of coal burning engines, or adjacent the sand box of an oil burning engine.

This flue cleaning device is particularly adapted to be used at the end of every round trip of a locomotive engine or while taking coal or water, or when the train is waiting, since it is possible to clean the flues of the boiler without dumping or cooling off the fire.

As hereinbefore stated, this device is particularly adapted for detecting collapsed flues, by the use of either one of the tubes 22, 23, 25 and 28, for instance when inserting any one of these tubes into the boiler flue should it come in contact with an obstruction, due to the collapsed wall of the boiler flue, the tube would be limited in its movement, consequently disclosing the fact that there is a stoppage or obstruction that cannot be removed by scraping or by the force of air through the tube. When such a case occurs the boiler flue may be easily removed and a new one inserted. In view of this, the importance of the device is clearly apparent.

This device may be used on locomotive, stationary and steam-ship boilers and the like, the use in connection with one being as effective as when used in connection with another.

This device may also be used, by using a portion of a bell cord on a corner of the cab to the tank, allowing the intermediate pipe section to rest or swing on the cord, so that when the flue tube is inserted into a boiler flue for the purpose of removing the stoppage, it can be inserted until the flexible or ball joint comes in contact with the flue sheet. When this is accomplished the air pressure in the flue tube is in point of contact with the stoppage or obstruction, forcing the same back into the fire box, where it is consumed or carried off by the smoke or products of combustion. The flue tube can be any suitable length, so that it can be easily handled between the coal board of coal burning engines and the flue sheet, or between the sand box of oil burning engines and the flue sheet. The length of the intermediate section 17 may be varied, but preferably it is designed to be long enough consistent with the length of the fire box according to the style of engine. The diameters of various tubes or intermediate pipe sections or flexible tube 8 may be varied, if desired.

This particular flue cleaning device is especially adapted for knocking off the honeycomb on the flue sheet, as it will not injure the bead of the flue by striking it. As the honeycomb is knocked off, by scraping it down, the air getting between it and the flue sheet peels it off. In striking the flue sheet in order to rupture or knock off the honeycomb, the tone created will indicate the particular boiler flue that needs cleaning.

In operating the flue cleaning tube telescopically, the nut of the flexible ball joint or coupling will strike the bridges between the flues, and such striking action will not rupture or hurt the bead of an adjacent flue. Many flues have been injured and rendered useless by striking or rupturing the honeycomb on the flue sheet with long rods or pipes. Therefore, the present invention may be employed for this purpose, thereby avoiding injury to the boiler flues, consequently preventing them being rendered useless.

In practice, the connections between the flexible ball joint and the elbows may be made with coarse threads, so that the connections of such parts may be effected quickly. The present invention not only functions as a flue cleaner but also constitutes a device for the detection of defective boiler flues. Furthermore the air which is

designed to pass through the flue cleaning tube keeps the tube cool and from burning the air, during its passage through the tube becomes heated and when it escapes from the end of the tube, it acts to clean the boiler flue, in addition to the flue being scraped by the scraper.

The invention having been set forth, what is claimed as new and useful is:

1. In a flue cleaner having an unobstructed fluid passage therethrough from one end to the other, the combination with a pair of elbow parts reversely disposed, of a relatively rigid conduit section connected to one of the parts and terminating at one end in a flexible conduit section having coupling means at the end thereof, means carried by the rigid section for controlling said fluid through said passage, a flue cleaning tube carried by the other part, and having scraping means at the terminal end thereof, and means for uniting the two parts universally, whereby the tube may swing in various directions and under the rigid section.

2. In a flue cleaner, a transverse two-part section, a relatively rigid section connected to one part, and terminating in a flexible section provided with coupling means at the end thereof, a cleaning tube connected to the other part, a universal joint uniting the two parts and having scraping means at the terminal end thereof, and a valve in said relatively rigid section to control the fluid through the cleaner.

3. In a flue cleaner, a flue cleaning tube having a scraper on one end, a relatively rigid conduit section, terminating at one end in a flexible section having a coupling union at the end thereof, means carried by said rigid section for controlling the fluid through the cleaner, a transverse offset section comprising two parts connected to the adjacent ends of the tube and the rigid section and means for universally uniting the two parts of said transverse offset section, whereby the tube may be swung in various directions and under the rigid section.

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

THOMAS J. ROSSELL.

Witnesses:

JOSEPH G. FLENNER,

NATHAN S. MANLEY.