Jan. 13, 1925. 1,523,288

G. I. RAWSON

BOILER CLEANER

Filed April 10, 1919

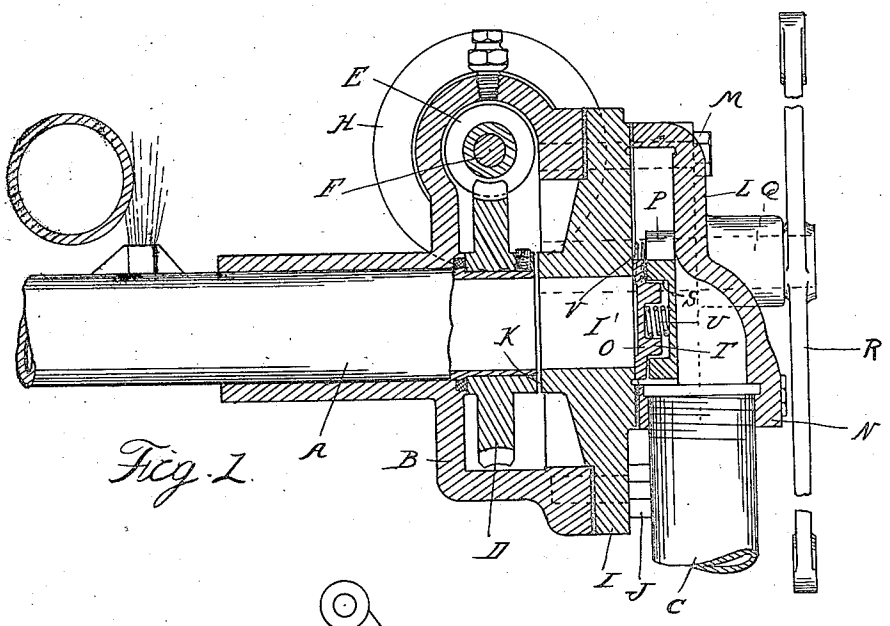


Fig. 1.

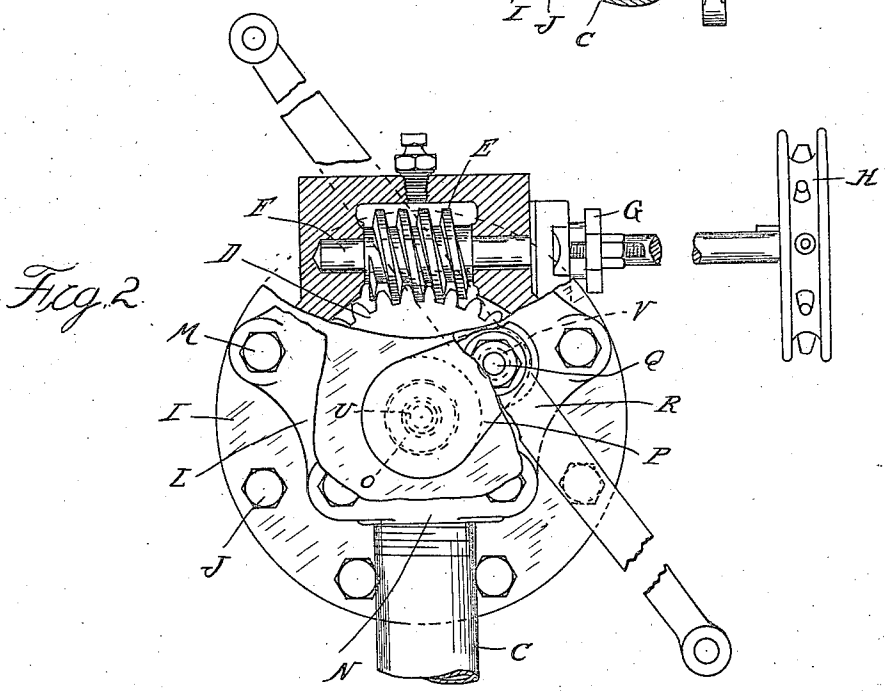


Fig. 2.

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UNITED STATES PATENT OFFICE.

GRANT I. RAWSON, OF ROSLYN HEIGHTS, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO DIAMOND POWER SPECIALTY CORPORATION, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

BOILER CLEANER.

Application filed April 10, 1919. Serial No. 288,964.

To all whom it may concern:

Be it known that I, GRANT I. RAWSON, a citizen of the United States of America, residing at Roslyn Heights, in the county of Nassau and State of New York, have invented certain new and useful Improvements in Boiler Cleaners, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to boiler cleaners of that type employing steam which is conducted to the blower pipe or nozzle through a supply conduit which is valve controlled.

It is the usual practice to locate the valve in the supply conduit at some distance from the point of connection with the blower pipe, and where the latter is of the rotary type the steam is conducted thereto through a swivelled head. Various difficulties have arisen in the use of such apparatus, among which are; first, if the valve is not absolutely steam tight the slight leakage of steam therethrough will, during the period in which the blower is idle, cause an accumulation of condensation, so that when the valve is opened a quantity of water will be discharged into the boiler chamber and against the heated surface. This is very detrimental and is entirely avoided by my improved construction. Second, where the steam is suddenly turned on, the initial impact of the stream against the swivelled head will severly stress the same and it frequently happens that the supporting brackets are broken. Third, the mechanism for rotating the blower pipe is separated from the controlling valve so that the same operator can not conveniently control both. Fourth, the placing of the controlling valve in the supply conduit necessitates the cutting of the same and complicates the work of installation.

To avoid the difficulties just enumerated I have devised a construction in which the control of the steam is adjacent to the point of connection between the supply line and the blower tube. Preferably the steam is controlled by a valve located in the head to which the blower tube is connected and in which, in case of a rotary blower, said tube is swivelled. My invention also comprises a means for operating the valve and for withdrawing the same completely out of the path of the steam so as to produce an unobstructed fluid area. My invention therefore comprises various features as hereinafter more fully described.

In the drawings I have shown one specific embodiment of my invention in which—

Figure 1 is a longitudinal section through the head of a rotary blower, showing my improved construction applied thereto;

Figure 2 is an end elevation, partly in section.

A is the rotary blower tube which is journaled in a head member B to which is also connected the supply conduit C. The head B is chambered to receive a worm gear D secured upon the blower tube A, and this gear is driven by a worm E mounted on a shaft F which passes out through a packing gland G and is actuated by suitable means, such as the sprocket H, for receiving an operating chain. The outer end of the head B is closed by a member I secured thereto by suitable means such as the tap screws J. The member is centrally apertured at I′ to form an opening the full cross-sectional area of the blower pipe A, while the inner end K of said member forms an abutment for holding the blower pipe in place. L is a hollow cap member secured to the member I by tap screws M or other suitable means, said member having the threaded nipple N for connection with the supply conduit C. Within this member L is a valve, preferably a slide valve O, which as shown is circular and is adapted in one position to close the aperture I′ and cut off all communication between the supply conduit C and the blower pipe. The valve O is operated by a rock arm P which is secured to a rock shaft Q passing out through a bearing in the cap member L and connected to a lever R or other means of operation. The connection between the rock arm P and valve O is preferably formed by making a circular recess S in the rock arm, in which recess there is received a circular boss T on the valve, while a spring U interposed between these members serves to hold the valve to its seat. By this arrangement the valve is slid across its seat upon the rocking of the rock arm P, in the same way as if it were an integral part of the arm P. A second spring V may be placed in alignment with the rock shaft Q to hold the rock arm P against the outer wall of the cap and prevent leakage of steam.

With the construction as described, when the blower unit is installed in a boiler the head of steam will extend through the conduit C to the hollow cap member L, but communication with the blower tube is cut off by the valve O which normally closes the aperture I'. As there is nothing to obstruct the free communication between the chamber and the cap member L and the conduit C, there is no chance for accumulation of condensation, so that whenever the valve is opened steam alone will be discharged into the blower pipe. When the apparatus is used for cleaning, a rocking of the lever R will shift the valve O from its position closing the aperture I' to a position within the hollow cap member where it completely clears said aperture and opens up an unobstructed communication with the conduit C. This operation will not cause any sudden stress or impact against the blower head, for the full steam pressure at all times extends to the cap L, and the opening of the valve will only permit the discharge of the stream into the blower tube.

The construction simplifies the work of installation, for the blower heads may be located where ever desired and the supply conduits extended thereto without consideration as to location of the valve. The operating means for the valve and for rotating the blower are also in close proximity where they can be controlled by a single operator.

In the appended claims it will be understood that by the term "rotary blower unit" is meant not only a blower unit which might be rotated continuously in one direction as in the illustrative form, but also any other form of rotary unit, such as the well-known form in which the unit is rotated for a part of a turn in one direction and then back again. While the greatest number of advantages is obtained when my device is used with steam as a cleaning fluid, it will be understood that some of these advantages will be obtained with other cleaning fluids such as compressed air. Consequently, it will be understood that by steam in the appended claims, I mean that or any other suitable cleaning fluid.

What I claim as my invention is:—

1. The combination with a rotary blower unit and a steam supply conduit therefor, of a hollow head forming a connection between said conduit and unit, mechanism for operating said unit located within said hollow head, a partition within said hollow head having a port therethrough in alignment with said blower unit, and a valve located within said head beyond said partition for controlling said port, and mechanism for operating said valve.

2. The combination with a rotary blower unit and a steam supply conduit therefor, of a hollow head forming a connection between said conduit and unit, mechanism for operating said unit located within said hollow head, a partition within said head having a port therethrough in alignment with said unit, said partition holding the blower unit in place, a valve located within said head beyond said partition for controlling said port, and mechanism for operating said valve.

3. The combination with a rotary blower unit, of a chambered head in which said unit is journaled, a cover member secured to said head formed with a port in alignment with the unit, a casing secured to said cover member, a supply pipe leading into said casing, a valve within said casing controlling said port, and actuating means for said valve.

4. The combination with a rotary blower unit, of a steam supply conduit therefor, and a compact unitary structure forming a connection between said steam conduit and blower unit, said structure carrying a gearing for driving the unit and a valve for controlling the supply of steam to the unit, and valve operating means independent of said gearing.

5. The combination with a rotary blower unit and a steam supply conduit therefor, of a unitary head forming the connection between said steam conduit and blower unit and comprising a valve for controlling the supply of steam from said conduit to said unit and reduction gearing for rotating the unit, and valve operating means independent of said gearing.

6. The combination with a rotary blower unit, and a chambered head in which said unit is journaled, of a steam supply conduit opening into said head, mechanism within said head for rotating said unit, a member carried by the head providing a port intermediate said mechanism and the steam supply conduit, and a valve within the head controlling said port.

7. The combination with a rotary blower unit, and a steam supply conduit therefor, of a hollow head forming a connection between said conduit and unit, a member within said head holding the unit in place and providing a port substantially aligned with said unit, and a valve controlling said port.

8. The combination with a rotary blower unit, and a steam supply conduit therefor, of a hollow head forming a connection between said conduit and unit, a partition within said head ported in substantial alignment with the unit, a valve controlling said port between said partition and said conduit, and mechanism for actuating the unit within said head at the other side of said partition.

9. In a boiler cleaning apparatus, the combination with a rotary blower unit and a steam supply conduit therefor, of a head

assembly forming a connection between said conduit and blower unit, and forming a swivel connection for said blower unit, said assembly including a valve, means for rotating said blower unit including reduction mechanism for slowly turning said blower unit about its axis and separate means for actuating said valve and said reduction mechanism whereby a relatively short movement of the valve actuating means will quickly open the valve and a relatively long movement of the unit actuating means will be required to rotate the unit through a substantial arc of rotation.

10. In a boiler cleaning apparatus, the combination with a rotary blower unit and a steam supply conduit therefor, of a head assembly forming a connection between said conduit and blower unit, and forming a swivel connection for said blower unit, said assembly comprising a hollow head and a valve encased within said head, and a sprocket wheel for rotating said blower unit and a pivoted lever for actuating said valve whereby the valve and the blower unit may be separately actuated from a convenient point distant from the head assembly.

11. In a boiler cleaning apparatus, the combination with a rotary blower unit, and a steam supply conduit therefor, of a head assembly forming a connection between said conduit and blower unit and forming a swivel connection for said blower unit, said assembly comprising a hollow head and a plate-like valve member encased within said head and slidably movable across the flow of steam for controlling the supply of steam from said conduit to said blower unit.

12. In a boiler cleaning apparatus, the combination with a rotary blower unit and a steam supply conduit therefor, of a head assembly forming a connection between said conduit and blower unit and forming a swivel connection for said blower unit, said assembly comprising a hollow head and a valve member encased within said head and slidably movable across the flow of steam for controlling the supply of steam from said conduit to said blower unit, said valve being arranged to swing about a pivot.

13. In a boiler cleaning apparatus, the combination with a rotary blower unit and a steam supply conduit therefor, of a head assembly forming a connection between said conduit and blower unit, said assembly comprising a hollow head and a plate-like valve member encased within said head and slidably movable across the flow of steam for controlling the supply of steam from said conduit to said blower unit, and yieldable means for holding said valve to its seat.

In testimony whereof I affix my signature.

GRANT I. RAWSON.