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PATENTED JAN. 14, 1908.

F. H. LEHNERT.
TUBE AND FLUE CLEANER.
APPLICATION FILED MAY 2, 1907.

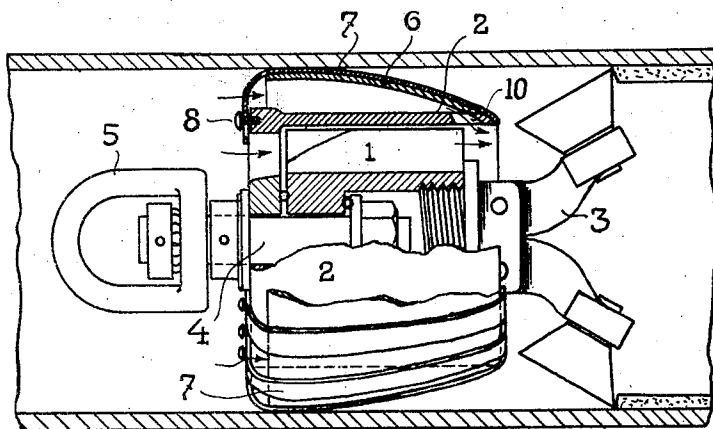


Fig. 1.

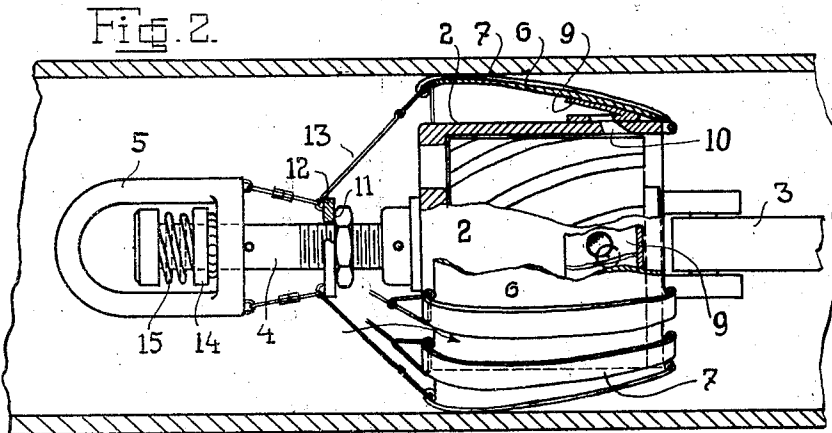


Fig. 2.

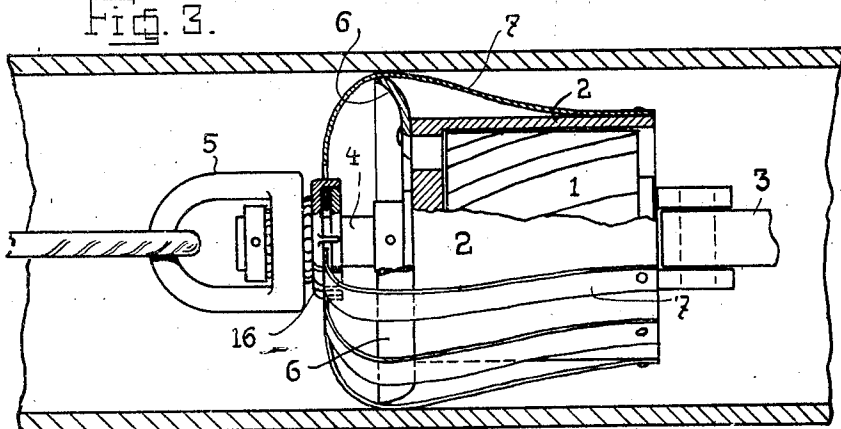


Fig. 3.

Witnesses

S. W. WATKINS
Ryle R. Simon

Inventor
Franz Heinrich Lehnert
by Paul B. Schiering
his attorney

UNITED STATES PATENT OFFICE.

FRANZ HEINRICH LEHNERT, OF DRESDEN-PLAUN, GERMANY.

TUBE AND FLUE CLEANER.

No. 876,566.

Specification of Letters Patent.

Patented Jan. 14, 1908.

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To all whom it may concern:

Be it known that I, FRANZ HEINRICH LEHNERT, a subject of the Emperor of Austria-Hungary, residing at Dresden-Plauen, Saxony, German Empire, have invented certain new and useful Improvements in Tube and Flue Cleaners, of which the following is a specification.

My invention relates to an implement for cleaning boiler flues, pipes and tubes of various kinds, of that class in which an elastic device fits tightly against the wall of the pipe being cleaned, while a cleaning tool is driven by means of a turbine or other motor mounted in a casing.

My invention consists in the provision of an elastic shell, washer, or sleeve between the housing of the turbine or driving device and a basket of flat springs or the like, the said washer or sleeve filling, after the manner of a packing, the space between the turbine housing and the walls of the pipe or tube and thus insuring the passage of the pressure agent, to drive the motor, through the housing.

To permit of variation of the diameter of the basket the springs of which it is constructed are connected only at one end to the turbine housing, while the other end receives suitable guidance.

The basket may be connected with appropriate means whereby when the cleaner is withdrawn from the pipe or tube by a guide line or rope, the basket, together with the packing, collapses.

Three forms of construction of my improved pipe cleaner are illustrated in the accompanying drawing:

Figure 1 is an elevation and part section showing the first form located in a pipe. Fig. 2 is a similar view of a modification in which the spring basket can be collapsed by drawing upon the guide rope. Fig. 3 is a like view of a second modification, in which the packing is of shallow dished form instead of the sleeve form of Figs. 1 and 2 and is secured at the rear end of the housing.

Referring more particularly to Fig. 1, the pipe cleaner consists of a shaft 4 upon which is rotatably mounted the driving device 1 provided with buckets or blades and housed in the casing 2, which is rigidly secured to the shaft 4. The cutter head 3 is fixed in the driving device. At the rear end of the shaft 4 there is a swivel loop or the like 5 to which a guide rope can be attached. To enable

cleaning of pipes of different diameters, or of piping in which there are internal prominences, such, for instance, as the plugs of cocks, or in which there are recesses of one kind or another, a packing-sleeve or washer 6 of elastic material, such as rubber or leather, is secured to the turbine housing 2.

7 are flat springs assembled around the packing sleeve 6 and attached to the housing 2. The assemblage of springs constitutes a basket to protect the packing sleeve 6 and also enables the cleaner to be withdrawn from the pipe. Each spring is furnished with a slot at its rear end, through which passes a pin 8, screwed into the housing 2. The latter is provided with peripheral apertures 10 to permit any excess of the pressure agent and any dirt which may follow the cleaner and lodge between packing sleeve and housing to pass through the implement, whereby the danger of the implement becoming choked in the pipe either by too great outward pressure of the pressure agent upon the packing and springs or by accumulation of matter in the packing sleeve, is obviated.

In the modification shown in Fig. 2 the spring basket 7 and packing 6 can be collapsed by pulling the guide rope of the implement. For this purpose the shaft 4 is threaded at the rear end to receive a nut 11, behind which is a sliding disk 12 connected with the loop 5. The latter bears against a disk 14 between which and the head of the shaft 4 there is a coiled spring 15. The disk 12 and the various springs 7 are connected with each other by wire ropes 13 or the like, the front ends of the springs being hinged to the housing. In Fig. 2 a ring is shown, pushed over the housing 2, in order to decrease the resiliency of the packing 6 and the spring basket 7. This ring 9 may be furnished with holes corresponding with the apertures 10 in the housing 2, so that by rotating the ring the apertures 10 may be more or less closed. In this manner the pressure acting upon the cleaner can be very readily regulated, since the larger the passage afforded by the apertures 10, the greater the quantity of the pressure agent that will pass through the implement without doing work.

In the modification shown in Fig. 3, the packing 6 is of dish form and is secured at the back of the housing 2 and the rear ends of the springs 7 receive guidance from a special disk 16 mounted on the shaft 4.

the operation of the pipe cleaner is as follows:—After the implement has been introduced into the pipe, it is driven forward by means of a suitable pressure agent, such as water, whereby the turbine 1 is set in motion and the cutter head rotated. The housing 2 naturally does not partake of this rotary motion. Owing to the action of the pressure agent the packing 6 will be forced against the wall of the pipe, undue wear being prevented by the spring basket 7. Since there is a perfect joint the entire quantity of water is utilized, there being no waste. Should the pressure be too great, a portion of the pressure agent will pass through the apertures 10 in the housing 2 can be opened to a greater or less extent by rotation of the ring 9, so that a portion of the pressure agent passes through the cleaner without doing useful work. On the cleaner being withdrawn from the pipe for any reason, the springs 7 will prevent the packing from being turned outside in, whereby the implement would become jammed in the pipe. In the construction shown in Fig. 2 the pull on the rope causes collapse of basket and packing, since the spring 15 yields and permits the swivel loop 5 and disk 12 to be drawn back, whereby, again, the springs 7, connected with the disk 12 are drawn down. The nut 11 serves as stop for the disk 12 and by means of it the maximum diameter of the packing can be regulated.

What I claim is:

1. In a pipe cleaner, in combination, a shaft; a housing secured thereto; a rotary tool driving device mounted in the housing; an elastic packing located outside the housing and adapted to bear against the wall of the pipe being cleaned; and a spring basket surrounding the said elastic packing; substantially as described.

2. In a pipe cleaner, in combination, a shaft; a housing secured thereto; a rotary tool driving device mounted in the housing; an elastic packing located outside the housing and adapted to close the space between the housing and the wall of the pipe being cleaned; springs surrounding said packing and secured at their front ends to the housing and having a limited radial movement at their rear ends; substantially as described.

3. In a pipe cleaner, in combination, a

shaft; a housing secured thereto; a rotary tool driving device mounted in the housing; an elastic packing located outside the casing and adapted to close the space between the housing and the wall of the pipe being cleaned; an assemblage of springs surrounding said packing and secured to the housing; and means for regulating the passage of the pressure agent through the housing; substantially as described.

4. In a pipe cleaner, in combination, a shaft; a housing presenting peripheral perforations secured thereto; a rotary tool driving device mounted in the housing; an elastic packing located outside the housing and adapted to close the space between the housing and the wall of the pipe being cleaned; a spring basket surrounding said packing and an annular rotary member located between said housing and packing and presenting perforations corresponding with those in the housing, whereby the flow of the pressure agent through said latter perforations can be regulated; substantially as described.

5. In a pipe cleaner, in combination, a shaft; a housing secured thereto; a rotary tool driving device mounted in the housing; an elastic packing located outside the casing and adapted to close the space between the housing and the wall of the pipe being cleaned; an assemblage of springs surrounding said packing and secured at the front end to the housing; and means for regulating the resiliency of the springs; substantially as described.

6. In a pipe cleaner, in combination, a shaft; a housing secured thereto; a rotary tool driving device mounted in the housing; an elastic packing located outside the housing and adapted to close the space between the housing and the wall of the pipe being cleaned; a spring basket surrounding said packing; and an annular member located between the latter and the housing for the purpose of diminishing the resiliency of the packing and spring basket; substantially as described.

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

FRANZ HEINRICH LEHNERT.

Witnesses:

PAUL ARRAS,
CLÁRE SIMON.