Oct. 20, 1925. 1,558,445

F. LJUNGSTRÖM

SOOT BLOWING APPARATUS FOR REGENERATIVE HEATING DEVICES

Filed Nov. 2, 1922

Fig. 1

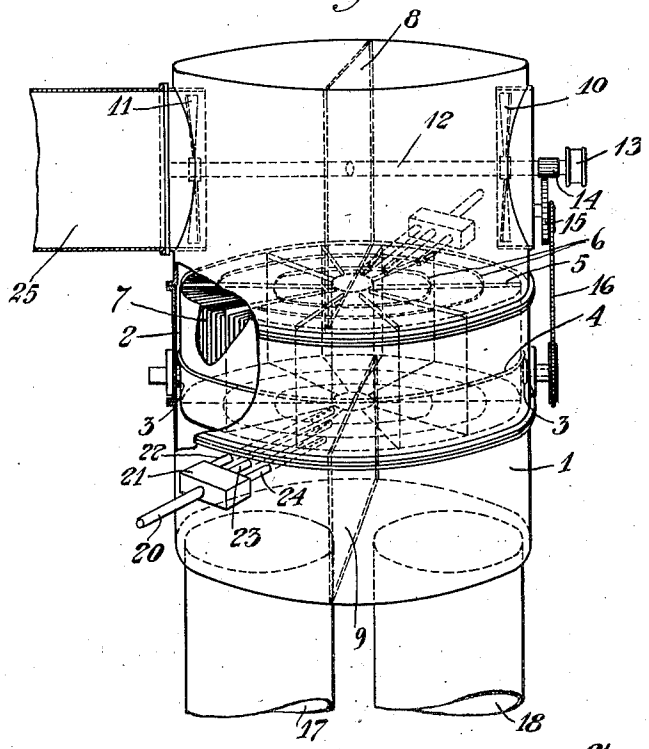


Fig. 2

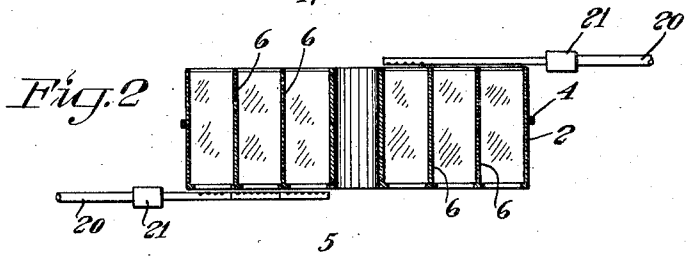
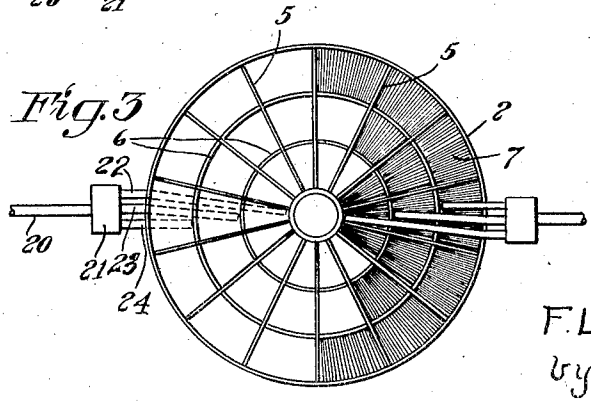


Fig. 3



Inventor
F. Ljungström
by Marks & Clerk
Attys.

Patented Oct. 20, 1925. 1,558,445

UNITED STATES PATENT OFFICE.

FREDRIK LJUNGSTRÖM, OF BREVIK, LIDINGON, SWEDEN, ASSIGNOR TO AKTIEBOLAGET LJUNGSTROMS ÅNGTURBIN, OF STOCKHOLM, SWEDEN, A CORPORATION.

SOOT-BLOWING APPARATUS FOR REGENERATIVE HEATING DEVICES.

Original application filed April 11, 1921, Serial No. 460,600. Divided and this application filed November 2, 1922. Serial No. 598,657.

To all whom it may concern:

Be it known that I, FREDRIK LJUNGSTRÖM, chief engineer, a subject of the King of Sweden, residing at Brevik, Lidingon, Sweden, have invented certain new and useful Improvements in Soot-Blowing Apparatus for Regenerative Heating Devices, of which the following is a specification.

This invention relates to improvements in or relating to cleaning or soot blowing apparatuses operating by means of steam or the like and adapted for regenerative heating devices.

This application is a divisional of my copending application Ser. No. 460,600 filed April 11, 1921.

The invention has for its object to provide a cleaning or soot blowing apparatus for regenerative heating devices of such kind in which fluids pass alternately through the same passages of a heat transmitting material and in which the body to be cleaned is continuously movable for instance rotatable, which cleaning apparatus is simple, easily operable and effective in use.

According to the invention said soot blowing apparatus consists of one or more pipes supplying the cleaning fluid and arranged close by the regenerative body and provided with an outlet or outlets directed against the body. By this means it will be possible to clean the body from soot during operation. Preferably the cleaning pipe or pipes are stationary, but evidently they may also be movably mounted, for instance in such a way as to permit of being moved lengthwise.

In case of the body containing the regenerative material being in the form of a disk and passed in opposite directions by the fluid giving off heat and that to be heated, a very powerful effect may be obtained by arranging one or more cleaning apparatuses according to the invention above the disk and one or more apparatuses below the same, said cleaning apparatuses thus blowing in opposite directions.

An embodiment of the invention is illustrated in the accompanying drawing in which—

Fig. 1 is a diagrammatic view of a conventional rotatable regenerative heating device provided with soot blowing apparatuses according to the present invention.

Fig. 2 is a vertical section of the rotor containing the regenerative material as shown in Fig. 1 together with the cleaning apparatuses.

Fig. 3 is a plane view of Fig. 2.

Referring to Fig. 1, the heating device consists of a cylindrical vessel 1, horizontally divided into three compartments, the middle one containing a rotating cylindrical member 2, called the rotor provided with a flange 4 resting on rollers 3 journalled inside of the vessel 1. The rotor is by means of radial and peripheral partitions 5 and 6 respectively divided into a number of compartments, each of which being filled with so called regenerative material 7. This material is built up from thin steel sheets as shown at the left hand of Fig. 1, where the cylindrical casing 1 and the cylindrical mantle 2 of the rotor are broken away. In this manner a great number of axial channels or passages through the rotor are formed.

In the other two compartments diaphragms 8 and 9 are arranged parallel to each other and to the geometrical axis of the rotor, thus dividing the vessel 1 into four compartments of which the two upper ones by means of the great number of passages though the rotor communicate with the corresponding lower ones, or in other words, the vessel 1 is axially divided into two halves, the one fluid being confined to one side of the diaphragms 8 and 9 and the other fluid to the other side.

Two fans 10 and 11 are mounted on a common shaft 12 in the upper compartments of the vessel 1. By means of these fans the required circulation of the fluids is secured. The shaft 12 is driven by means of a pulley 13 from a suitable source of power. From the shaft 12 the rotor is driven by the same source of power by means of gears 14, 15, chain 16, sprocket wheels and the driving roller 3.

The fluid giving off heat, for instance hot flue gases, is introduced through the inlet channel 17 and passes the rotor 2 while giving off the greater part of its heat content to

the regenerative material and is finally exhausted and impelled to the stack by the fan 11 and the pipe 25. The fluid to be heated, for instance air, is sucked in by the fan 10 and traverses the apparatus in the reverse direction and is forced out through the outlet channel 18 after having absorbed the heat stored in the regenerative material.

The cleaning apparatus combined with this regenerative heating device is constructed as follows. 20 designates a pipe supplying the cleaning fluid, as steam or the like. 21 is a distributing device, for instance a cock, and 22, 23 and 24 designate three pipes provided with holes or slots admitting the cleaning fluid. Each pipe operates upon a separate part of the rotor 2. If the rotor 2 is to be swept in its totality a single pipe may be substituted for the three pipes 22, 23 and 24.

In Figs. 2 and 3 the rotating disk 2 and the cleaning apparatuses 20—24 are shown lifted out of the vessel 1.

Such a cleaning apparatus may, preferably, as shown in the drawing, be disposed above the disk 2 and another similar apparatus beneath the same, the cleaning operation thereby being very effectual since soot particles not removed by blowing in one direction will easily be removed by blowing in opposite direction.

I claim:—

1. In a regenerative heating device in which the fluid to be heated and the fluid giving off heat pass alternately through the same passages of the regenerative material, the combination with a continuously rotating body containing the regenerative material, of a stationary pipe supplying the cleaning fluid and arranged close by the movable body, said pipe being provided with outlets directed against said body.

2. In a regenerative heating device in which the fluid to be heated and the fluid giving off heat pass alternately through the same passages of the regenerative material, the combination with a continuously rotating body containing the regenerative material, of a cleaning apparatus arranged at each side of the rotating body and operating in opposite directions, each of said cleaning apparatuses comprising a pipe supplying the cleaning fluid and arranged close by the movable body, said pipe being provided with outlets directed against said body.

In testimony whereof I affix my signature.

FREDRIK LJUNGSTRÖM.