

(No Model.)

J. N. BARNUM.  
BOILER CLEANER.

No. 520,250.

Patented May 22, 1894.

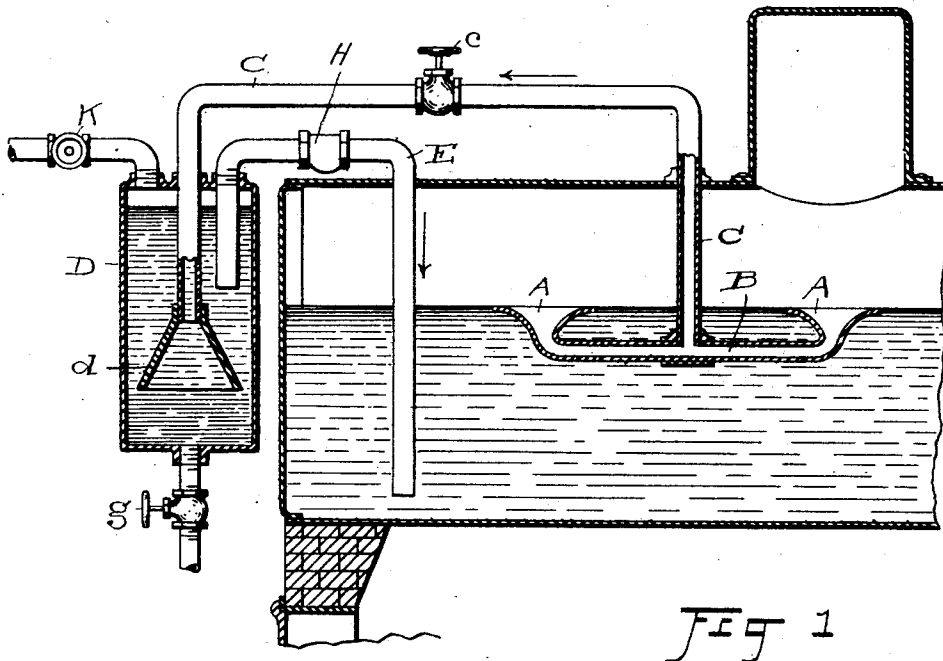
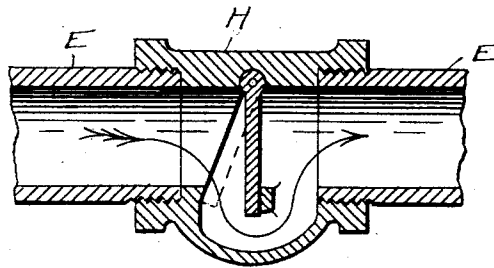


Fig 1

Fig 2



WITNESSES

R. B. Moser.  
G. S. Scharff.

INVENTOR

John N. Barnum

By H. J. Fisher.

ATTORNEY

# UNITED STATES PATENT OFFICE.

JOHN N. BARNUM, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-THIRD TO  
JOHN H. BARNUM, OF SAME PLACE.

## BOILER-CLEANER.

SPECIFICATION forming part of Letters Patent No. 520,250, dated May 22, 1894.

Application filed October 7, 1893. Serial No. 487,408. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN N. BARNUM, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Automatic Boiler-Cleaners and Surface-Blowers; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to automatic boiler cleaners and surface blowers, and the object of the invention is to remove from the water the extraneous substances that may gather upon the surface of the water, and to remove the same to a trap provided therefor outside of the boiler. It occurs in cases where the waste steam from the engine is returned to the boiler that there is a considerable quantity of lubricating oil carried with the steam and deposited upon the water in the boiler. It also occurs that foreign matter of one kind and another is conveyed into the boiler with the water, and that in time these foreign substances form scales on the sides of the boiler, which impair its efficiency and render a cleaning necessary and are otherwise obnoxious to good work. Various devices have from time to time been employed to relieve the boiler of these accumulations, and I do not claim that my invention is the first which has been intended for this purpose or which serves this function at least in a measure, but I am not aware that any one has ever before made or used a construction and combination of parts which has the characteristics of my invention, or which operates in the same way.

My invention, therefore, consists in the construction and combination of parts substantially as shown and described and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of a boiler and furnace with my improved automatic cleaning mechanism in working position thereon, the boiler being broken away in part. Fig. 2 is an enlarged sectional view of a portion of the return pipe from the top, and showing the check valve in said pipe, and which

is adapted to operate as hereinafter more fully described.

This construction is adopted with a view to simplicity as well as efficiency, and consists of the fewest number of parts possible to accomplish the results for which it is intended.

First, I have a pair of drain pans or receivers A, of a substantially funnel shape, as ordinarily shown, though the shape may be changed if desired, and supported upon the ends of a pipe B. These pans are arranged with their flaring mouths or top surfaces to come about where the surface of the water ordinarily will be, and a pipe C, formed in two or more joints, as may be necessary, extends from the pipe B through the top of the boiler and into what I choose to call a trap D. This trap consists of a cylinder of suitable size and length, which may be of glass, so as to disclose the conditions within the same, or of any other suitable material whether it be transparent or not, and the pipe has its downward extremity extending into this trap below its middle where it is provided with a bell shaped or flaring discharge —d—, which goes down somewhat near to the bottom of the trap. A suitable valve —c— is shown here as connected with the pipe C, whereby the said pipe may be closed, if desired. The trap D ordinarily will be filled substantially full with liquid, and in order that a circulation of the water from the boiler, which is conveyed by the pipe C, may be established through the trap, I provide a return pipe E which dips into the trap to about one-third of its depth from the top, and has its extremity so arranged with respect to the trap that it will neither disturb nor draw off the lighter substance which rises to the top of the trap above its mouth, nor the heavier substances which deposit in the bottom of the trap. In this way I am enabled to entrap the foreign substances from the boiler, while at the same time I maintain a healthy circulation through the trap which detains said substance. The flaring or funnel shaped delivery point of the pipe C is calculated to be very nearly as wide as the width of the trap or cylinder D, and by reason of this construction the said part —d— assists in detaining and

confining the heavier foreign substances in the bottom of the trap, and such as will rise past this part in the very nature of things are so light that they will also go above the mouth of the pipe E. Now, assuming that both the pipes C and E are open, and the device is in operation, the water will enter the trap through the pipe C and return through to the boiler through the pipe E, and both the heavy and the light substances will be detained in the trap. This accumulation may continue until it be of sufficient quantity to be drawn off. When this occurs I open the valve —g— in the bottom of the trap D, and in this way I can very quickly blow out the heavier deposits therein. Then, however, it is also important that the return pipe E be closed, and to this end I have provided said pipe with a self-acting check valve H, seen in Fig. 2. Normally the said valve will occupy the position shown in full lines in said figure, but when the valve —g— is opened to blow out the trap from the bottom, the back pressure from the boiler will instantly close said check valve H to the position seen in dotted lines, and then the pipe C alone will be in open communication with the boiler. As soon as the valve —g— is closed the normal conditions of the parts will be restored and both the pipes C and E will be open, as usual.

It will be noticed that the pipe E has its return stem in the boiler extending down pretty well toward the bottom of the boiler, which is calculated to create a movement of the water from the bottom toward the top, and to carry up the heavier matter which otherwise would have tendency to deposit in the bottom of the boiler.

In traps of this kind the purpose is to entrap the heavy deposits at the bottom of cylinder or chamber D, and the lighter and floating matter, such as oil and the like, in the upper part of said chamber or cylinder. It will be understood that in practical operation the cylinder D is about four feet in length and it is filled with water usually near to its top. Hence the elbow of pipe E always dips into the water and the flare —d— as well as the pipe for some distance above the same is always immersed in water. It follows that

the steam will condense before it reaches the head —d—, and since this head flares as shown there is very little disturbance therein when the device is in operation, and there is no discharge from the pipe having the valve K. As already described, the valve —g— is opened when it is desired to discharge the heavy deposits from the cylinder D, but when it is desired to discharge the light deposits from said cylinder the valve —g— remains closed and the valve K is opened. The pressure from the boiler will then force the lighter deposits from the top of this chamber through the pipe and valve K, while the heavy deposits at the bottom will remain there. Of course the check valve H will respond to this discharge the same as to the discharge through the bottom pipe and close the outflow passage through pipe E.

Having thus described my invention, what I claim is—

1. The boiler, the surface pans A therein, the cylindrical trap D at the end of the boiler, the elbow pipe C leading from the surface pans into the trap D and having the funnel shaped attachment —d— on its end, the elbow pipe E having one end extending part way into the said trap D and having a valve therein, and the discharge pipe in the top of cylinder D having a valve, whereby the lighter deposits may be discharged, substantially as set forth.

2. The combination described, consisting in the boiler, the surface pans —A— therein, the trap —D—, the pipe —C— extending from the surface pans into the said trap, the discharge pipe in the bottom of the trap having a valve, the return elbow pipe —E— dipping into the said trap and into the boiler, respectively, and provided with a joint having a swinging valve therein, whereby when the discharge pipe and valve leading from the trap are open the said pivoted valve will automatically close the passage through the pipe —E—, substantially as set forth.

Witness my hand to the foregoing specification this 28th day of September, 1893.

JOHN N. BARNUM.

Witnesses:

H. F. FISHER,  
R. B. MOSER.