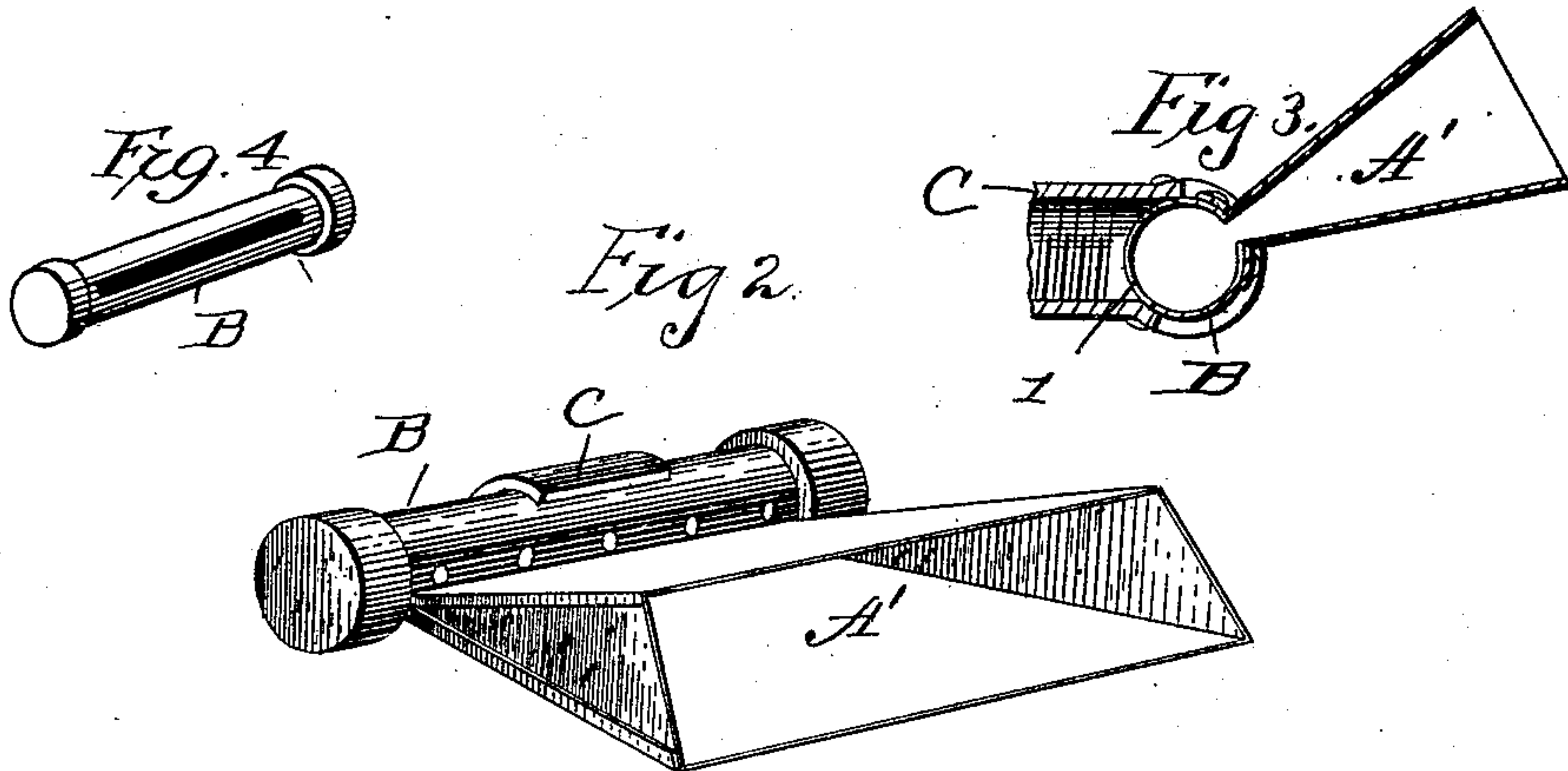
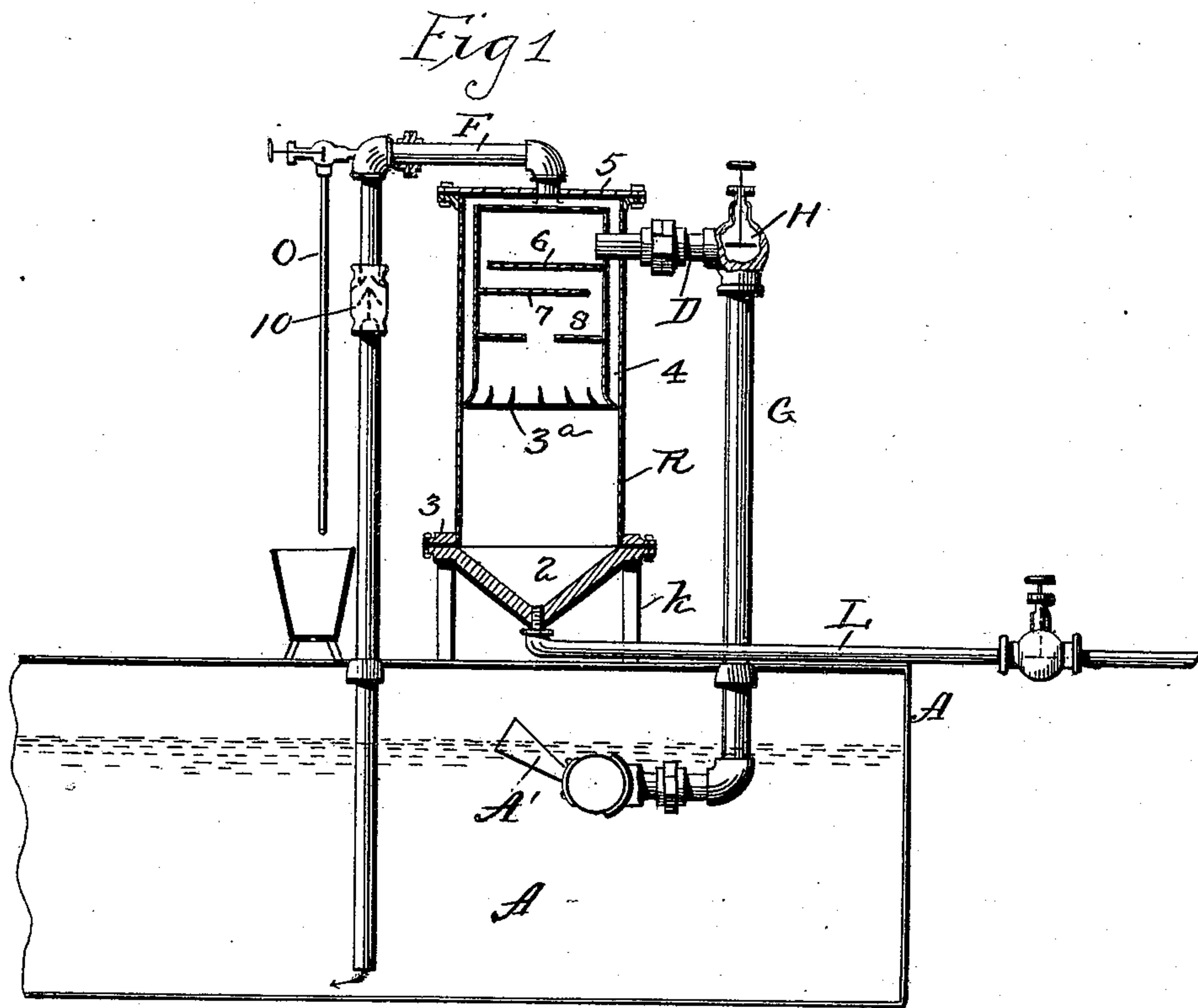


(No Model.)

H. HAYES.  
BOILER CLEANER.

No. 483,919.

Patented Oct. 4, 1892.



Attest  
William Hall  
James M. Spear

Inventor  
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by Walter S. Muldwin & Co.  
Atty

# UNITED STATES PATENT OFFICE.

HULBERT HAYES, OF ELIZABETHTOWN, OHIO.

## BOILER-CLEANER.

SPECIFICATION forming part of Letters Patent No. 483,919, dated October 4, 1892.

Application filed May 27, 1892. Serial No. 434,646. (No model.)

*To all whom it may concern:*

Be it known that I, HULBERT HAYES, a citizen of the United States of America, residing at Elizabethtown, in the county of Hamilton and State of Ohio, 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.

10 It is the object of my invention to provide a simple and effective purifier for steam-boilers; and the invention consists in the various combinations of features hereinafter particularly pointed out.

15 In the drawings, Figure 1 is a vertical section through the entire apparatus. Fig. 2 is a detail view of the skimmer. Fig. 3 is a sectional view of the same. Fig. 4 is a view of one of the parts detached.

20 The boiler A is of ordinary construction. The skimmer is intended to reach entirely across the boiler, and I desire to provide an inexpensive and simple form of skimmer which shall be durable and effective. It consists of a pipe B, of sufficient length to reach across the boiler, having a slot extending longitudinally thereof, and provided with a cap on its screw-threaded ends to close said ends. Over the slot a funnel A' is secured, of elongated form, it being attached by the screws passing through the flanges on the funnel. The pipe has a central rear opening 1, over which is secured the coupling C by the screws passing through the flanges thereof into the pipe. Into this the lower end of the jointed upflow-pipe is screwed, which pipe extends above the boiler and connects through a branch D with the mud-drum R, arranged above the boiler on supports k and having a conical bottom 2, bolted to the flanges 3. Within the mud-drum and connecting with the branch D is the precipitator. This is of smaller diameter than the mud-drum, so as to leave a space 4 around the outside of the precipitator and over its top, which is closed by the plate 5. The bottom of the precipitator is open and reaches about half-way down the drum, the lower edge being turned out to bear on the inner side of the mud-drum. This bent edge is slitted, as shown at 3<sup>a</sup>, and

thus forms a screen for the water and sediment, which passes down through the precipitator around the alternately-arranged plates 6 7, which form a circuitous passage for the circulation of the water, which finally passes through the central opening in the lower plate 8. The mud and silt are precipitated by the plates and finally fall to the bottom of the drum, this bottom being conical and this action being materially aided by the screening action of the outwardly-bent edge of the precipitator having the slits. The purified water passes up around the precipitator, out through the branch pipe F, and through the return-pipe reaching within the boiler. This return-pipe may connect with the boiler at any desired point. A valve H controls the flow of the water through the upflow-pipe G to the precipitator, while a valved pipe L controls the blowing off of the collected silt from the conical base of the mud-drum. The return-pipe is provided with an upwardly-operating check-valve 10, which closes automatically when the valve in the pipe L is opened, and thus maintains the circulation through the skimmer and the upflow-pipe, preventing the suction created by this blowing-off action from drawing the water from the boiler up through the return-pipe. A valved blow-off pipe O is employed in connection with the return-pipe for starting the circulation, the water blown out being caught by any suitable receptacle.

It will be noticed that the funnel of the skimmer extends all the way across the boiler, as does also the slot in the cross-pipe B. This collects the scum effectively and directs the same to the pipe G.

I claim as my invention—

1. In a purifying apparatus, the skimmer consisting of the pipe extending transversely across the boiler and having closed ends and a slot extending longitudinally along its front side approximately from end to end, the funnel extending from end to end of said slot, and the upflow-pipe connecting centrally with the rear side of the transverse pipe, substantially as described.

2. In combination, the boiler, the skimmer, the upflow-pipe, the mud-drum, the precipi-



tator of less diameter secured within the drum and having the precipitator-plates, the lower edge of the said precipitator being slitted and bent outwardly against the mud-drum, and  
5 the return-pipe and the blow-off, substantially as described.

3. In combination, the boiler, the mud-drum, the upflow and return pipes, the blow-off leading from the mud-drum, and the valved blow-

off pipe leading from the return-pipe, substantially as described.

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

HULBERT HAYES.

Witnesses:

JNO. W. CHRISTY,  
ROBERT KEHLENBEER.