

No. 835,477.

PATENTED NOV. 6, 1906.

S. A. SHUTER.
HEATING APPARATUS.
APPLICATION FILED FEB. 10, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

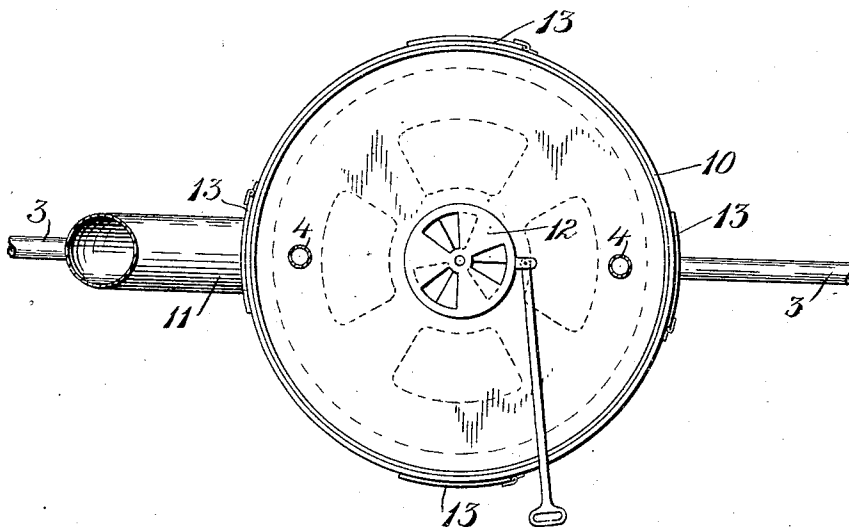
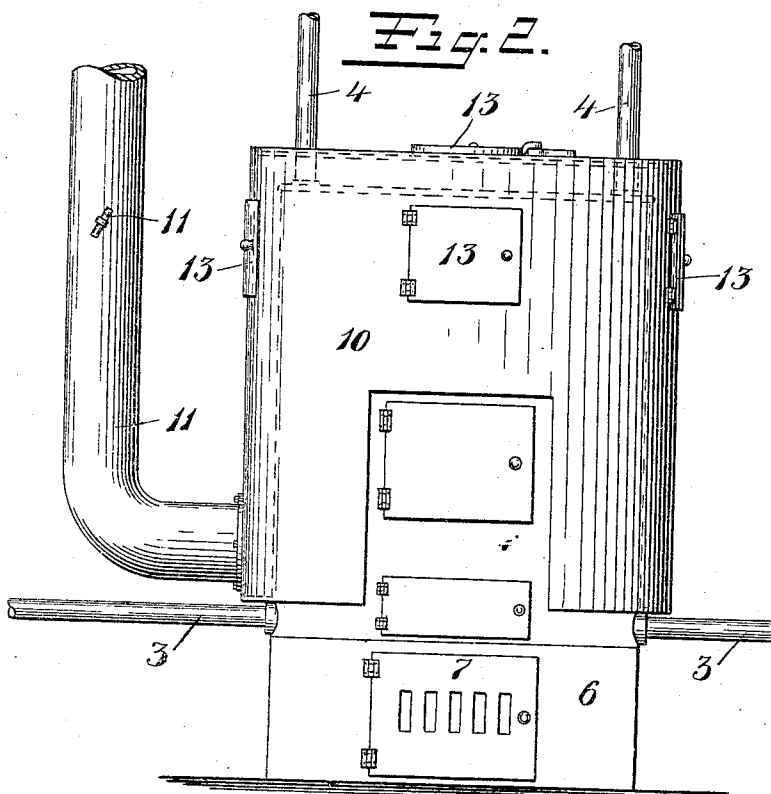


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

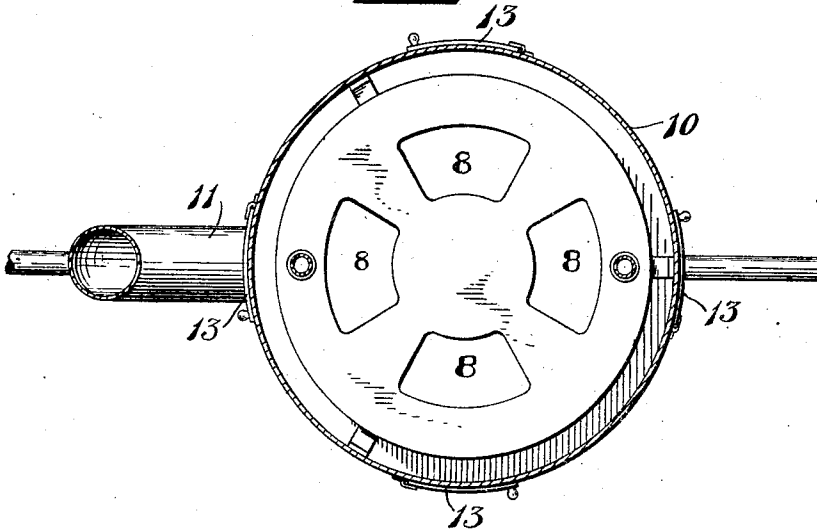
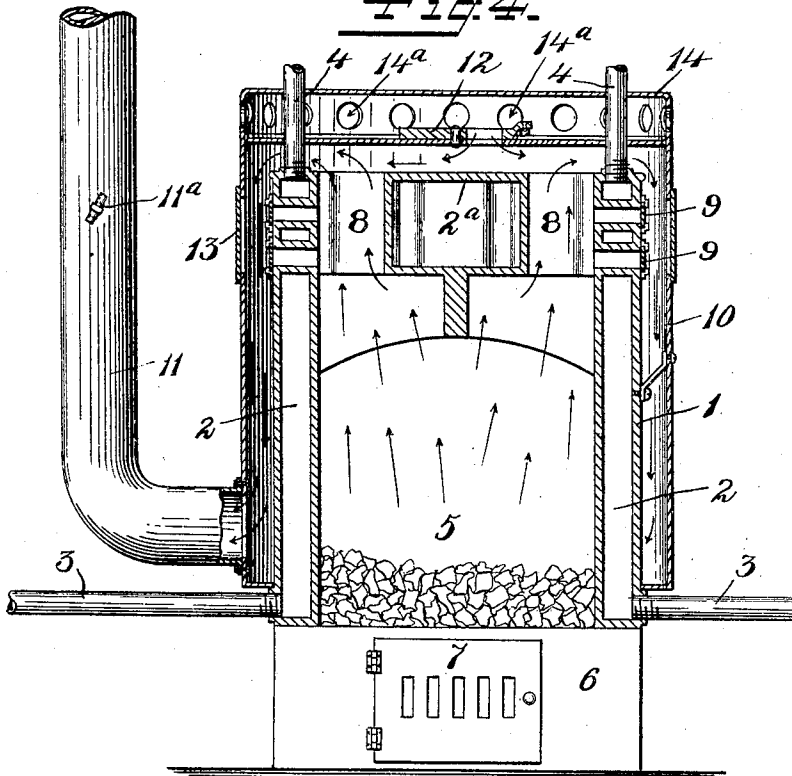


Fig. 4.



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UNITED STATES PATENT OFFICE.

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HEATING APPARATUS.

No. 835,477.

Specification of Letters Patent.

Patented Nov. 6, 1906.

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To all whom it may concern:

Be it known that I, SIDNEY A. SHUTER, a subject of the King of Great Britain, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Heating Apparatus, of which the following is a full, clear, and exact description.

My invention consists in improvements in heating apparatus, and particularly to an attachment which may be applied to the ordinary steam or hot-water heater for increasing the effectiveness thereof and, as a result, substantially reducing the expense of fuel.

I have discovered that by the use of a certain new and useful attachment, hereinafter more fully described, and illustrated in the accompanying drawings, I can render more effective the ordinary heaters, such as are now in use, and reduce substantially the cost of fuel employed therein. This advantage I attain by the use of a simple metallic jacket which affords a supplemental external combustion-chamber around the heater, into which oxygen is admitted from a suitable source and in suitable quantities, so that the unconsumed gases which would ordinarily be sent out directly through the smoke-pipe and wasted will be consumed at a point where they will be usefully availed of.

In the accompanying drawings, Figure 1 is a plan view of a heater provided with my improvement. Fig. 2 is a front elevation thereof. Fig. 3 is a plan view of the heater proper, the top of the jacket being removed, the side wall being shown in section. Fig. 4 is a vertical sectional view showing a modification.

Since my apparatus is appropriate for use in connection with heaters of many different forms, it will be seen that the invention relates rather to the attachment than to the heater proper. I will describe, therefore, a heater of well-known construction without going into unnecessary detail.

In the drawings I have shown a well-known type of hot-water heater, in which 1 is the external wall thereof.

2 2 are the spaces in which the water to be heated is contained.

3 3 are hot-water-inlet pipes, and 4 4 are hot-water-outlet pipes.

5 is the fire-pot.

6 is the usual base provided with the ash-door 7.

8 8 are the ordinary flues.

9 9 are doors or shutters whereby access may be had from outside to clean the flues.

My attachment comprises a jacket 10, completely enveloping that portion of the heater within which the hot-water-circulating space is formed, the said jacket providing a space above and at the sides of said heater through which the unconsumed gas arising from the coals must pass on its way to the smoke-pipe 11. The smoke-pipe 11 is connected to the jacket 10 at or near its lower end, as shown in the drawings.

12 is a damper arranged in the upper part of the jacket 10 and preferably out of the direct course of the gases as they emanate from the fire-pot. In the particular construction shown the ceiling 2^a of a portion of the heater is directly under the damper 12 and the adjacent inlet port or ports and acts to baffle the course of the gas away from said air-inlet. The smoke-pipe 11 may be provided with the usual damper 11^a.

13 13 are doors or cover-plates in the jacket 10, whereby access may be had to the doors or shutters 9 9.

In the operation of an ordinary heater I have discovered that the products of combustion which are ordinarily allowed to pass off through the smoke-pipe contain a large percentage of useful heat-giving gas, which if combined with a suitable amount of oxygen will ignite and burn until the final product is substantially valueless. To utilize the valuable properties of the gases ordinarily wasted many means have been devised. My invention, however, comprises a simple though highly-effective apparatus, combining merely a jacket for the heater forming an annular space around said heater, through which space the gases are obliged to pass before being discharged to the smoke-pipe. While in this space the gases retain their high degree of temperature; but the area of the space is such that such gases become extremely attenuated before reaching said smoke-pipe. The attenuated gas is supplied with oxygen or fresh air directly upon leaving the heater-flues 8 8, and this oxygen becomes so uniformly distributed throughout the jacketed space that it combines with the

unconsumed products of combustion to form a gas which is ignited while in the dome of the fire-pot and remains ignited until entirely consumed, which occurs before the useless products pass into the smoke-pipe.

Any suitable form of damper 12 may be employed to admit air or oxygen; but in the preferred form it comprises a damper which will admit of the graduation of the supply to meet the desired conditions.

In Fig. 4 I have shown a slight modification, in which a supplemental air-chamber is provided over the dome of the jacket 10. This supplemental air-chamber is indicated at 14, and in the side walls of said chamber are perforations 14^a, which permit air to freely enter. Within this chamber the air is heated to a high degree before rushing in through the ports of damper 12. I have found that superior results can be obtained by heating the air before allowing it to enter the combustion-chamber within the jacket 10.

What I claim, and desire to secure by Letters Patent, is—

1. The combination with a heater having a fire-pot and flues therein leading from the upper part thereof, of an external jacket forming a gas-combustion chamber, a smoke-pipe leading from the lower part of said jacket, an air-inlet leading into the upper part of said jacket and out of line with the flues and adjacent to an imperforate part of the heater to supply oxygen to the gas flowing from the flues to the smoke-outlet.

2. The combination with a heater having a fire-pot and flues therein, of an external jacket forming a gas-combustion chamber, a smoke-pipe leading from the lower part of said jacket, an air-inlet in the upper part of said jacket, and an air-chamber overstanding the air-inlet damper, with air-inlets in the side walls of said air-chamber to admit air to said damper-inlets.

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Witnesses:

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