No. 811,199. PATENTED JAN. 30, 1906.

W. H. & W. G. CALHOUN.

HEATER.

APPLICATION FILED MAY 15, 1905.

Fig. 2

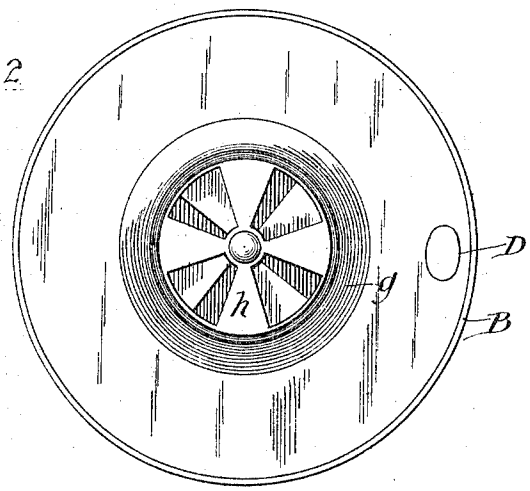
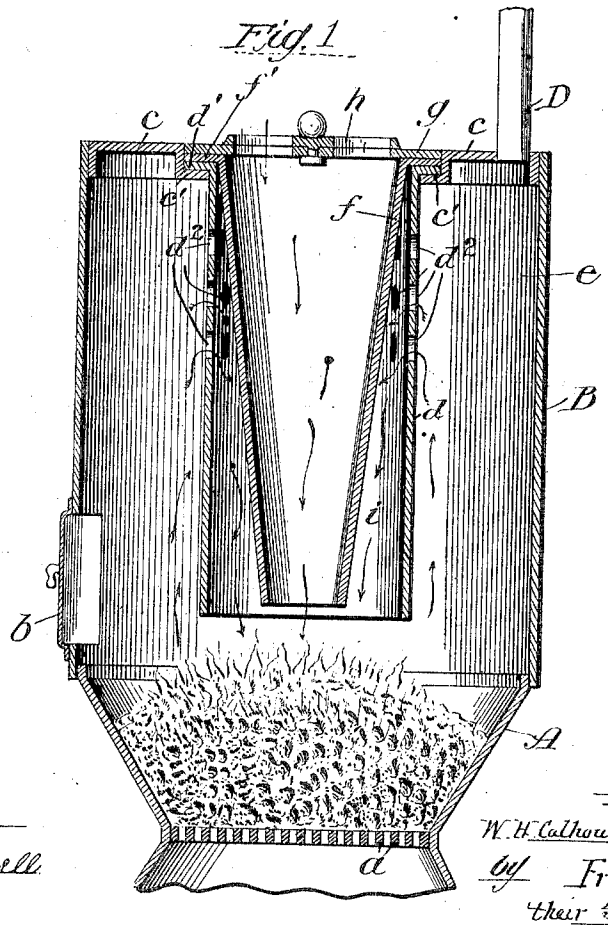


Fig. 1



Witnesses:
Pate D. Keller
Leone S. Russell

Inventors
W. H. Calhoun & W. G. Calhoun
by Fred Gerlach
their Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM H. CALHOUN, OF MARSHALLTOWN, IOWA, AND WILLIAM G. CALHOUN, OF FARGO, NORTH DAKOTA, ASSIGNORS OF ONE-HALF TO EDWARD H. UHL, OF CHICAGO, ILLINOIS.

HEATER.

No. 811,199. Specification of Letters Patent. Patented Jan. 30, 1906.

Application filed May 15, 1905. Serial No. 260,400.

To all whom it may concern:

Be it known that we, WILLIAM H. CALHOUN, a resident of Marshalltown, in the county of Marshall and State of Iowa, and WILLIAM G. CALHOUN, of Fargo, in the county of Cass and State of North Dakota, have jointly invented certain new and useful Improvements in Heaters, of which the following is a clear and exact description.

The invention relates to the construction of heaters, such as stoves or furnaces, in which provision is made for the consumption of gas and smoke and designs to provide an improvement in which a current of cold air or oxygen is inducted to the fuel-bed and in such manner as to produce a suction whereby the unconsumed gaseous products and smoke will be drawn into the fire and there consumed.

The invention consists in the several novel features hereinafter set forth, and more particularly defined by claims at the conclusion hereof.

In the drawings, Figure 1 is a vertical section of a stove embodying the invention. Fig. 2 is a plan view.

A denotes the fire-pot of a stove provided with a grate *a*, which may be of any suitable construction. An outer wall or drum B extends upwardly from the fire-pot and has secured thereto a cap or top-plate *c*. A door *b* for the introduction of fuel is provided.

D is a smoke-pipe leading to the chimney.

On a ledge *c'* of the cap rests a flange *d'* of an inner drum *d*, which extends from the cap downwardly to a point near the fuel. Between inner drum *d* and outer wall B is formed a chamber *e*, in which the gaseous products rising from the fire-pot pass, as indicated by the arrows. Within the inner drum is arranged an inverted conoidal cold-air duct *f*, which is held in proper relation by a flange *f'*, resting on flange *d'* of drum *d*. A cover-plate *g* closes the upper end of the cold-air duct *f*, and a register-valve *h*, having openings therein adapted to register with openings in cover-plate *g*, controls entry of cold air into the cold-air duct. The top or induction end of the cold-air duct is large, while the lower end thereof, which terminates near the fire-pot, is contracted or of smaller size. The purpose of this inverted conoidal form of cold-air duct is to produce a strong draft at the egress end thereof. Drum *d* is provided with perforations d^2, having sufficient aggregate area to cause the gaseous products to be drawn therethrough into chamber *i*, formed between drum *d* and the wall of the cold-air duct.

In operation the cold air or atmospheric oxygen will enter duct *f* through register *h*, and the fire in the fire-pot will attract the oxygen through the restricted egress end of duct *f*, which will result in combustion of the fuel and produce a strong draft of air at the lower end of cold-air duct and adjacent the fuel-bed. The draft produced at the lower end of duct *f* will be sufficient to draw most of the gaseous products from the upper portion of chamber *e* through perforations *d'*, downwardly in chamber *i*, and into the fire. It will be observed that the supply of cold air or oxygen is conducted into close proximity to the fire-bed and does not commingle with the gas and smoke in its passage to the fuel-bed and that the gaseous products and smoke are drawn back onto the fire-bed. The supply of air directly to the fuel-bed without first combining with the gases causes effective combustion and intense heat.

Manifestly the invention is not restricted to the details of construction described, but may be modified without departing from the spirit and scope of the invention.

It will be understood that the invention can be applied to different forms of heaters, such as furnaces, stoves, and boilers.

Having thus described the invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A heater, comprising a fire-pot, an inclosing wall forming a chamber receiving the gaseous products rising from the fuel, a central air-duct leading downwardly in said chamber into proximity to the fuel-bed, an open-bottomed drum surrounding said air-duct and provided with a series of openings near the induction end only of the air-duct and an exit-tube or smoke-pipe situated at

one side of said drum and in free communication with said chamber at or near the upper part thereof.

2. A heater, comprising a fire-pot, an inclosing wall forming a chamber receiving the gaseous products rising from the fuel, a central air-duct leading downwardly in said chamber into proximity to the fuel-bed and having a tapered outlet, an open-bottomed drum surrounding said air-duct and provided with a series of openings near the induction end only of the air-duct and an exit-tube or smoke-pipe situated at one side of said drum and in free communication with said chamber at or near the upper part thereof.

WILLIAM H. CALHOUN.
WILLIAM G. CALHOUN.

Witnesses to the signature of William H. Calhoun:

J. M. WHITAKER,
S. DICKERSON.

Witnesses to the signature of William G. Calhoun:

THOS. E. DUNN,
ROBT. MCCULLOCH.