

No. 746,084.

PATENTED DEC. 8, 1903.

C. S. HOOD.  
SOFT COAL FURNACE.  
APPLICATION FILED FEB. 12, 1903.

NO MODEL.

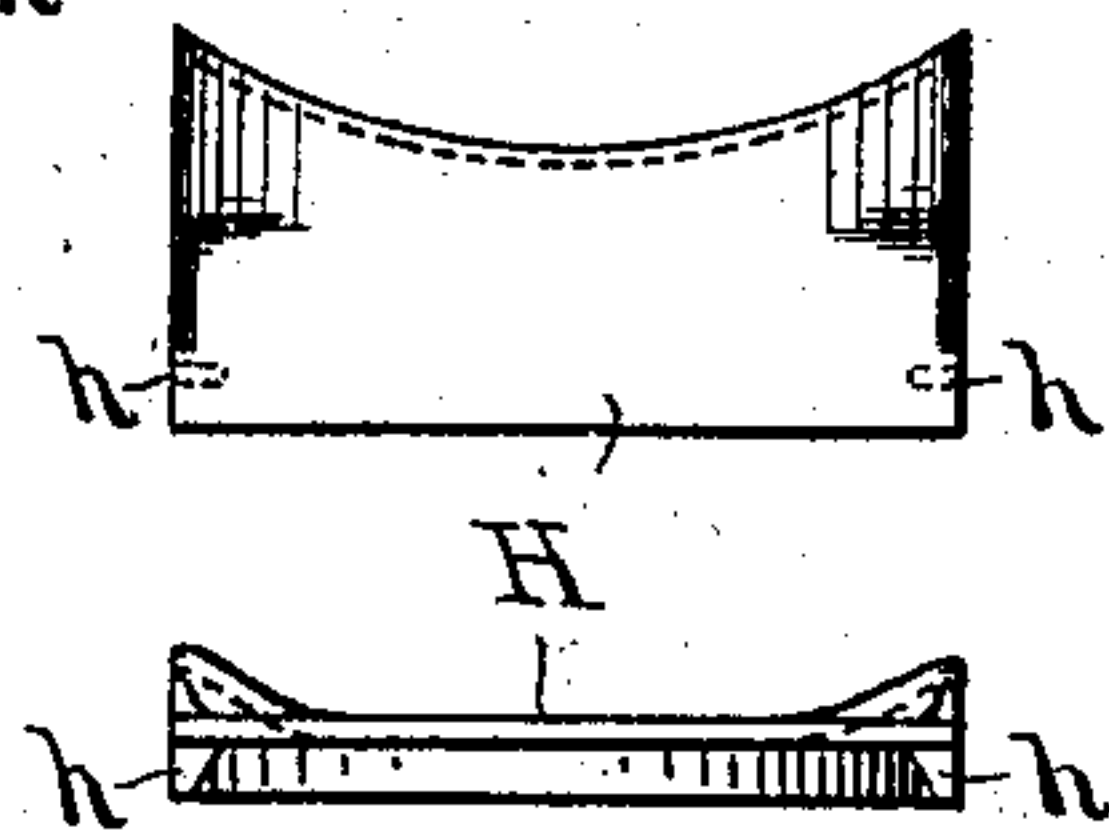
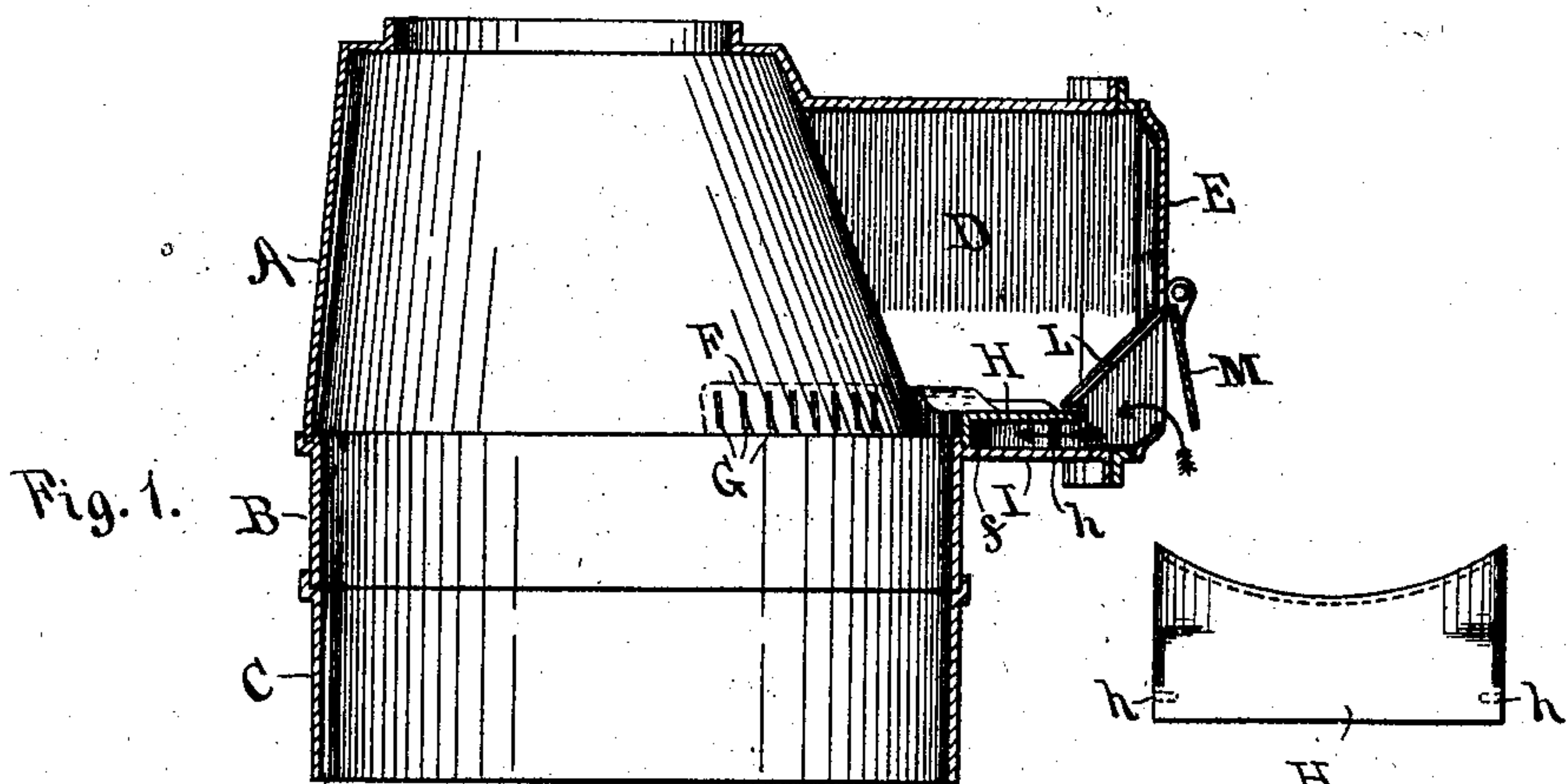


Fig 4.

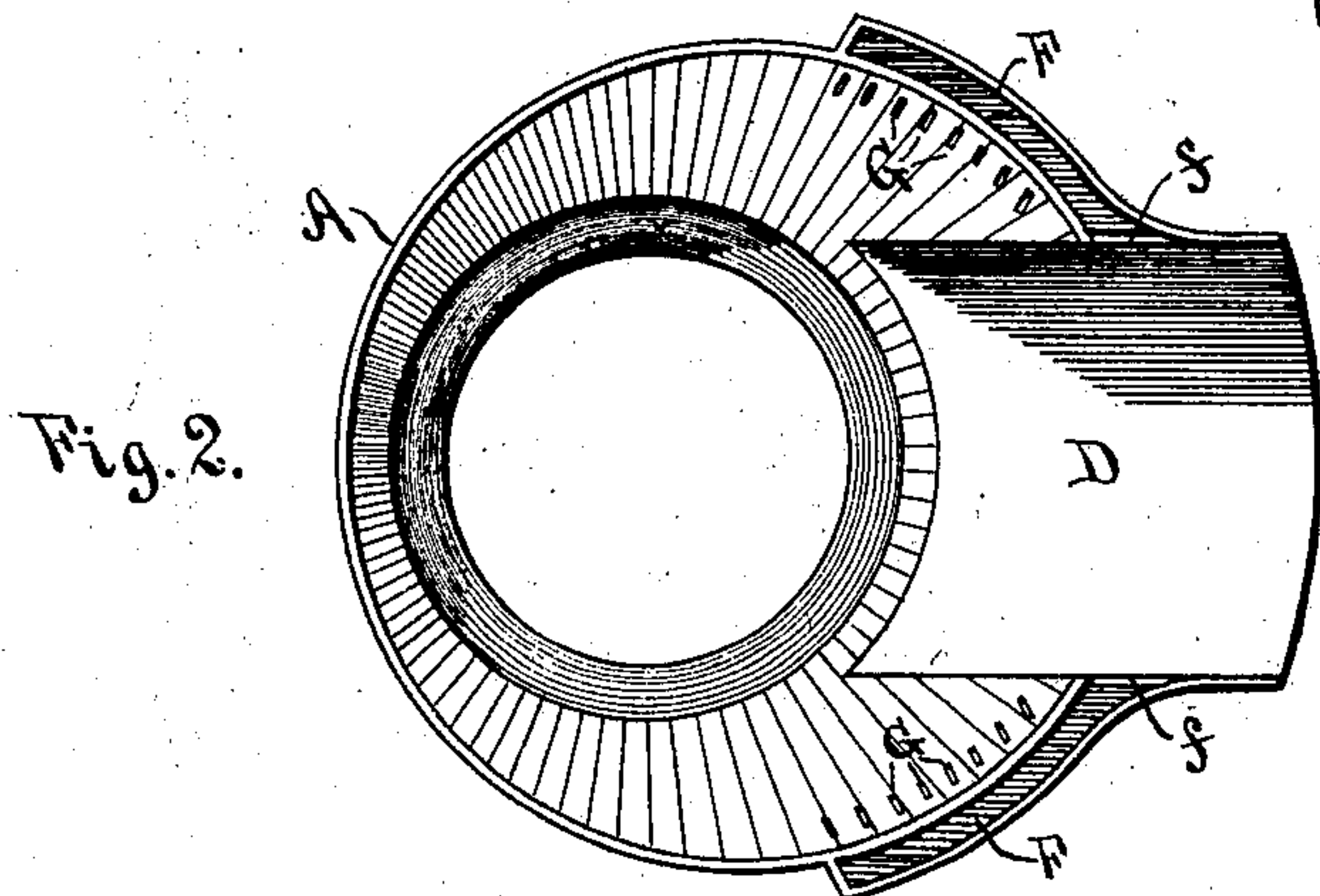


Fig. 3.

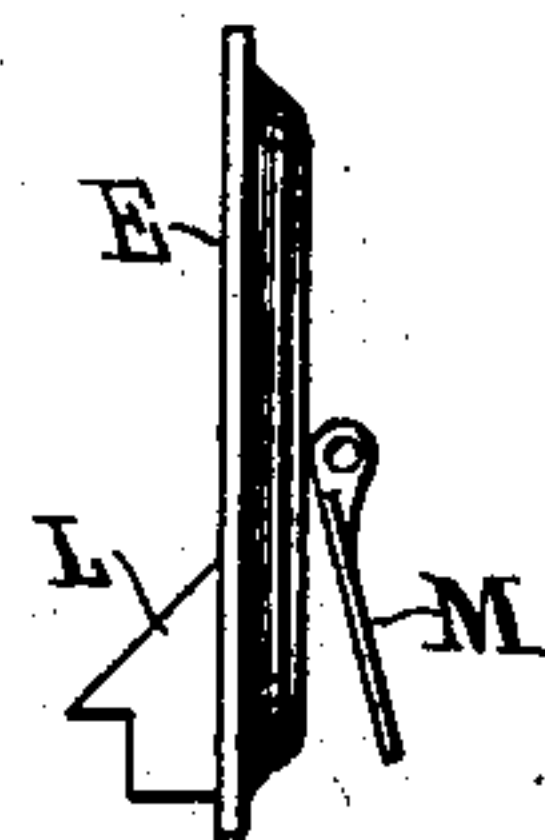
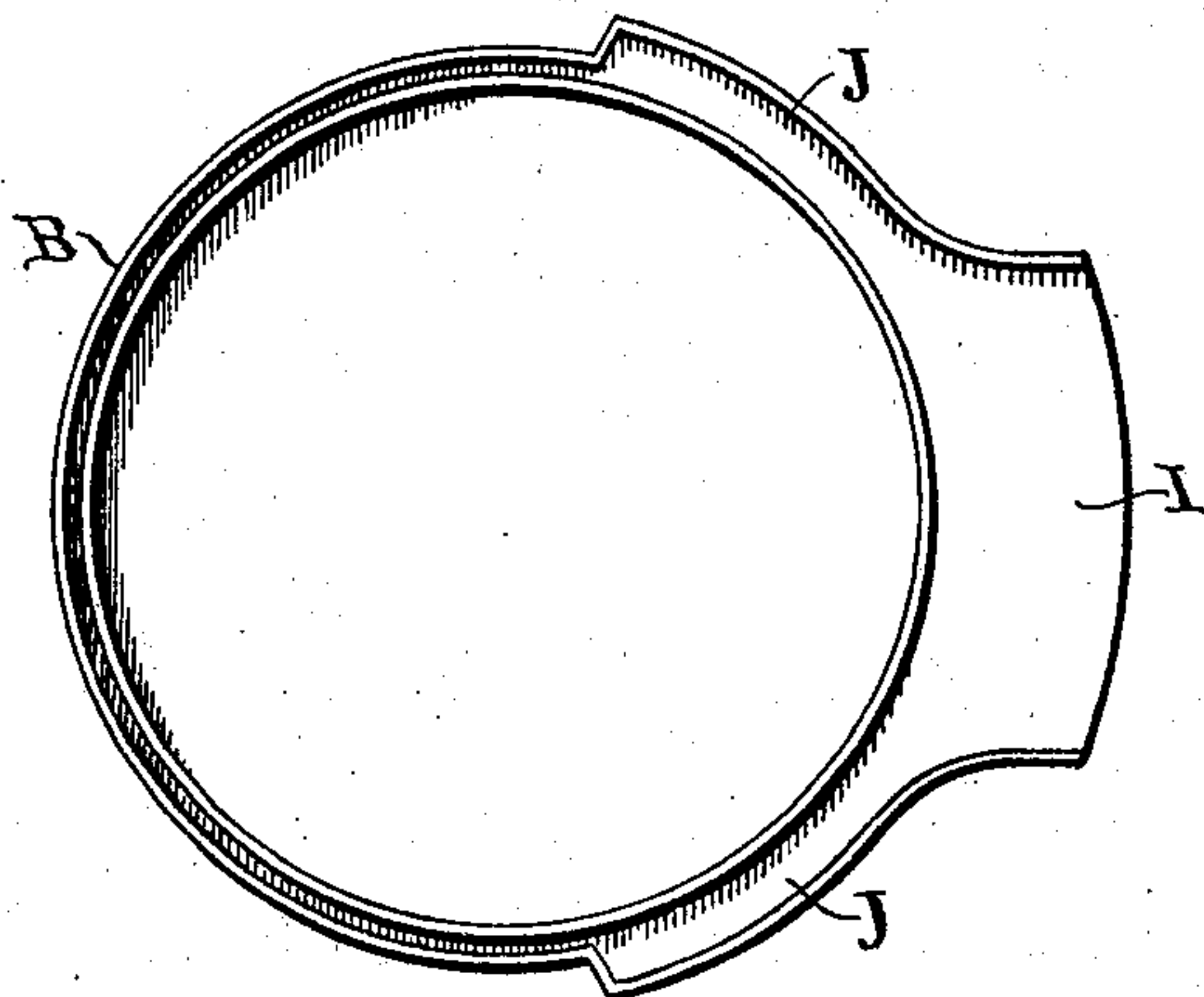


Fig. 5.

WITNESSES:

*A. B. Diven*  
*Louis Diven*

INVENTOR

*Cyrus S. Hood*

BY

*Eugene Diven*  
ATTORNEY



## UNITED STATES PATENT OFFICE.

CYRUS S. HOOD, OF CORNING, NEW YORK.

## SOFT-COAL FURNACE.

SPECIFICATION forming part of Letters Patent No. 746,084, dated December 8, 1903.

Application filed February 12, 1903. Serial No. 143,024. (No model.)

*To all whom it may concern:*

Be it known that I, CYRUS S. HOOD, a citizen of the United States, residing at Corning, in the county of Steuben and State of New York, have invented a new and useful Improvement in Soft-Coal Furnaces, of which the following is a specification.

This invention relates to improvements in heating-furnaces in which soft coal is to be used as fuel and wherein provision is made for delivering heated air over the fire in such manner as to secure a more perfect combustion of the smoke and gases arising from the fuel. Heretofore different arrangements and constructions of the furnace parts have been devised for accomplishing this purpose, but with only a limited degree of success. The cause of failure seems to be in a lack of heating the air (that is to be discharged at the surface of the fire) hot enough at all times to insure a perfect combustion. When the drafts are on, many of the methods for heating the air have been fairly successful; but as soon as the draft is closed the surfaces of the air-heating chamber cool so much that the air-blast for burning the smoke and gases fails to half do the work. Furthermore, I believe the air has been admitted to the surface of the fire through too large openings.

It is my object to provide certain improvements in the structural parts of a furnace of this type wherein the necessary air-ducts will be formed in casting the dome and fire-pot sections with the use of a minimum number of parts, and, further, to so form these air-ducts that the air will be delivered or sprayed over the top of the fire through narrow openings or ports after having first been brought to a temperature hot enough at all times to insure perfect combustion.

I accomplish my object by means of the arrangement and construction of the several parts of the furnace as illustrated in the accompanying drawings, in which—

Figure 1 represents a vertical transverse section through the dome and fire-box sections of a heater embodying my improvements; Fig. 2, a plan view of the bottom of the dome; Fig. 3, a plan view of the top of the upper fire-box section, and Figs. 4 and 5 details showing the parts which form the air-inlet ducts.

Like letters refer to like parts in the several views.

A represents a cast-iron dome, the bottom rim of which rests upon a groove formed at the top of section B of the fire-box, which in turn rests upon and is jointed into section C, which rests upon the grate-supporting base. (Not shown.) At the front of the furnace the dome A is provided with a projection D, which extends to the outside of the furnace-casing and forms the feed-opening. This opening is closed by a door E in the usual manner. At the bottom of the dome, at each side of the opening D, I form in casting the pockets F F, which extend around the sides of the dome a greater or less distance, as may be desired, and opening from these pockets to the interior of the dome are a series of narrow vertical slots G. The section B of the fire-box is provided with corresponding offsets J J and I, flanged around the outside and forming the bottoms for the pockets F and the feed-opening D. A false bottom is formed in the opening D by means of the plate H, which is formed in the shape shown in Figs. 1 and 4 and provided with a depending flange at the back, which forms a wall for the air-duct at the front of the fire-box. The front end of this plate is supported upon feet or lugs h h. The door E is provided with an inwardly-projecting hood or chamber L, the inclined roof of which laps over the top of the plate H. A damper M is arranged to regulate the passage of air through the door into this hood L and thence to the duct under plate H. The air from this duct passes by way of the openings f f into the pockets F and from these pockets is sprayed in fine jets from the narrow slots G over the fire. The pockets lie close to the walls of the dome and fire-box and receive heat directly therefrom. They do not in any way obstruct the passage of the air through the heater, nor do they present any cooling-surfaces to this air.

The air after entering the hood or chamber on the feed-door, where it begins to heat, is carried into the duct formed between the fire-box projection I and plate H, where it is further heated, and thence it passes through the openings f into the pockets F, the walls of which are formed by the fire-box and the cast dome, where it receives the final heating.



As these surfaces must always be very hot, whether the draft is on or off, the air after passing into these pockets must receive a high degree of heat, and there is therefore insured  
 5 at all times a highly-heated air-blast over the fire. As the slots G are narrow, the air is forced to pass through in fine streams, thereby giving it time to become thoroughly heated. If desired, the offsets J and I in the fire-box  
 10 section may be set lower down on the sides, thereby presenting a larger heating-surface for the air-feed.

By this construction the air-flues are readily formed in casting the parts, the number of  
 15 parts is reduced to a minimum, and the air in passing through the ducts is effectively heated to the desired degree of temperature.

Having thus described my improvements, what I claim as my invention, and desire to  
 20 secure by Letters Patent, is—

1. In a furnace, the combination of a dome having a feed-opening extending to the outer casing with pockets leading from each side  
 25 thereof around the lower portion of the dome, all of said parts being cast in one piece, a fire-box section having flanged offsets to form the bottom of said feed-opening and pockets, a removable false bottom in said feed-opening forming an air-duct leading to said pockets,  
 30 means for admitting air thereto, and openings or ports leading from the pockets to the combustion-chamber within the dome.

2. In a furnace, the combination of a dome having a feed-opening extending to the outer

casing with pockets leading from each side  
 35 thereof part way around the lower portion of the dome, all of said parts being cast in one piece, a fire-box section having flanged offsets to form the bottom of said feed-openings and pockets, a false bottom in said feed-open-  
 40 ing forming an air-duct leading to said pockets, means for admitting air thereto, and a series of narrow slits or ports leading from each of the pockets to the combustion-chamber within the dome. 45

3. In a furnace, the combination of a dome having a feed-opening extending to the outer casing with pockets leading from each side  
 50 thereof around the lower portion of the dome, a series of openings or ducts leading from said pockets to the combustion-chamber within the dome, a fire-box section having flanged offsets to receive the dome and form the bottom of said feed-opening and pockets, a false  
 55 bottom in the feed-opening forming an air-duct leading to said pockets, a door to close the feed-opening, an inwardly-projecting chamber or hood on the door opening into the false bottom when the door is closed, and a  
 60 damper to regulate the passage of air into said chamber.

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

CYRUS S. HOOD.

Witnesses:

F. C. WILLIAMS,  
 GEORGE HITCHCOCK.