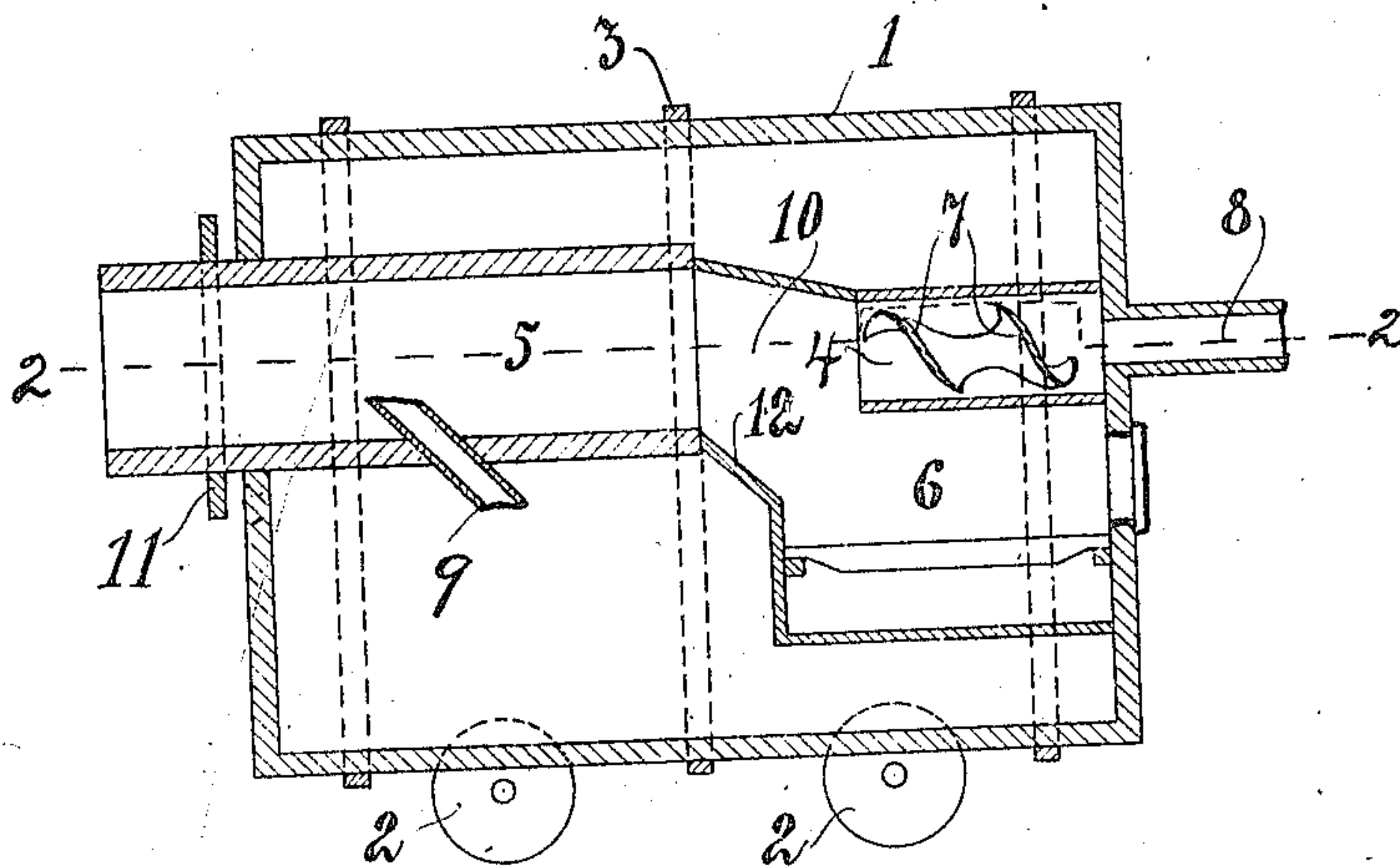


N. K. H. EKELUND.  
IGNITING FURNACE FOR PULVEROUS FUEL.  
APPLICATION FILED SEPT. 12, 1907.

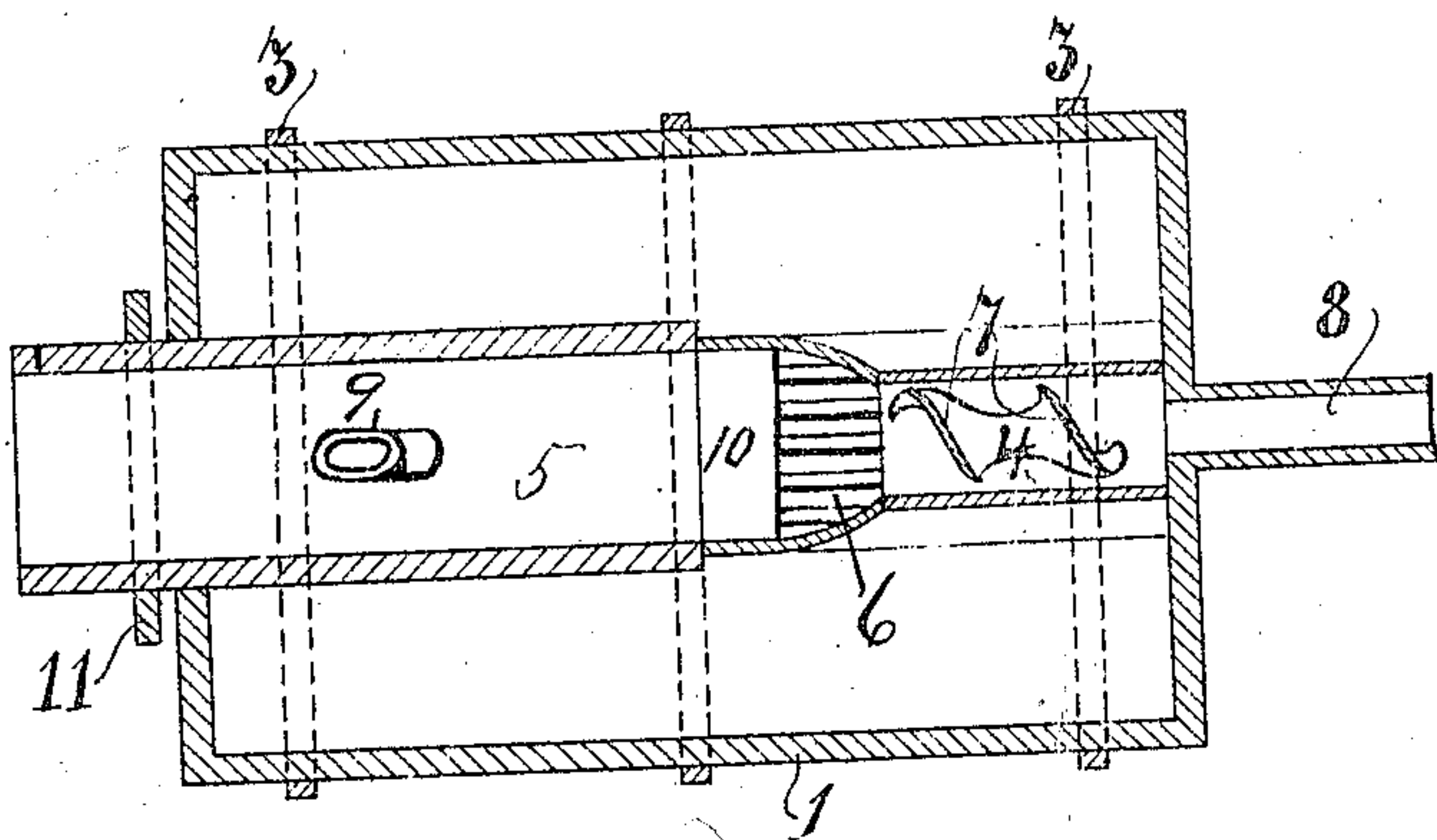
960,292.

Patented June 7, 1910.

*Fig. 1.*



*Fig. 2.*



Witnesses:

E. M. Bond  
C. M. Boulter.

Inventor:

Nils K. H. Ekelund

By

E. M. Bond

Attorney



# UNITED STATES PATENT OFFICE.

NILS KARL HERMAN EKELOUND, OF JÖNKÖPING, SWEDEN.

## IGNITING-FURNACE FOR PULVEROUS FUEL.

960,292.

Specification of Letters Patent.

Patented June 7, 1910.

Application filed September 12, 1907. Serial No. 392,605.

*To all whom it may concern:*

Be it known that I, NILS KARL HERMAN EKELOUND, a subject of the King of Sweden, and resident of Östra Storgatan 13, Jönköping, in the Kingdom of Sweden, have invented certain new and useful Improvements in Igniting-Furnaces for Pulverous Fuel, of which the following is a specification, reference being had therein to the accompanying drawing.

There is no doubt that the pulverous form is the most convenient one for solid fuel, by reason of the fact that the said form affords the opportunity of a combustion under the most favorable conditions. Experience has, however, proved that certain practical difficulties are to be overcome if one shall be able to utilize the theoretical possibilities which are involved when firing with pulverous fuel. The principal condition for reaching a good result is of course to have a perfectly suitable fuel which is inflammable and easily combustible, but certain measures are also required, especially as to the ignition. There are, even in the best fuel, certain particles, which ignite with difficulty and some grains have a tendency to fall down unburned. This fact has hitherto been too little considered, and, therefore, the difficulties attached to the above method of firing have not been overcome.

The present invention has for its object an igniting-furnace which admits of a perfectly rational firing with pulverous fuel.

Referring to the accompanying drawing, Figure 1 is a vertical section through a furnace according to the present invention, and Fig. 2 is a horizontal section through the same on line 2-2 of Fig. 1.

The furnace consists of a box 1 supported on wheels 2, the sides of the said box being held together by means of iron rods 3. The box is divided into three compartments, viz. the mixing compartment 4, the igniting compartment 5 and the fire-place 6. The mixing compartment consists of a tube which is attached to the exterior end of the box and is inwardly provided with screw-like screens 7. A tube 8, coming from a pressure-fan or similar device, supplying air and pulverous fuel, opens into the tube 4 from outside. The igniting compartment 5 consists of a tube wider than the tube 4 and provided with an internal casing of fireproof material. The tube 5 is suitably aligned with the tube 4 but is located at some distance from the

latter so that there is an intermediate space between the two adjacent ends of the tubes.

The tube 5 extends some distance out of the box and is surrounded by a gasket 11. An air-supplying tube 9, having a forwardly inclined position, is inserted into the tube 5. The fire-place 6, which is in the ordinary manner provided with grate and door, is located under the tube 4 and its fire channel 10 consists of the above mentioned intermediate space between the tubes 4 and 5. The inclined bottom 12 of the channel 10 forms at the same time the fire-bridge of the fire-place 6. The tube 5 forms a common outlet for the compartment 4 and the fire-place 6.

The mode of operation of the furnace is as follows: Supposing a steam-boiler is to be fired, the igniting furnace is brought close to the boiler so that the tube 5 enters through the fireplace opening into the fireplace. The gasket 11 serves to secure a tight joint around the tube at the said opening. The fireplace is fired and the fan is started. The pulverous fuel and air are now introduced into the compartment 4 where they are given a rotating movement by the screen 7 and thereby they are mixed with one another and simultaneously heated from the fireplace 6. The rotating movement contributes to hold the particles suspended in the air. When the air containing pulverous fuel comes out of the compartment 4 it meets in the channel 10 with the flame from the fire-place 6 and is thereby ignited. The grains which may be too heavy to be held suspended in the rotating air fall down upon the bridge 12 inclined toward the fireplace 6 and are burned or slide down into the fireplace. In the channel 10 the first gasifying of the fuel takes place but the fuel must also be exposed to favorable igniting conditions for some moments. For this purpose the fuel is forced by pressure and draft into the igniting tube 5, the walls of which will rapidly become red-hot by the action of the hot gases. Here an additional quantity of air is introduced through the tube 9. In the present case there is always plenty of air for the first ignition thereby enabling a high temperature to be obtained, which will promote further gasifying. For this purpose, however, an additional supply of air in the tube 5 is also required. As this quantity of air is introduced from the bottom tube 9 (by pressure or draft) it also



contributes to hold the pulverous fuel suspended till the complete combustion has taken place. If one desires to obtain a very long flame the said quantity of air may be supplied at several points farther in in the fireplace.

The fireplace, however, has also another application. If the supply of pulverous fuel should at any time be interrupted but the supply of air be not shut off, the igniting compartment would be cooled, thus rendering a further ignition more difficult. In the present case such cooling is prevented and the supply of fuel may be increased, reduced or interrupted. Thus the fireplace in several respects acts like a regulator without which the firing with pulverous fuel can never be executed practically to the greatest degree.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In igniting furnaces for pulverous fuel, a portable box, a tube in the said box, forming the mixing compartment, means for introducing air and pulverous fuel into the said compartment, an igniting tube in the prolongation of the mixing tube and placed

at some distance from the latter so as to form an intermediate space between them, means for supplying air to the igniting tube, and a fireplace located under the mixing tube, substantially as and for the purpose described.

2. In igniting furnaces for pulverous fuel, a box supported by wheels, a mixing tube in the said box, means for supplying air and pulverous fuel to the said mixing tube, means for causing the air and pulverous fuel to rotate within the mixing tube, an igniting tube reaching some distance out of the box and placed in the prolongation of the mixing tube and at some distance from the latter, so as to form an intermediate space between the tubes, means for supplying air to the igniting tube, a fireplace under the mixing tube and a firebridge between the fireplace and the igniting tube, substantially as described.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

NILS KARL HERMAN EKELUND.

Witnesses:

G. FREDÉN,  
J. RASMUSSEN.