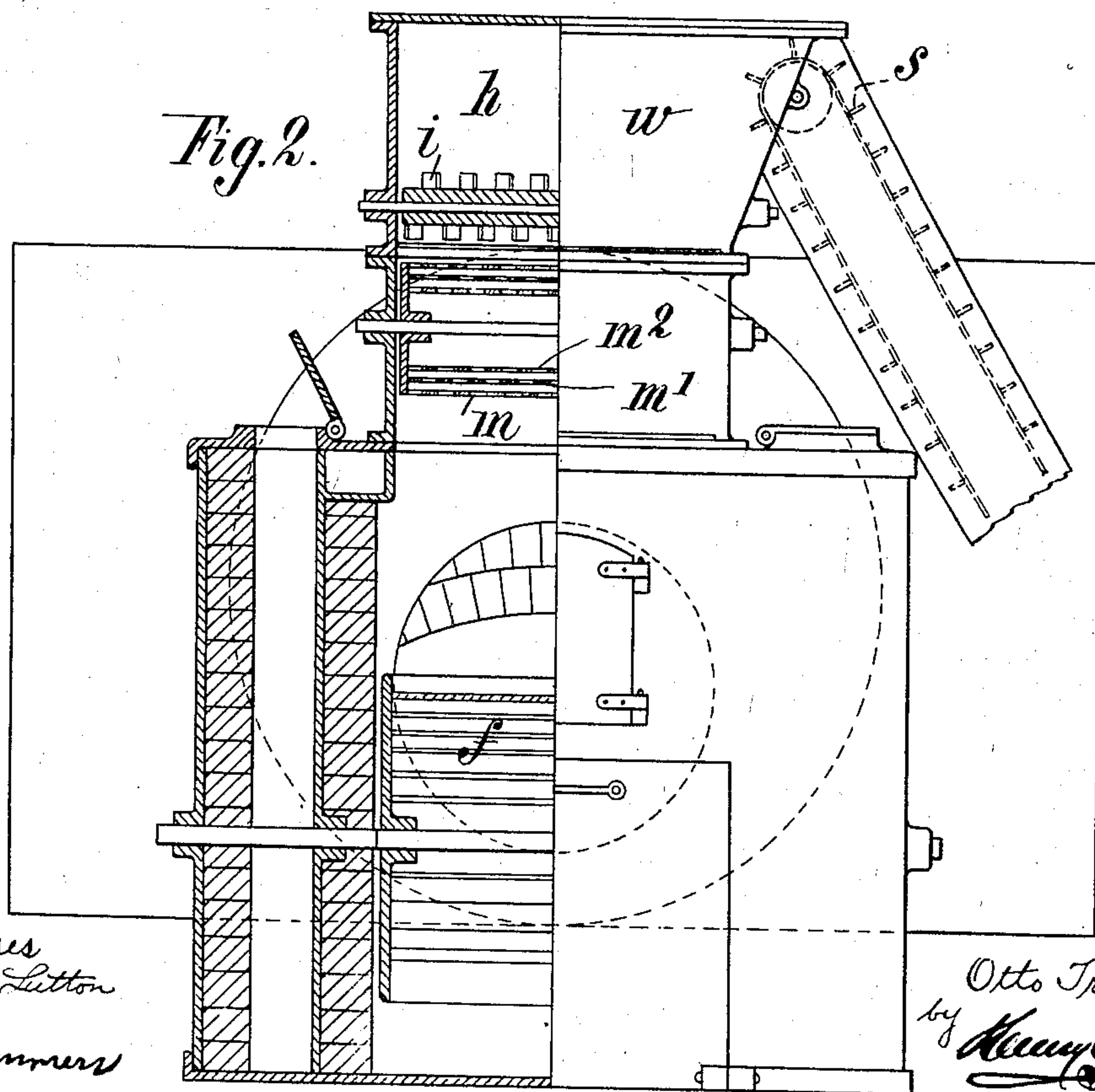
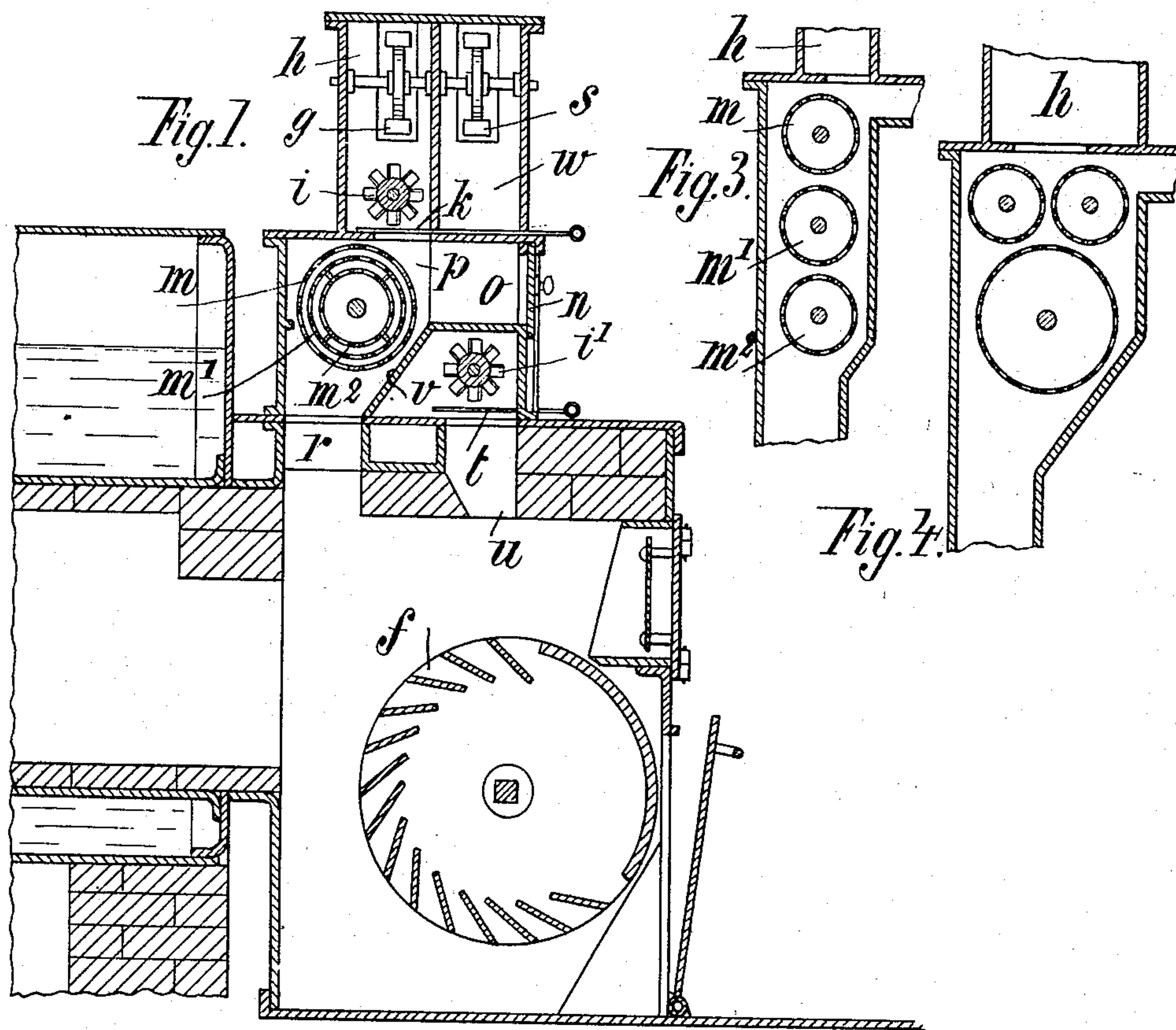


No. 863,239.

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O. TROSSIN.
FURNACE.

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FURNACE.

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To all whom it may concern:

Be it known that I, OTTO TROSSIN, a subject of the German Emperor, and a resident of Hamburg, in the German Empire, have invented a certain new and useful Improvement in Furnaces, of which the following is a specification.

The present invention relates to a furnace, in which coal dust is employed as fuel.

The furnaces of this kind known heretofore have not fulfilled the expectations, which were set in the same. The reason of this is that heretofore it was found impossible to distribute the coal-dust minutely to a sufficient degree and therefore to obtain a thorough and even mixture of the dust and air. It has been tried to introduce the coal dust into the air by means of perforated drums, through which a stream of air passes longitudinally and which the coal dust enters radially by way of the perforations. However by these means the air carries the dust into the furnace in small lumps and thus the efficiency is greatly reduced. It has also been tried to distribute the coal dust in the stream of air by means of rotating brushes. However it has been found that these brushes clog and finally revolve in the mass of coal dust like a solid cylinder without feeding the dust at all.

The present invention does away with all these drawbacks, by providing rotating perforated drums through which are passed a stream of air and coal dust, preferably in such a manner that a repeated distribution takes place. One portion of the air and also the coal dust introduced in the same is led round about the drum, whereby a distribution takes place by the large number of edges created by the openings and the rest passes from outside to the inside of the drum and from the inside to the outside, and when thus passed mixes again with the portion led about the drum.

In Figure 1 of the drawing a furnace is shown in sectional elevation. Fig. 2 shows the furnace one half in front elevation and one half in section. Figs. 3 and 4 show modifications in which the distribution drums are differently arranged.

The coal-dust is carried into a hopper *h* arranged above the furnace by an elevator *g*. From the hopper the coal dust passes a stirrer or an agitator *i* and a hit and miss grate *k* and enters the chamber *p*, into which at the same time air is introduced by the adjustable slide or movable door *n* and the channel *o*. Inside the chamber *p* the perforated distributing drums *m* are arranged to rotate. The coaldust dropping down from above is partly led about the drum and partly forced through the perforations thereof by the entering air.

That portion of the coal-dust which is led around the drum experiences a disintegration by the large number of edges formed by the perforations and at the

same time it is forced down between the drum and the oblique wall *v* of the chamber thus being subjected to a pressure, from which it is released, when the narrow space is passed, so that there is an expansion, which assists in distributing the coal-dust in the air. Therefore a good mixture is obtained hereby. The remaining portion of the coal dust, which enters the drum together with the air through the apertures, is also compressed in passing the same and expands inside of the drum, so that the dust, even wherever it is still in lumps in passing the openings is driven asunder by the expansion of the air and thus is finely distributed. The operation is repeated, when the dust enters the other drums *m*¹ and *m*² arranged concentrically within the drum *m* and also when it leaves the drums on the opposite side, where again expansions take place. The distribution is still enhanced by the stream of air saturated with coal dust running round the drum *m* mixing with that portion forcing its way through the drum. Thus a real dust cloud is created, the composition of which is most favorable for a complete combustion. This dust-cloud is led preferably by way of a cooled channel *r* to the furnace, where it meets with burning gases on which it also catches fire. The coal dust is then completely burnt at such a high temperature that no smoke can be formed.

Besides the feeding device for the coal-dust, there is also one for small-coal, smudge-coal, culm or the like which is fed to the hopper *w* by the elevator *s*. There is also a stirrer *t*¹ for this coal, which distributes it on the regulating slide *t*, through the opening of which, it falls through the feeding channel *u* down on the grate *f*.

Instead of being arranged concentrically within one another the drums *m*, *m*¹ and *m*² may be arranged side by side or one below the other as shown in Fig. 3. The modification shown in Fig. 4, in which two smaller drums are arranged above a larger one appears to give the best results. The two smaller drums rotate in opposite direction to each other so as to exert a pressure on the mixture of air and coal dust when the latter falls in between the same. The operation in other respects is the same as described above, with reference to Fig. 1.

Since the heat gained by the coal dust is extremely high the wall of the flue must be lined with incombustible bricks.

I claim.

1. In a fuel-feeding device, a receiving chamber, a perforated rotatable member mounted therein, means to direct a current of air onto the perforated member from the outside thereof and means to feed a pulverulent material into the path of the air-current whereby a portion of the material is carried into the rotatable member.

2. In a fuel-feeding device, a receiving chamber, a plurality of perforated rotatable members mounted therein, means to inject a current of air onto the rotatable mem-

bers from the outside thereof, and means to drop a pulverulent material onto the latter and in the path of the current whereby the material is carried into the rotatable members, and around the same.

- 5 3. In a fuel-feeding device, the combination with a furnace having a feed-channel, of a receiving chamber communicating with the channel and having a dust inlet, an air inlet to the chamber, and a plurality of perforated drums rotatably mounted in the chamber near the air inlet and
10 between the dust inlet and feed-channel.

4. In a fuel-feeding device, the combination with a furnace having a feed channel, of a receiving chamber mounted above the furnace communicating with the channel and having a dust inlet in its top, an air channel leading into
15 the chamber transversely to and above the feed-channel, and a perforated drum rotatably mounted in the chamber near the mouth of the air channel and between the inlet and feed channel.

5. In a fuel-feeding device, the combination with a furnace having a feed-channel in its top, of a receiving chamber communicating with the channel having a dust-inlet
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in its top, an air-channel leading into the chamber transversely to and above the feed-channel, a perforated drum rotatably mounted in the chamber near the mouth of the air-channel and between the inlet and feed-channel, and an inclined wall forming a narrow passage between it and the drum. 25

6. In a fuel-feeding device, the combination with a furnace having a feed-channel in its top, of a receiving chamber communicating with the channel, a dust-hopper communicating with the receiving chamber through a dust-inlet, a stirrer over the latter, an air-channel leading into the chamber transversely to and above the feed-channel, a plurality of perforated drums rotatably mounted in the chamber between the dust-inlet and feed-channel, an incline in the chamber leading from one of the drums to the feed-channel, and a coal-hopper communicating with the furnace through a separate feed-channel. 30 35

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Witnesses:

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