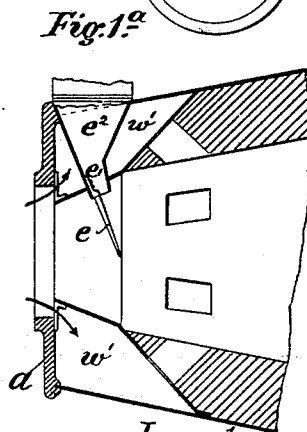
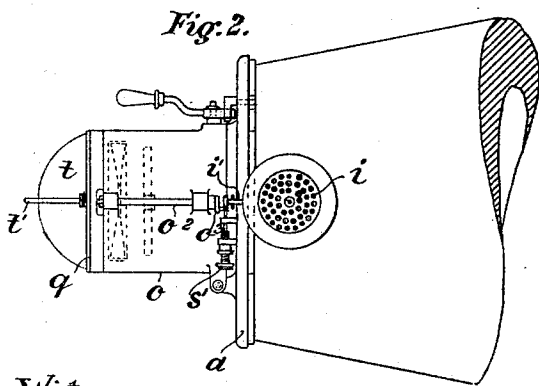
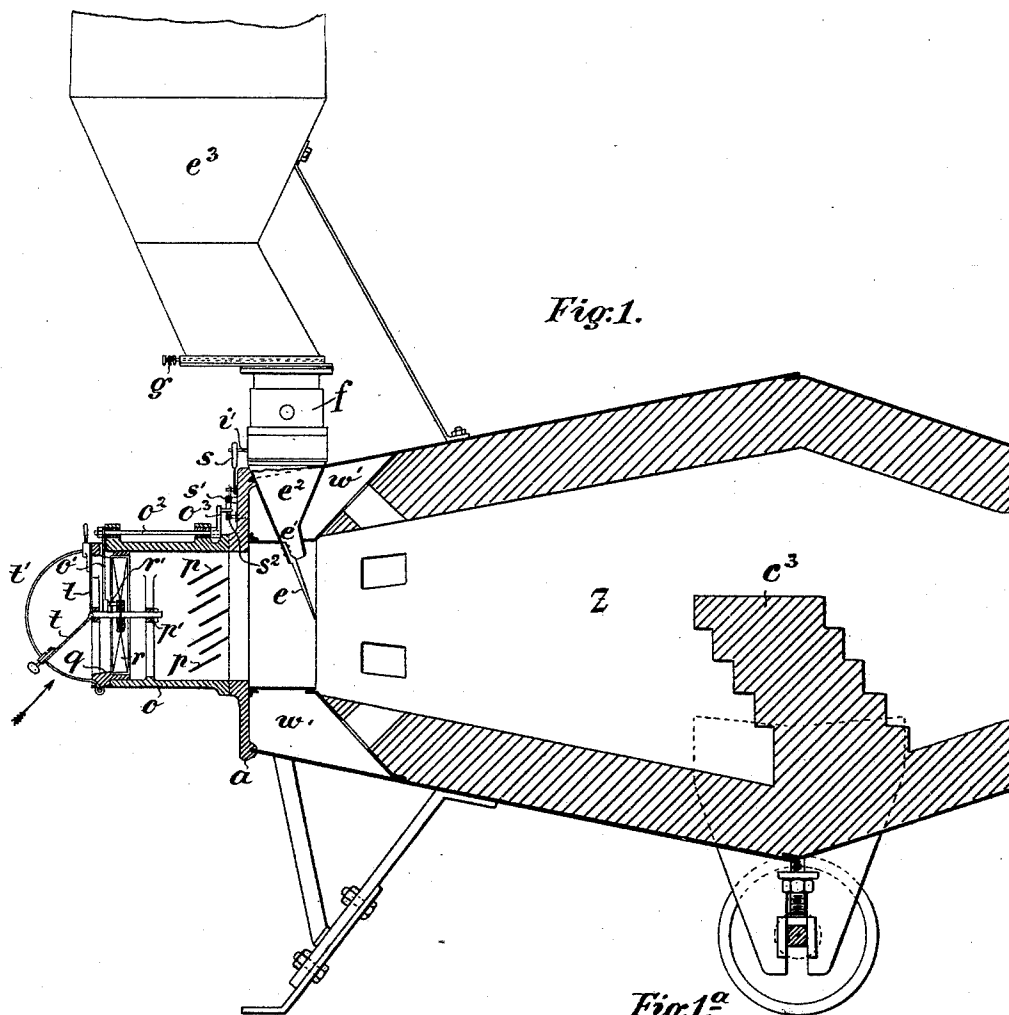


C. WEGENER.
COAL DUST FIRING APPARATUS.

No. 519,784.

Patented May 15, 1894.



Witnesses:
Chas E. Riordon
Wm D. Crowell

Inventor:
Carl Wegener
By Butterworth & Dowell
his attys

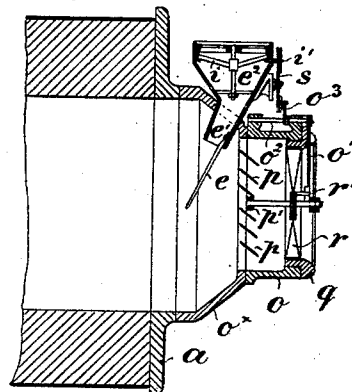
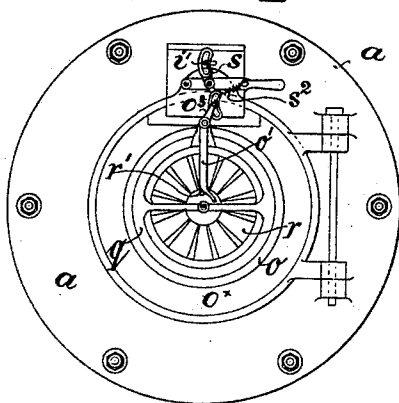
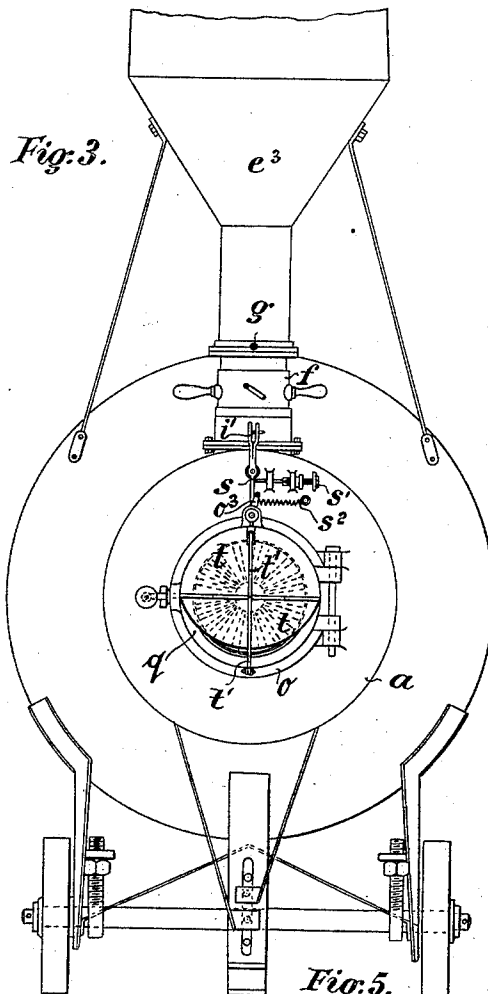
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4 Sheets—Sheet 2.

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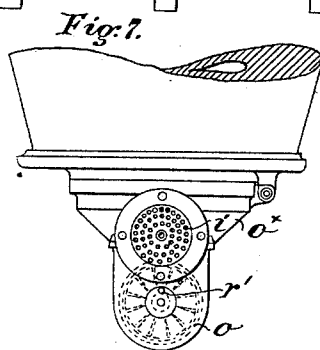
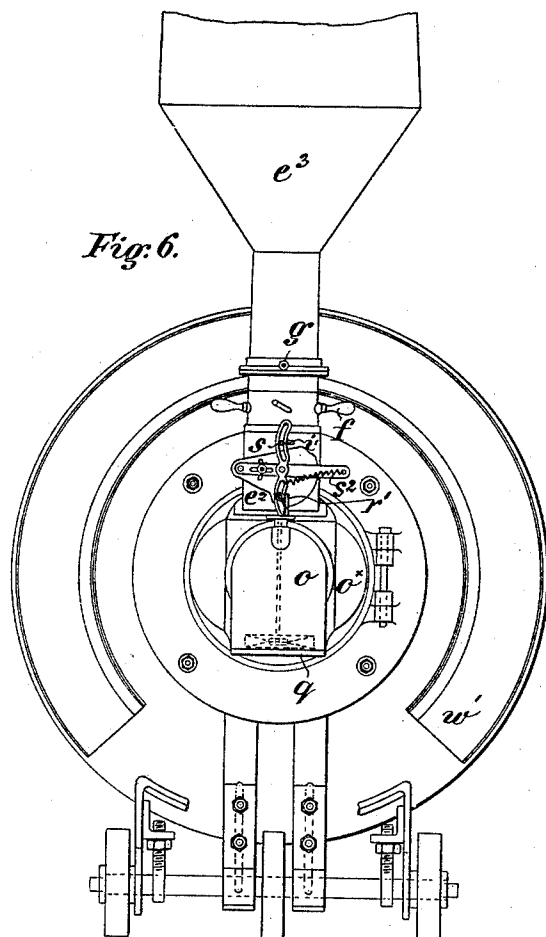
(No Model.)

4 Sheets—Sheet 3.

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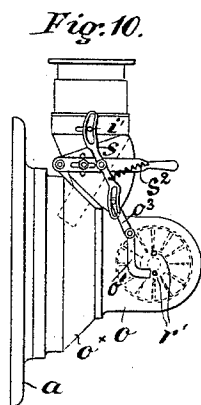
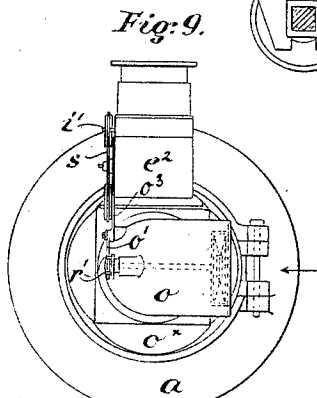
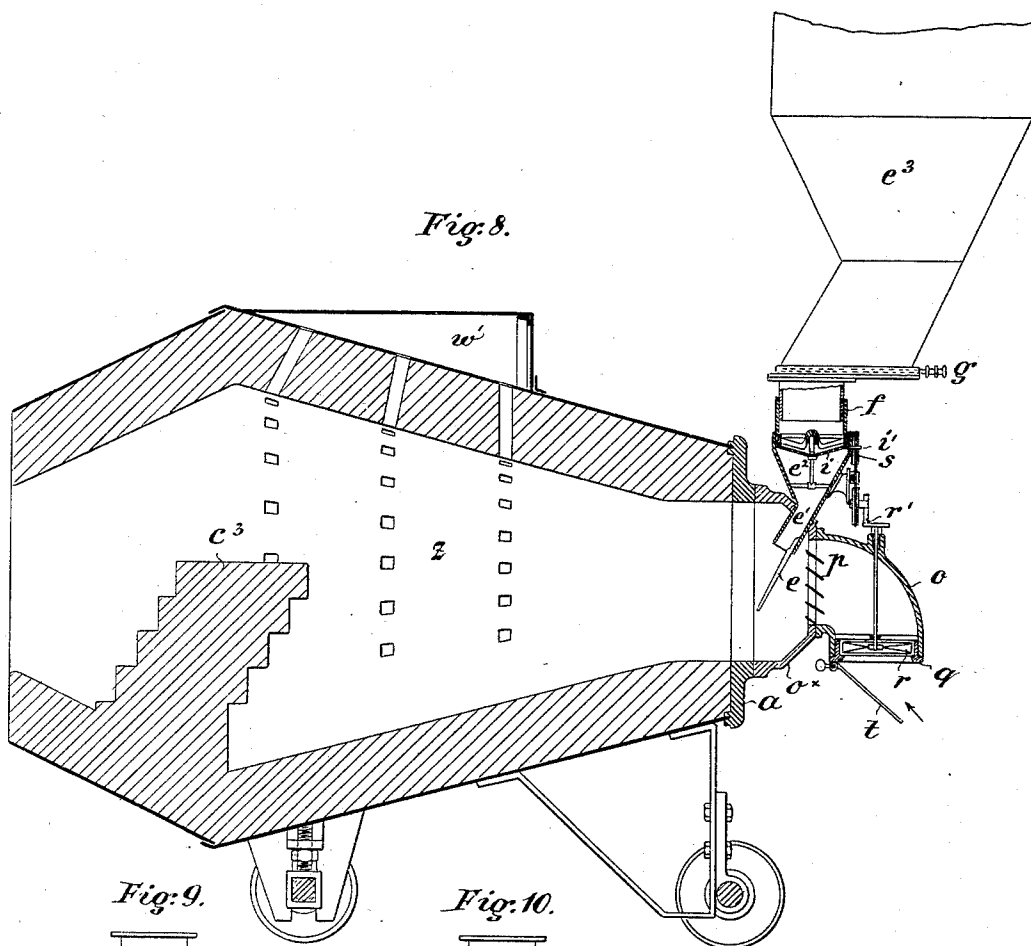
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4 Sheets—Sheet 4.

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No. 519,784.

Patented May 15, 1894.



Witnesses:

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Inventor:

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UNITED STATES PATENT OFFICE.

CARL WEGENER, OF BERLIN, GERMANY.

COAL-DUST-FIRING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 519,784, dated May 15, 1894.

Application filed October 12, 1893. Serial No. 487,977. (No model.) Patented in France April 26, 1893, No. 218,265; in Belgium May 5, 1893, No. 104,531; in Italy May 15, 1893, LXVI, 485, and in Luxemburg August 29, 1893, No. 1,882.

To all whom it may concern:

Be it known that I, CARL WEGENER, a subject of the King of Prussia, residing at Berlin, in the Kingdom of Prussia, German Empire, have invented a new and useful Coal-Dust-Firing Apparatus, (for which I have obtained patents in Belgium, No. 104,531, bearing date May 5, 1893; in France, No. 218,265, bearing date April 26, 1893; in Italy, Vol. LXVI, No. 485, bearing date May 15, 1893, and in Luxemburg, No. 1,882, bearing date August 29, 1893,) of which the following is a specification.

This invention consists in a new method of feeding a furnace for fine fuel such as has been described in the Patent No. 475,715, and it consists further in the means, by which furnaces of this kind are fed in the new manner.

The invention dispenses with the usually applied artificial blast of air or steam for carrying the fine fuel into the combustion chamber by making use for this purpose of a current of air of atmospherical pressure drawn into the combustion chamber by the natural draft of the chimney.

The invention will now be fully described with the aid of the accompanying four sheets of drawings.

Figures 1 to 3 show the new "natural" fuel feed in its application to a front furnace as described in the aforesaid prior Patent No. 475,715. Fig. 1 represents a vertical longitudinal section of the furnace and Fig. 1^a a vertical longitudinal section of a modified part of this furnace. Fig. 2 represents a plan and Fig. 3 a front view of the same furnace. Figs. 4 and 5 show the invention in its application to a furnace arranged within or underneath the boiler, Fig. 4 representing a front view and Fig. 5 a vertical longitudinal section of the arrangement. Figs. 6 to 8 show a modification of the new fuel feed applied to a front furnace. Fig. 6 represents a front view, Fig. 7 a plan and Fig. 8 a vertical longitudinal section of the furnace. Fig. 9 represents a front view and Fig. 10 a side view of another modification of the natural fuel feed applicable to both kinds of furnace arrangements.

The combustion chamber *z* shown in Fig. 1 in longitudinal vertical section differs only

from the one described in the aforementioned Patent No. 475,715 in that the fire bridge *c*³ in the present instance is built into the walls. Above the front of the furnace the hopper *e*³ is arranged, which at its lower end is provided with a cut-off valve *g* and connected by a sleeve *f* with the disintegrating and supplying sieve *i* (Fig. 2) rocked to and fro on its vertical axis by means of its stud *i'*. The coal dust falling down through the oscillating sieve passes through the funnel *e*² and the sloping channel *e'* into the comb-like arranged open gutters *e*, which penetrate the entrance to the combustion chamber behind the front plate *a*. There is a small circular wall or mouthpiece *o* secured to the front plate and presenting on its rear end a number of superposed and upwardly sloping plates *p*. These impart an upward motion to the current of air which is drawn in from the chimney through the mouth piece *o*, so that it takes up the coal dust from the gutters *e* and carries the same so much farther into the almost horizontal combustion chamber *z*.

In order that the swinging motion of the grating or sieve *i'* may be produced without the aid of an extraneous motor, a fan wheel *r* is inserted with its framework *g* into the mouthpiece *o* and is further supported at *p'* in the latter. When the framework or ring *g* is taken out, the fan wheel can be easily removed. For converting the rotary motion of the fan into the swinging motion of the sieve plate *i*, the nave of the wheel *r* is provided with a stud *r'*, which, by means of a system of levers *o'*, *o*², *o*³ *s* engaging the peg or stud *i'* of the sieve plate *i*, sets the sieve in motion in the one direction, while its return motion, the extent of which can be regulated by screw *s'*, is brought about by the spring *s*², Fig. 3. The regulation of the amount of air to be introduced is effected by two semi-circular dampers *t* which are fitted to the front of the ring *g* and can be secured at any desired angle of opening by means of the crown or stirrup *t'*. In the arrangement of the parts shown in Fig. 1, it is supposed that only a portion of the air requisite for supporting the combustion passes the fan and the mouthpiece *o*, as the circular space *w'* receives the air through openings in its exterior wall not shown in the

drawings. In Fig. 1^a on the contrary it is supposed that the entire amount of air passes through the fan *r*, mouthpiece *o* and plates *p* and is then divided to pass partly through the gutters *e* and partly as indicated by the arrows through the circular air chamber *w*' into the furnace.

In the form of the invention shown in Figs. 4 and 5 the mouthpiece *o* is fitted to a doorway *o*^x which bears the coal dust funnel *e*^x with its allied parts *e'* *e*, and which doorway *o*^x is adapted to the furnace front *a* closing the flue. The motion of the sieve plate *i* is brought about by means of a spring and system of levers similar to that shown in Figs. 1 to 3.

The form of apparatus shown in Figs. 6 to 8 has also the above described arrangement of coal dust funnel on a doorway *o*^x fitted between the furnace front *a* and the mouthpiece *o* which in this case is curved round so that the fan *r* lies in the horizontal plane. The axis of the fan will therefore pass up vertically through the wall of the curved mouthpiece *o* and has an eccentric peg or pin *r'* at its upper end which again in conjunction with a spring and a system of levers imparts a to and fro motion to the sieve plate *i*. Since the entire parts are seated on the furnace front *a*, this furnace front can be just as well applied to the door frame of a furnace arranged within the boiler as of one arranged underneath or, as shown in the drawings, before the same.

The arrangement shown in Figs. 9 and 10 is also applicable to all three cases since it differs from the foregoing one only in the horizontal position of the curved mouth-piece *o* and in the disposition of the levers for driving the sieve plate.

In order to kindle the fire in the coal dust furnace, a small fire is first lighted in the combustion chamber, and the air is admitted in the mouthpiece *o* to move the wheel *r*. Thereby the coal dust is blown into the combustion chamber, the temperature of which in a few minutes attains the normal degree of heat requisite to insure perfect smokeless combustion.

What I claim is—

1. In a furnace for fine fuel, the combination with the combustion chamber, of a mouth-piece arranged adjacent thereto and provided with an opening for the admission of atmospheric air and with inclined ribs or bars for deflecting the air current in an upward di-

rection, means for feeding the fine fuel into the deflected air current, and a discharge funnel essentially as described.

2. In a furnace for fine fuel, the combination with the combustion chamber, of a mouth-piece arranged adjacent thereto, and provided with an opening for the admission of atmospheric air, and with inclined ribs or bars to direct the air currents, and a feed hopper provided with an automatically agitated sieve, and a discharge funnel, substantially as described.

3. In a furnace for fine fuel, the combination with the combustion chamber, of a mouth-piece arranged adjacent thereto and provided with an air opening controlled by a damper, a fan wheel arranged within said mouth-piece and revolved by the natural draft of the chimney, and a feed hopper, a discharge funnel, and a sieve interposed between said funnel and hopper, and mechanism for automatically agitating said sieve by the motion of the fan wheel, substantially as described.

4. In a furnace for fine fuel the combination with the combustion chamber and its door, of fuel feeding mechanism supported upon said door and comprising a hopper and disintegrating device, and a fan wheel exposed to the atmosphere to be revolved by the natural draft of the furnace, and mechanism operated by the revolution of said wheel to automatically operate the disintegrating device, substantially as described.

5. The combination in a furnace for fine fuel, of the combustion chamber, and fuel feeding mechanism consisting of a hopper arranged to discharge its contents into said combustion chamber, and a fan wheel exposed to the atmosphere to be revolved by the natural draft of the furnace, substantially as described.

6. In a furnace for fine fuel, the combination with the combustion chamber, of a mouth-piece arranged adjacent thereto and provided with an opening for the admission of atmospheric air, and with depending gutters and means for automatically feeding the fuel to the gutters and for conveying same to the combustion chamber, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CARL WEGENER.

Witnesses:

W. H. EDWARDS,
W. HAUPT.