Sept. 11, 1928. 1,684,320

E. HERMSDORF

APPARATUS FOR FEEDING POWDERED FUEL TO A FURNACE

Filed Oct. 11, 1924 2 Sheets-Sheet 1

Fig. 1

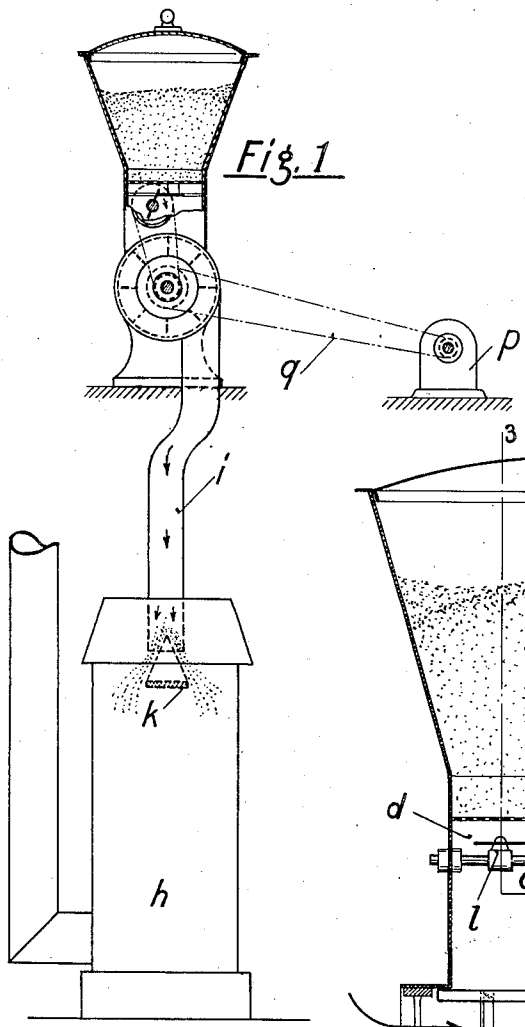
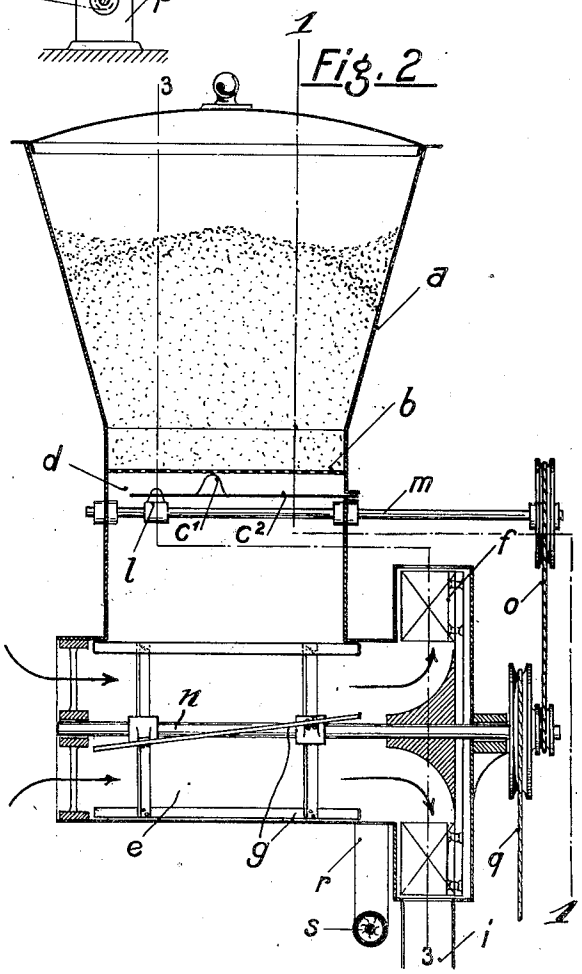


Fig. 2



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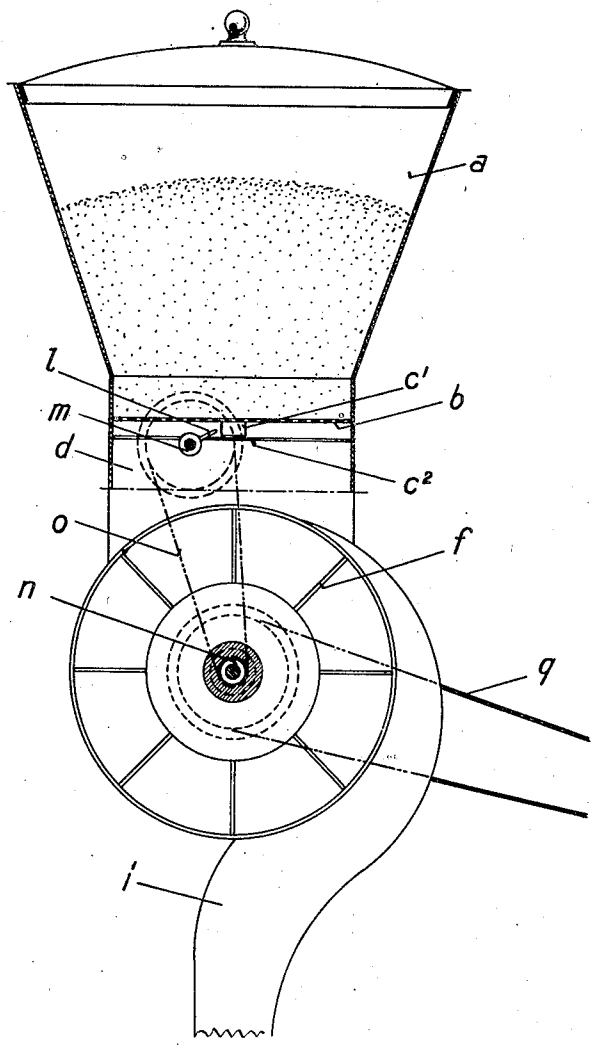
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Fig. 3



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UNITED STATES PATENT OFFICE.

EWALD HERMSDORF, OF BRUNSWICK, GERMANY.

APPARATUS FOR FEEDING POWDERED FUEL TO A FURNACE.

Application filed October 11, 1924, Serial No. 743,125, and in Germany October 17, 1923.

My invention relates to improvements in apparatus for feeding powdered fuel to a furnace. The object of the improvements is to provide an apparatus in which the fuel is uniformly distributed in the blast of air carrying the same to the furnace or stove, and with this object in view my invention consists in providing stirring means in the conduit of the said blast of air by means of which the powdered fuel falling into the conduit is whirled around, and any fuel which might fall to the bottom is raised and thrown into the blast of air.

For the purpose of explaining the invention an example embodying the same has been shown in the accompanying drawing in which the same reference characters have been used in all the views to indicate corresponding parts. In said drawing,

Fig. 1, is a view partly in section and partly in elevation along the line 1—1 of Fig. 2 showing a stove having the apparatus associated therewith,

Fig. 2, is a sectional elevation showing the fuel supplying apparatus on an enlarged scale, and

Fig. 3, is a section taken on the line 3—3 of Fig. 2.

In the figures I have shown the apparatus as used in connection with a stove. But I wish it to be understood that I do not limit myself to such use.

As shown the supplying apparatus comprises a receptacle *a* suitably mounted above the stove *h* and having a bottom *b* in the form of a sieve or foraminated plate fixed thereto, and a conduit *e* communicating with the bottom part of said receptacle and provided with a fan or blower *f* for producing a current of air therethrough, the delivery end of the fan or blower opening into a pipe or trunk carrying the air and the powdered fuel to the stove *h*. Below the discharge end of the pipe *i* there is a plate *k* adapted to deflect the current of air and powdered fuel for producing a short flame.

Below the bottom or sieve *b* there is a hammer adapted to impart short blows to the bottom or sieve for causing a gradual and uniform delivery of the fuel. As shown the hammer is in the form of a weighted body c^1 secured to a spring arm c^2 fixed to the receptacle *a* and adapted to be rocked by a cam finger *l* mounted on a rotary shaft *m*.

Within the conduit *e* there is a stirring apparatus consisting of a rotary shaft *n* and wings *g* carried thereby and adapted to be rotated within the passage in close proximity to the wall thereof. By the said stirring means the powdered fuel is whirled around and the heavier particles of the fuel which may drop to the bottom of the passage are raised by the wings *g* and returned into the blast of air, and, further, conglomerated powdered fuel is broken up. As shown the wings *g* and the fan *f* are mounted on a common shaft *n*, and the shaft *n* is connected with the shaft *m* by a belt gearing *o*. Both shafts are rotated from a motor *p* by a belt *q*.

The wings *g* are disposed angularly of the axis *n*, so that heavy particles of coal which do not float in the current of air are removed from the passage *e* either in the direction of the blast of air or in opposite direction for removal from said passage *e*. Such heavy particles are carried to the fireplace or to a disintegrator. One means of effecting a removal of the heavier particles consists of a trunk *r* connected to the passage *e* from which the heavy coal particles are removed by means of a screw conveyor *s*.

The present invention is distinguished from that disclosed by my co-pending application Serial No. 743,126 in that the claims herewith are confined to the means for producing a current of air through the conduit towards the furnace, stove or other burner exclusive of the means for vibrating the screen *b*, the latter means being made the subject-matter of the claims of the said co-pending application.

I claim:

1. An apparatus for supplying powdered fuel to a furnace, comprising a cylindrical horizontal conduit having its discharge end adapted to be connected with the furnace, means for supplying powdered fuel to said conduit throughout the length thereof and at a right-angle to the axis of said conduit, a rotary shaft extending through the conduit and having a fan mounted thereon for producing a current of air lengthwise of and through the conduit and at a right-angle to the axis of the conduit toward the furnace, and wings supported by said shaft at a distance therefrom and extending throughout the length of the conduit, the outer edges of said wings moving in proximity to the inner wall of said conduit and forming helices for mixing the air passing through the conduit parallel to the axis of the conduit with the powdered fuel supplied to said conduit in a

direction transversely of the air current, the wings raising into said current of air the particles of fuel from the lower portion of the conduit and at the same time moving the heavier particles of fuel in the direction of the air current toward the discharge end of the conduit.

2. A mixing apparatus for pulverized fuel burners, comprising a horizontal cylindrical mixing chamber, means for supplying powdered fuel to said chamber, means for producing a low pressure air blast longitudinally of said chamber, and revolving stirring mechanism in said chamber, said stirring mechanism comprising a plurality of helically arranged uninterrupted blades rotating on an axis concentric with said chamber and adapted to mix the powdered fuel in a state of fine distribution with the air blast and to hold same in a floating state throughout the length of said chamber, said blades also serving to remove from the mixing chamber the heavier particles of fuel not carried away by the low pressure air blast.

3. A mixing apparatus for pulverized fuel burners, comprising a cylindrical mixing chamber, means for supplying powdered fuel to said chamber, means for producing a low pressure air blast longitudinally of said chamber, and revolving stirring mechanism in said chamber, said stirring mechanism comprising a plurality of continuous blades rotating on an axis concentric with said chamber, said blades being arranged in non-parallel relation to said axis.

In testimony whereof I have hereunto set my hand.

EWALD HERMSDORF.