S. P. THOMSON.

PULVERIZED COAL FEEDER.

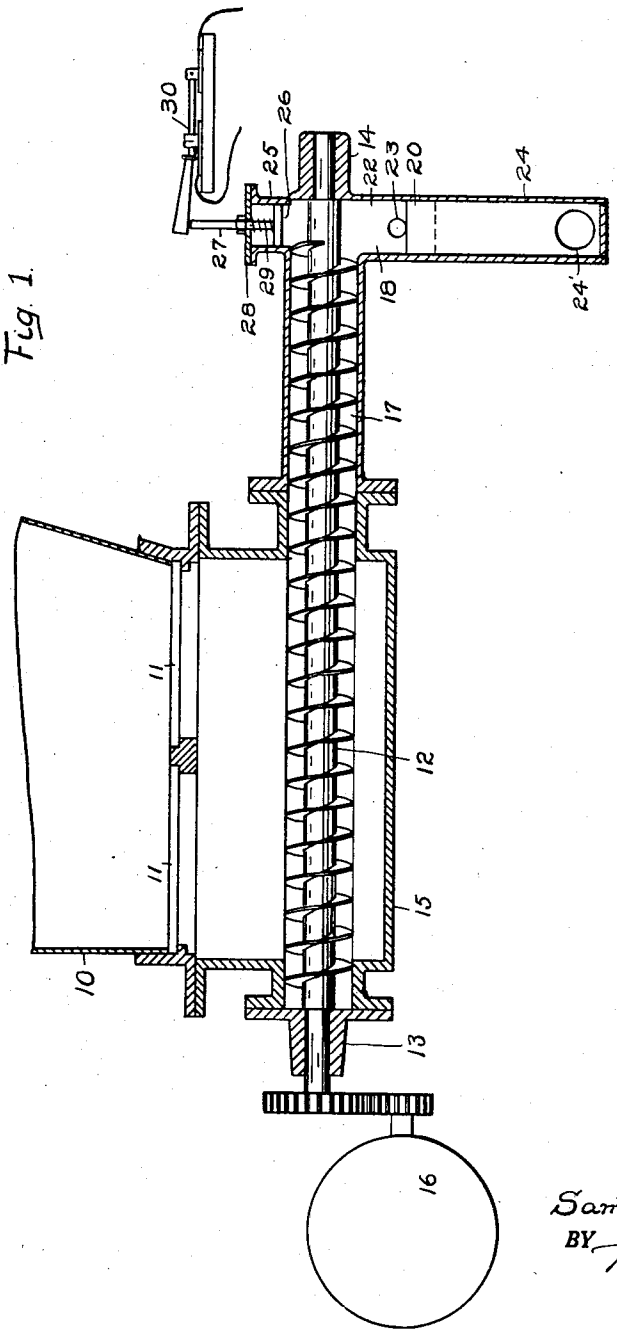
APPLICATION FILED JULY 19, 1917.

1,366,434.

Patented Jan. 25, 1921.

2 SHEETS—SHEET 1.

Fig. 1.



INVENTOR.

Samuel P. Thomson

BY Taylor & Hulse

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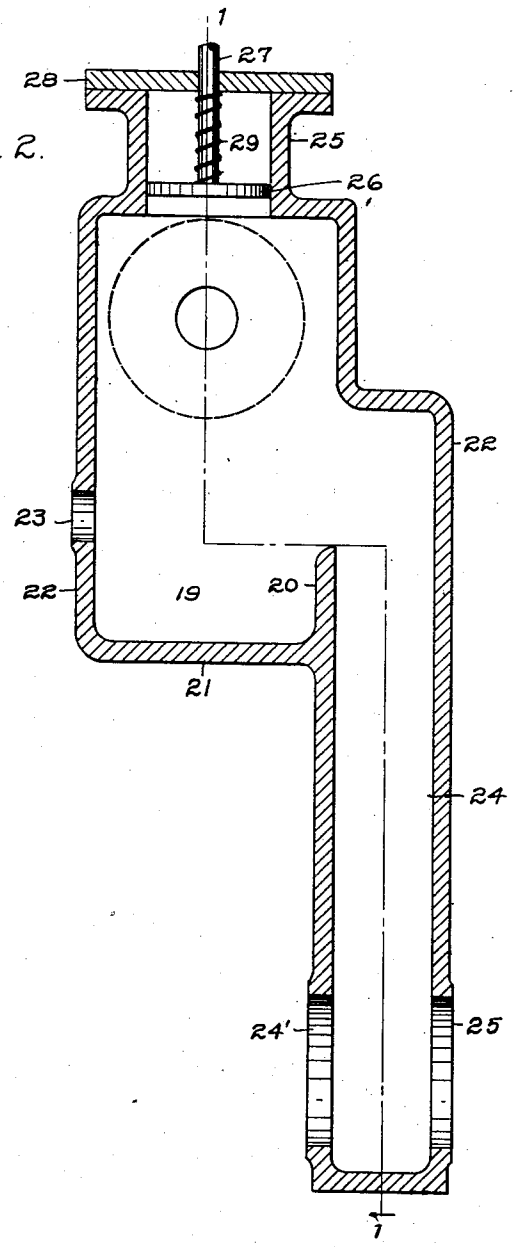
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2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

SAMUEL P. THOMSON, OF FORT WAYNE, INDIANA.

PULVERIZED-COAL FEEDER.

1,366,434. Specification of Letters Patent. Patented Jan. 25, 1921.

Application filed July 19, 1917. Serial No. 181,521.

To all whom it may concern:

Be it known that I, SAMUEL P. THOMSON, a citizen of the United States, residing at Fort Wayne, in the county of Allen and State of Indiana, have invented new and useful Improvements in Pulverized-Coal Feeders, of which the following is a specification.

The invention relates to devices for feeding pulverized coal into furnaces, boilers and the like, wherein the coal is mechanically conveyed from a storage receptacle or bin toward the furnace or boiler and blown into the latter by a blast of air. One of the disadvantages encountered in devices of this type is the frequent choking up of the conduit. The conveyer continues its operation, unless shut down, until the driving element can no longer drive it. The driving element is injured, especially if it is an electric motor, since if its armature cannot rotate it will break down at some point in its windings.

The object of the invention is to provide a feeding device with novel and simple means by which the disadvantage above set forth may be overcome and the driving device controlled in its operation. Another object is to provide means by which air in ample quantities is mixed with the coal before it passes in the fire box of the furnace or boiler.

In the drawings I have illustrated one manner in which the invention may be carried out in practice, in which drawings

Figure 1 is a longitudinal cross-section of the feeding device, the view of the air mixing chamber and power controlling device being taken on line 1—1 of Fig. 2.

Fig. 2 is a cross-section of the discharge conduit and power controlling device taken at right angles to the view in Fig. 1.

Referring to the drawings, 10 is the hopper for the coal, two slides 11 provided in the bottom being adapted by adjustment to control the flow of the coal from the hopper onto screw 12 which is revolubly mounted in bearings 13, 14 in frame or housing 15, motor 16 or other driving means being connected to the screw for rotating it at the proper speed. The screw rotates in conduit 17 and delivers the coal into chamber 18 of discharge conduit 24 where it falls into pocket 19 provided by partition 20 and by bottom 21 and side walls 22 of the chamber. The top edge of the partition is no higher than the bottom of aperture 23 in wall 22 through which the blast of air is admitted. The pocket fills up with the coal and the air blast sweeps across the top surface of the filled pocket taking with it some of that surface and the coal descending from the end of the screw conduit. The air, therefore, has an opportunity to thoroughly mix with the coal. The blast carries the mixture down through conduit 24 and through aperture 25 into the combustion chamber of the furnace or boiler (not shown).

Walls 22 of the conduit are extended above screw 12 and are contracted to provide a neck or cylinder 25 in which is suitably mounted for reciprocation a plunger 26, having its rod 27 projected through an aperture in cover plate 28 secured to the upper end of cylinder 25. Spring 29 tends to oppose the upward movement of the plunger. The outer end of plunger rod 27 is adapted to open a switch 30 of approved design which is in the electrical circuit of motor 16. The switch shown is merely illustrative.

In case the coal clogs in conduit 24 it will quickly accumulate in it and in its chamber 18 and eventually exert sufficient pressure on plunger 26 to overcome the tension on spring 29 and force the plunger upwardly to cause its rod to actuate switch 30 and break the motor circuit. The motor, therefore, stops and no harm is done to it. The clogged mass is removed through opening 24′ which, in practice, is closed by a suitable door or plate.

In metal furnace practice where powdered coal is the fuel used the clogging of the feeding apparatus is of very frequent occurrence and unless an attendant is constantly alert the power producing device will be damaged within a very short time after the clogging of the feeder begins. By my invention the power is automatically shut down by the clogged material itself and no harm is done to the power plant, thereby producing a large saving in time and money for the operator.

What I claim is:

1. In a pulverized coal feeder, the combination of a substantially vertical conduit having a discharge opening at its lower end, a normally lowered member mounted in the upper end of said conduit for vertical movement, a horizontal tubular conduit having one end communicating with the vertical

conduit adjacent its upper end, a conveyer in said horizontal conduit to feed pulverized fuel into said vertical conduit, means to actuate the conveyer, and means to control the operation of the conveyer actuating means operatively associated with said normally lowered member whereby the latter is engaged and moved upwardly by excess fuel accumulated in the vertical conduit to operate the controlling means for rendering the conveyer actuating means inoperative.

2. In a pulverized coal feeder, the combination of a substantially vertical conduit having a discharge opening at its lower end, a normally lowered plunger reciprocably mounted in the upper end of said conduit, a horizontal tubular conduit having one end communicating with the vertical conduit adjacent its upper end and below said plunger, a conveyer in said horizontal conduit to feed pulverized fuel into said vertical conduit, means to actuate the conveyer, and means to control the operation of the conveyer actuating means operatively associated with the plunger whereby the latter is engaged and moved upwardly by excess fuel accumulated in said vertical conduit to operate the controlling means for rendering the conveyer actuating means inoperative.

In witness whereof I hereunto subscribe my name this 13th day of July, 1917.

SAMUEL P. THOMSON.