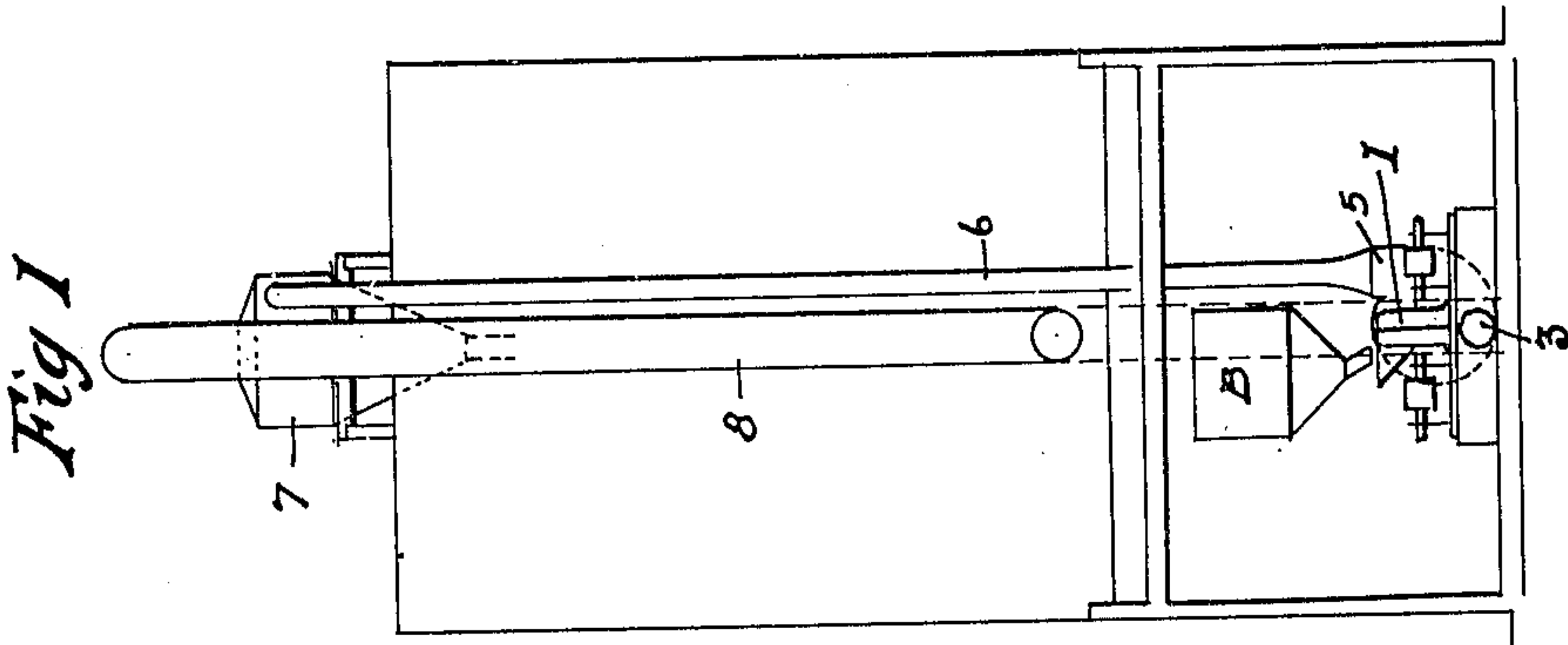
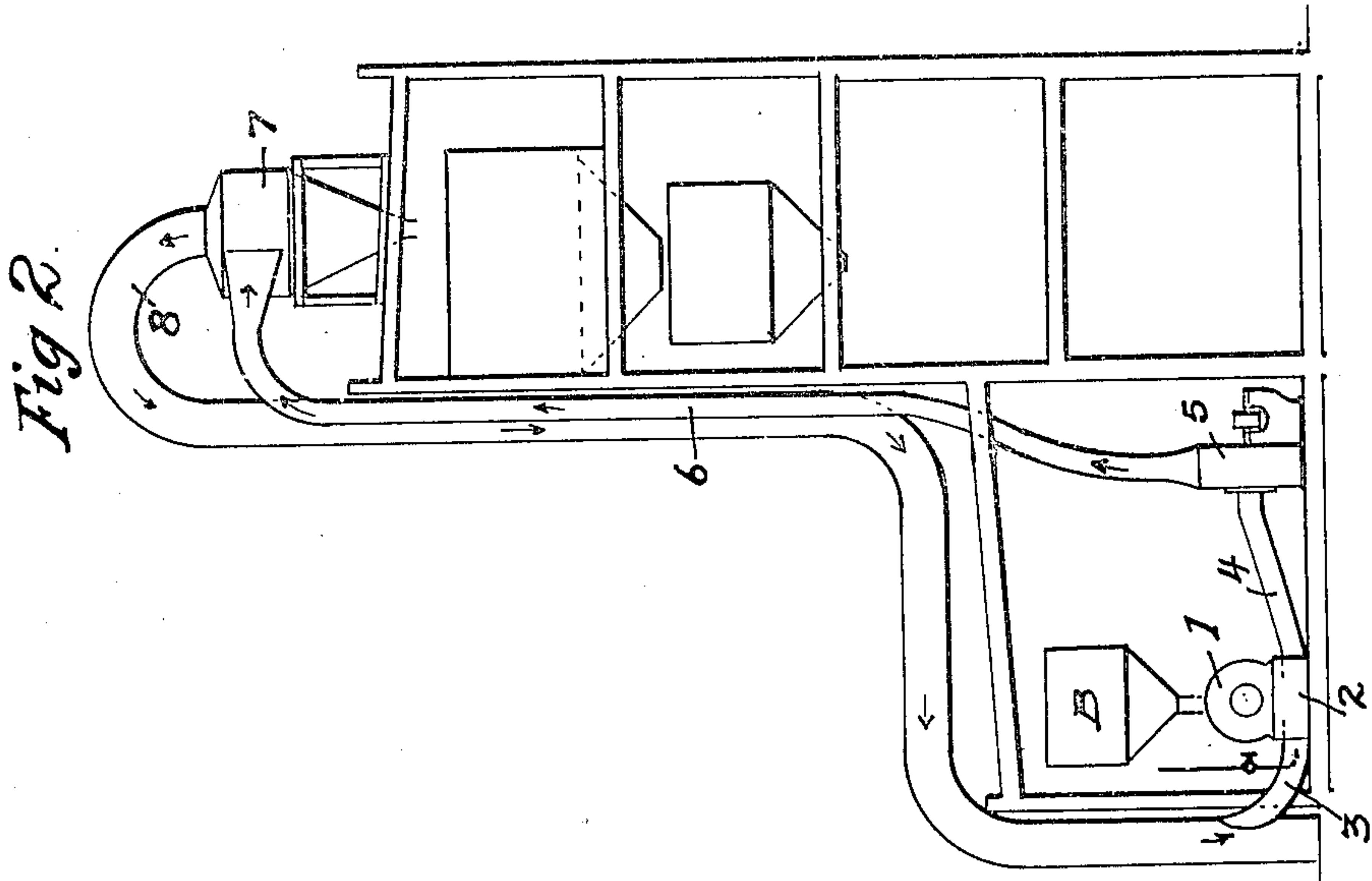


No. 869,622.

PATENTED OCT. 29, 1907.

G. E. CHAMBERLAIN.  
APPARATUS FOR MILLING GRAIN.  
APPLICATION FILED MAY 19, 1905.



WITNESSES:

*Wm. F. Reimer.*  
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INVENTOR :

*George E. Chamberlain,*

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ATTORNEYS.

# UNITED STATES PATENT OFFICE.

GEORGE E. CHAMBERLAIN, OF ST. LOUIS, MISSOURI.

## APPARATUS FOR MILLING GRAIN.

No. 869,622.

Specification of Letters Patent.

Patented Oct. 29, 1907.

Application filed May 19, 1905. Serial No. 261,161.

*To all whom it may concern:*

Be it known that I, GEORGE E. CHAMBERLAIN, a citizen of the United States, and a resident of the city of St. Louis and State of Missouri, have invented a new and useful Apparatus for Milling Grain, of which the following is a specification.

Vertical-disk attrition mills A are in common use for grinding grain. In practice, the grain is fed between two metallic disks 1 that are rotating very rapidly in opposite directions, and the ground grain is delivered below the disks. In the practical operation of grinding grain there is a large number of sparks on the delivery side of the mill and the grain is frequently set afire thereby.

The principal object of my invention is to minimize the danger of fire arising in this manner.

In the handling of the ground grain, there is danger of loss of a portion of the proteids, which constitute the most important portions thereof; and it is one of the objects of my invention to minimize this loss. The grain is also liable to lose moisture, and it is one of the objects of my invention to provide means for preventing such loss or restoring lost moisture to the grain.

In the accompanying drawing which forms part of this specification and wherein like symbols refer to like parts wherever they occur, Figure 1 is an end elevation and Fig. 2 is a side elevation of a plant embodying apparatus for the practice of my process.

The mill is a vertical-disk mill preferably of the type commonly known as Foss mill. In this mill, metallic attrition disks 1 are mounted opposite each other on horizontal shafts arranged to rotate in opposite directions at high speed. Above the mill is a hopper arranged to deliver grain between the disks. The disks are inclosed in a casing which has an extension or enlargement 2 below the disks. This enlargement of the casing has a flue 3 opening into it on one side and on the opposite side of the enlargement is another flue 4 which constitutes the inlet or suction pipe of a fan blower 5. The outlet side of said fan-blower communicates with a flue 6 which extends upwardly and opens tangentially into the cylindrical chamber of the cyclone dust collector. The outlet flue 8 of this cyclone dust collector extends upwardly from the axis of the cylindrical chamber and the grain or separator outlet is arranged at the bottom of the chamber, in accordance with the usual practice.

The outlet flue of the cyclone dust collector preferably extends back to and communicates with the inlet flue 3 of the mill casing. The advantage of this arrangement is that the fine particles of proteids which escape into the outlet flue from the cyclone dust collector are returned thereto. However, the air inlet flue 3 may be open at its end in which case it should

extend through the wall of the building so as to avoid the creation of too strong drafts inside thereof. The air inlet flue is not indispensable, as an opening in the mill casing itself is sufficient; but it is advantageous to have a separate air inlet pipe.

In order to moisten the grain, a sprayer or steam jet 9 is provided. Preferably this steam jet opens into the air inlet pipe close to the mill casing; but obviously, it may open into the casing itself or into the outlet flue.

The blower has been described as located in the outlet pipe leading from the mill casing. One of the most important advantages of this location is that it tends to produce a suction or draft downwardly through the mill and thereby aid materially in the feeding of the grain. The amount of draft through the mill in such case may be regulated by a damper or door covering an opening provided for the purpose in the mill casing near the feed opening. The draft through the mill may also be varied by varying the size of the opening of the inlet pipe.

In the practice of my invention, the grain is fed into the attrition mill and delivered therefrom into the lower extension or enlargement of the mill casing. Through this lower enlargement or extension of the casing, the fan blower is causing a rapid current of air which carries the particles of grain upwardly to the cyclone dust collector which separates and collects the grain. In this operation the air assists materially in feeding the grain to the mill and in delivering the ground particles therefrom; and actual experience has demonstrated that there is practically no danger of fire occurring in the practice of the process.

What I claim as my invention and desire to secure by Letters Patent is:

1. Apparatus for milling grain consisting of a vertical-disk attrition mill, a casing therefor, a dust collector, a blower, a flue connecting said blower and collector and means for injecting moisture into said flue at a point close to said mill, said flue communicating with said casing on opposite sides thereof and directly below the attrition mill whereby the danger of fire is minimized.

2. Apparatus for milling grain consisting of an inclosed vertical-disk attrition mill, a cyclone dust collector, an air blower, and an endless flue passing directly below said mill and arranged to receive the grain directly therefrom and having the blower and the dust collector in its circuit, the mill being on the suction side and the dust collector on the delivery side of said blower, and means for injecting moisture into the flue on the suction side of the mill.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses, this 13th day of May, 1905, at St. Louis, Mo.

GEORGE E. CHAMBERLAIN.

Witnesses:

FRED F. REISNER,  
J. B. MEGOWN.