

D. BONNELL.

Grain Drier.

No. 82,589.

Patented Sept. 29, 1868.

Fig: 2.

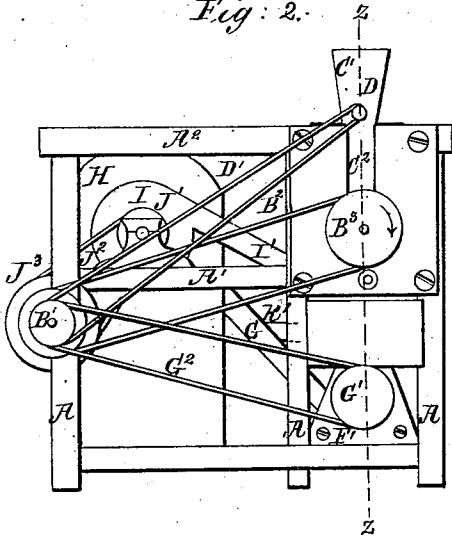


Fig: 4

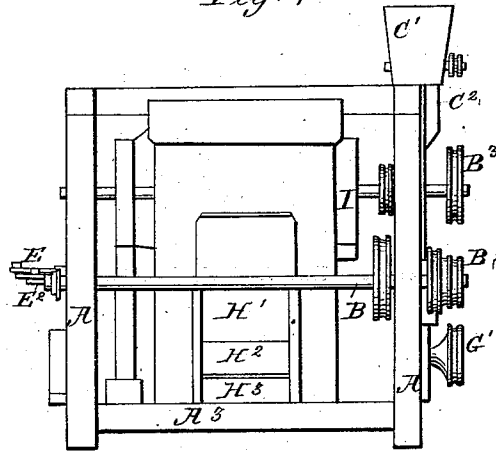


Fig: 1.

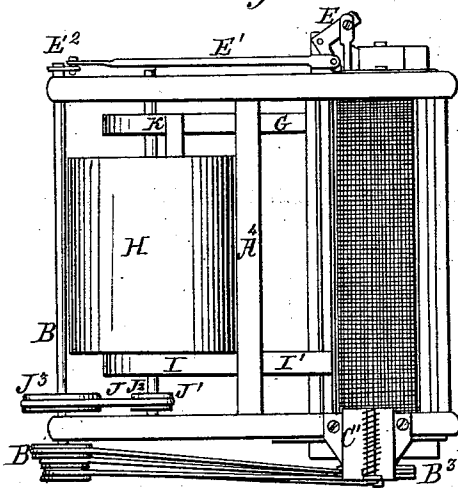


Fig: 3.

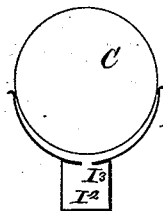
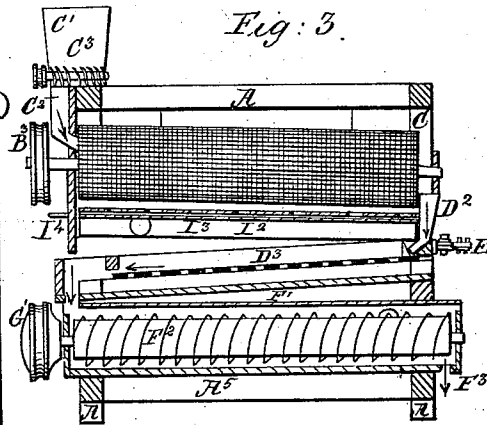


Fig: 5.

Witnesses.
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Inventor.
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By his Atty J. Dennis Jr

United States Patent Office.

DAVID BONNELL, OF OSWEGO, NEW YORK.

Letters Patent No. 82,589, dated September 29, 1868.

IMPROVEMENT IN GRAIN-DRIERS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, DAVID BONNELL, of the city and county of Oswego, State of New York, have invented certain new and useful Improvements in Machines for Drying and Cooling Grain, &c.; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention or improvements without further invention or experiment.

The nature of my invention and improvements consists in the peculiar construction and arrangement of devices for drying grain, described in the following specification, and represented in the drawings.

In the accompanying drawings—

Figure 1 is a plan or top view.

Figure 2, one end, showing the belts which operate the several parts of the machine.

Figure 3 is a section on the line *z z* of fig. 2.

Figure 4 is the rear side.

Figure 5 is a cross-section of the drying-cylinder, with air-box that supplies heated air to the cylinder.

In these drawings, *A A* are the six posts of the frame, connected by the end girders *A¹ A¹*, top rails *A² A²*, and by the side bars *A³ A³*, top bar *A⁴*, and bottom bar *A⁵*, which are all firmly fastened together, making a strong frame.

The shaft *B* is arranged to turn in proper boxes fastened to the posts *A*, and may be provided with a gear, or fast and loose pulleys, for a belt to turn it from some moving-power.

The pulley *B¹*, on the shaft *B*, has several grooves in it, from one of which the band *B²* turns the pulley *B³* on the drying-cylinder shaft, which turns in boxes fastened to the frame.

The drying-cylinder *C* is a skeleton-frame, covered with woven wire or perforated sheet metal, open at each end for the grain to enter and pass through. This cylinder should be provided with floats on the inside, arranged spirally or otherwise, so as to lift or carry up the grain as the cylinder is turned, and let it fall or slide off of the float, and, at the same time, leave a vacant space under or behind the float, into which the hot air can pass with very little resistance, and mix with the grain as it falls from the float, and dry it very fast. This construction and arrangement allow the hot air to enter the cylinder with but slight resistance from the grain inside, which is a very great advantage.

To supply the grain to the cylinder *C*, I fasten the hopper *C¹* to the top of the frame, with a spout, *C²*, to lead the grain into the cylinder. And, to graduate the supply of grain, I put a spiral conveyer, *C³*, in the bottom of the hopper, with a pulley, *D*, and band, *D¹*, to turn the conveyer, and bring the grain to the spout.

The cylinder *C* is inclined, so that the grain which enters the upper end shall descend and pass out at the lower end into the spout *D²*, which conducts it on to the inclined screen *D³*, which is agitated by the bell-crank *E*, worked by the rod *E¹* from the crank *E²* on the shaft *B*. The screen *D³* is open at the top, and works in the box *F*, into which a blast of cold air is driven, which passes up through the perforated sheet-metal or wire screen amongst the grain, to cool it, and carry off some of the moisture, should any remain in the grain with the caloric, as it is a well-known law of nature, that if the temperature of a body containing moisture is lowered, a portion of the moisture goes off with the caloric. The motion of the screen *D³* shakes the grain off at the lower end into the conveyer-trough *F¹*, where the conveyer *F²* conveys it to the opposite end of the machine, and it passes out through the opening *F³*. While passing through the conveyer-trough *F¹*, it is subjected to a blast of cold air from the pipe *G*. The conveyer-shaft has the pulley *G¹* on it, for the band *G²*, from the pulley *B¹*, to turn the conveyer.

To supply hot air to the cylinder *C*, I make a furnace, *H*, with door, *H¹*, grate, *H²*, and ash-pit, *H³*, with a proper chimney or flue, to convey away the smoke, with an opening in the rear to admit cold air, which passes up in the furnace, and is heated and drawn into the fan *I* on the side of the furnace, and forced by the fan through the pipe *I¹* into the box *I²*, right under the cylinder *C*, which box has long openings through the top, through which the hot air passes into the cylinder *C*, which openings may be opened and closed by the slide *I³*,

worked by the stem I⁴. The top of the box J² is curved, and turned up each side of the cylinder as high as the centre of the cylinder C, to compel the hot air to pass into the cylinder C amongst the grain.

The shaft J of the fan I turns in boxes on the girders, and is provided with a pulley, J¹, with a band, J², to the pulley J³ on the shaft B.

I make a second fan, K, on the shaft J, to blow cold air through the pipe G to the conveyer F², and through the branch-pipe K¹, under the screen D³, to cool the grain as it passes over the screen in the process of drying. After the anthracite coal on the furnace-grate gets to burning clearly, the chimney which conveyed away the smoke may be closed, and the gases escaping from the fire drawn into the fan and blown into the grain.

I claim—

1. The drying-cylinder C, supplied with heated air, in combination with the cooling-screen D³, supplied with cold air, substantially as described, for the purposes set forth.

2. And, in combination with the drying-cylinder C and cooling-screen D³, the conveyer, supplied with cold air, as described, for the purposes set forth.

3. And, in combination with the drying-cylinder, cooling-screen, and conveyer, arranged as shown and described, the furnace and fans for supplying hot and cold air, substantially as described, for the purposes set forth.

DAVID BONNELL.

Witnesses:

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GEO. W. BURT.