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PATENTED DEC. 17, 1907.

W. GRAY.
CUT-OFF AND BLAST REGULATOR FOR GRAIN, ORE, AND MINERAL
SEPARATORS.

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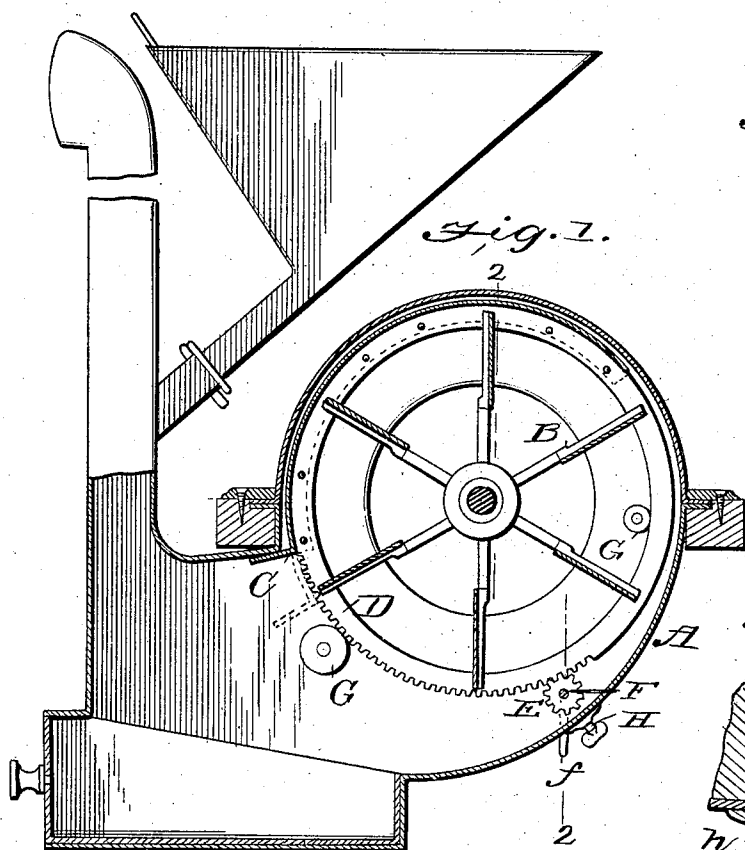


Fig. 3.

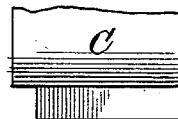


Fig. 4.

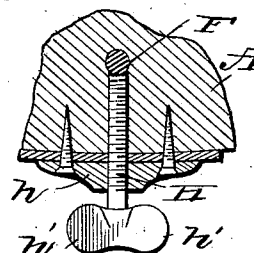
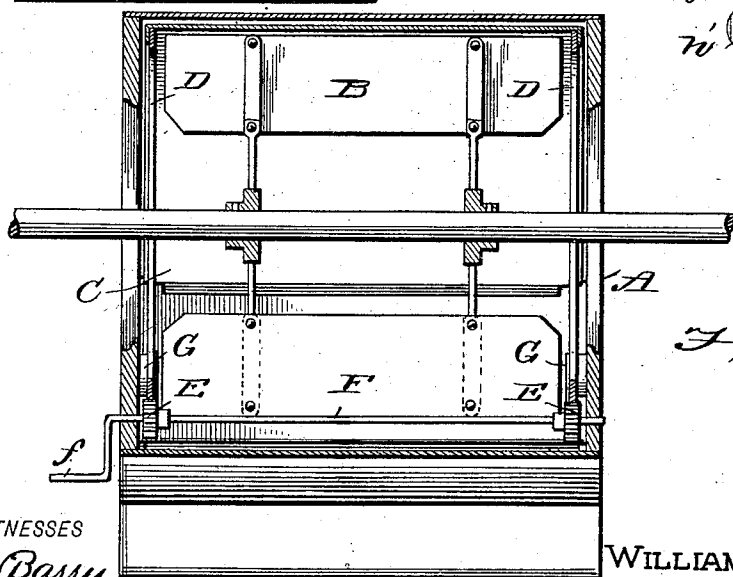


Fig. 2.

WITNESSES

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WILLIAM GRAY, OF LINCOLN, NEBRASKA.

CUT-OFF AND BLAST-REGULATOR FOR GRAIN, ORE, AND MINERAL SEPARATORS.

No. 874,329.

Specification of Letters Patent.

Patented Dec. 17, 1907.

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To all whom it may concern:

Be it known that I, WILLIAM GRAY, a citizen of the United States, and resident of Lincoln, in the county of Lancaster and State of Nebraska, have invented a new Cut-Off and Blast-Regulator for Grain, Ore, and Mineral Separators, of which the following is a specification.

Heretofore the air blast of such fans has been usually controlled by partially closing the openings in the ends of the fan casing with slide board or dampers. In such use the entire force of the fan is drawing all the air received through two small openings, one at each end of the fan, thus producing a partial vacuum in the fan so that very strong currents of air enter the fan casing and encounter and resist each other at the center of the fan. Consequently the air blast is delivered with more force from the center of the fan casing and spout than at the sides of the same, and thereby effects very imperfect separation. It has been sought to avoid this defective operation and result by employing a curved segmental slide for regulating the size of the opening in the fan casing through which the air blast is delivered to the spout, but the means for adjusting and guiding the slide have been defective and unsatisfactory for several reasons. I have devised a blast regulator which possesses all the advantages without the defects and objections of the inventions before referred to.

The details of construction, arrangement, and operation are as hereinafter described and illustrated in the accompanying drawing, in which

Figure 1 is a sectional elevation of a fan with my improved blast regulator. Fig. 2 is a vertical cross section on line 2—2 of Fig. 1. Figs. 3 and 4 are views showing details hereinafter described.

The fan box or casing A and fan B have no peculiarity of construction and arrangement.

C indicates the cut-off and blast regulator proper, D, D, the circular frame and rack bars to which it is attached, and E, E, pinions meshing with the racks, and F a shaft upon which the pinions are keyed.

The cut-off or blast regulator proper C, is formed of sheet metal, preferably of galvanized iron, and the same is curved concentrically with the axis of the fan B. Its side edges are bent inward as indicated in Fig. 2, and overlap the outer sides of the circular

rack bars D, to which such flanges are permanently secured, preferably by soldering. The plate C extends nearly half way round the circumference of the bars D. The under portions of the latter are provided with teeth constituting the racks proper with which pinions E mesh as shown. The said pinions are secured upon a transverse shaft F which is journaled in the fan box or casing A and provided at one end with a crank *f*. The circular rack bars D and the plate C attached thereto are supported upon the said pinions and also by idler rollers G which are mounted on journals fixed in the sides of the casing A. These supports E, G, are so arranged that the plate C is always held in a position concentric with the axis of the fan. The pinions thus perform a double function, namely, supporting the blast regulator at one point and also serving as means, when the crank shaft F is rotated, for shifting the cut-off proper C circularly around the fan so as to cut off the air or blast delivered from the fan. In other words by adjustment of the plate C, the mouth of the spout into which the air from the fan discharges may be contracted more or less and yet the blast will remain perfectly even across the entire width of the mouth or opening so that the separation of the grain or other material operated upon is correspondingly even or uniform.

As indicated in Fig. 3, the lower corners of the plate or blast regulator proper C, are notched or cut away to allow space for the idlers G in case the plate should be adjusted downward as far as said idlers.

In order to prevent accidental movement of the blast regulator, after having been adjusted to any required position, a friction brake may be applied to the pinion shaft E, the same consisting, as shown in Figs. 1 and 4, of a screw threaded bolt H having a threaded portion working in a nut *h* attached to the outer side of the casing A and provided with wings *h'* whereby it may be rotated. The inner end of the bolt H is arranged contiguous to the shaft F, and may be screwed into contact with it, as will be readily understood.

It will be seen that by use of the racks and pinions, the cut-off C may be adjusted to a small fraction of an inch, so as to regulate the air blast to a nicety; also, that by supporting the cut-off by the means shown, there is no perceptible friction, nor any danger of

binding by friction as would be the case if the plate C was held slidably in grooved side guides.

My invention is applicable for separators 5 for grain, ore, minerals, seeds and cereals, and in brief for a great variety of granular or pulverulent material.

I claim:

1. The combination with the fan, the fan 10 casing and spout attached thereto, of the cut-off and blast regulator comprising the curved plate, circular parallel rack bars to which said plate is attached, a rotary shaft and pinions thereon meshing with the rack bars, 15 and idler rollers which together with the pinions furnish supports for the cut-off and regulator, substantially as described.

2. The combination with the fan, the fan 20 casing and spout attached thereto, of a cut-off and blast regulator, comprising a plate curved concentrically with the axis of the

fan, parallel circular bars spaced apart and attached to the ends of the said plates and provided on their lower side with teeth whereby they constitute racks, pinions mesh- 25 ing with the racks and means for rotating the pinions whereby the cut-off may be adjusted as required, substantially as described.

3. The combination with the spout, fan, fan casing and the rotary cut-off arranged in 30 the casing, and including circular rack bars, of pinions meshing with the racks, a rotary shaft on which the pinions are mounted, and a friction brake, the same consisting of a rotary threaded bolt, and a nut secured to the 35 casing, the inner end of the bolt being arranged for contact with the shafts, substantially as described.

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Witnesses:

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