

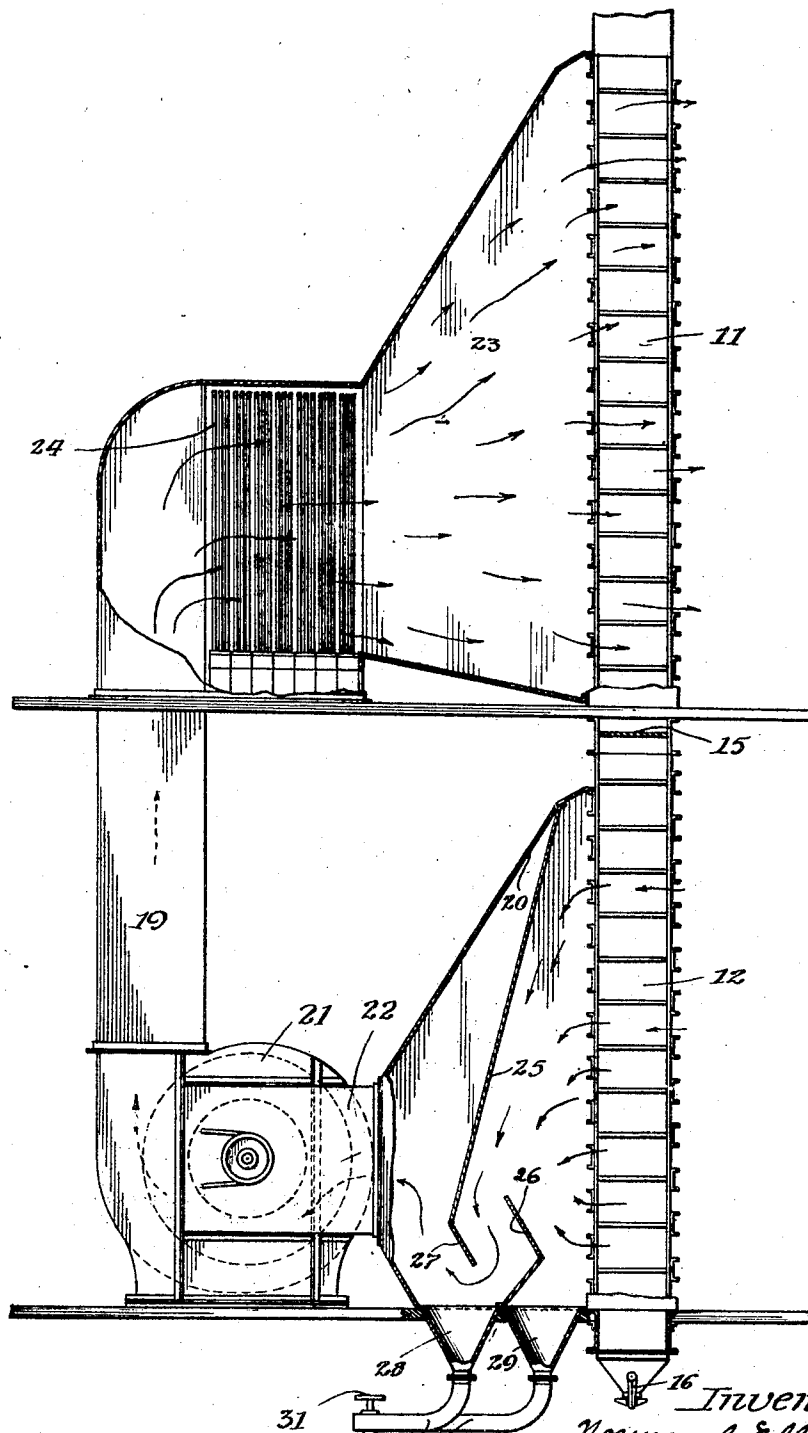
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GRAIN DRIER

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UNITED STATES PATENT OFFICE.

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GRAIN DRIER.

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The invention relates to grain driers and more particularly to that type in which the air is first drawn through the apparatus, then heated and forced through the apparatus again to complete the drying.

In the operation of grain driers, exemplified in Letters Patent No. 1,127,794, dated February 9, 1915, it has been found that considerable dust is carried from the cooler by the air and this dust passes into and through the blower and is arrested by the heater before it passes into the drying section of the drier. The accumulation of the dust around the drier is objectionable because, in instances where the dust has an oily constituent, it is combustible and liable to cause an explosion when ignited by spontaneous combustion and, furthermore, the efficiency of the heater is decreased by this accumulation of dust. The primary object of the invention is to provide improved grain-drying apparatus, in which provision is made for preventing the accumulation of dust at the heater and thus to prevent the possibility of explosion and the lessening of the efficiency of the heater.

The invention consists in the several novel features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

The figure is a vertical section of apparatus embodying the invention, parts being shown in elevation.

The invention is exemplified in a structure comprising a grain drier 11, in which the grain is subjected to a blast of hot air, and a cooler 12 into which the grain passes from the drier and in which the grain is subjected to a blast of cold air or unheated air. The drier and cooler may be of any suitable construction, such, for example, as that set forth in the aforesaid Letters Patent No. 1,127,794, so that a detail illustration and description thereof are not deemed necessary. The drier illustrated in said patent embodies a series of grain shafts in the drier through which the grain descends in settling columns and is discharged under control of suitable valve mechanism 15 into similar grain shafts of the cooler 12, through which the grain also passes in settling columns and from the lower end of which it is discharged under control of a valve 16.

The apparatus comprises a blower 21, an inlet 22, for the blower which is connected

to the exhaust ducts of the cooler by a trunk 20, so that air will be drawn into the intake ducts of the cooler through the grain in the shafts, through the exhaust ducts and said trunk to the intake eye of the blower. A discharge trunk 19 is connected to the outlet of the blower 21 which is connected to the air-supply trunk 23 for the drier 11. Heater pipes 24 are disposed in the trunk 23 so that the air from the blower will be heated before it passes into the drier 11. The hot air from the trunk 23 will be forced through the grain columns and exhaust ducts in the drier 11 and then discharged.

In the operation of these driers, in which the air is successively passed through the cooler and drier and heated after it has passed through the cooler, it has been found that the air carries off considerable dust, even though the flue structure embodied in the cooler is made as efficient as possible, and this dust is usually arrested by the heater, around which the blast is forced in transit to the drier section, which results in an accumulation of such dust in the lower portion of the heater. To prevent this accumulation, baffles 25, 26 and 27 are provided in the trunk 20 to cause air to travel in a tortuous path in transit from the cooler 12 to the blower 21 and so that the velocity of the dust will be decreased to cause it to drop into the collecting chambers 28 and 29 which are connected to, and in communication with, the lower end of the trunk 20. Hopper 29 is disposed under the baffle 26 and is in communication with the lower end of the space between the cooler 12 and said baffle, so that dust arrested by the baffles will be directed into said hopper. The hopper 28 is connected to the space below the passage between baffles 26 and 27 and the outer wall of the trunk 20, so that the dust, which is arrested in said passages, will fall into and be collected in the hopper 28. Hoppers 28 and 29 are connected to a passage pipe 30 which is normally closed by a valve 31.

In operation, the exhaust from the cooler 12, produced by a section of the blower 21, will cause the dust laden air to be projected against the baffles. As the dust strikes the baffles, its velocity will be retarded so that it will gravitate into the collectors 28 and 29. Whenever desired, the dust may be

discharged from these collectors through valve 31.

The invention exemplifies grain drying apparatus in which the air is successively passed through a plurality of units, such as a cooler and a drier, and in which provision is made for eliminating the dust from one unit before it is heated and passed to the other unit or between the cooler and the heater in the duct leading to the drier, so that the dust will not be carried to, and accumulate at, the heater used to raise the temperature of the air in transit to the drier or be forced into the drier; also, an apparatus of this type, in which accumulation of combustible dust at the heater is effectively prevented, so that dust explosions are avoided and the efficiency of the heater is not decreased by an accumulation of dust around it.

The invention is not to be understood as restricted to the details set forth, since these may be modified within the scope of the appended claims, without departing from the spirit and scope of the invention.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a grain drier, the combination of a drier-unit, a cooler-unit, a blower, a conduit between the cooler-unit and the intake

side of the blower, a conduit between the exhaust side of the blower and the drier-unit, said blower being adapted to draw air through the cooler-unit and force it through the drier-unit, a pair of substantially imperforate baffles secured in said first mentioned conduit and extending thereacross, said baffles being spaced apart and extended to lap each other to cause the air to travel in a tortuous path and the dust carried thereby to be arrested, and a collector for the dust.

2. In a grain drier, the combination of a drier-unit, a cooler-unit, a blower, a conduit between the cooler-unit and the intake side of the blower, a conduit between the exhaust side of the blower and the drier-unit, said blower being adapted to draw air through the cooler-unit and force it through the drier-unit, a pair of substantially imperforate baffles rigidly secured to the top and bottom of the first mentioned conduit respectively and extending transversely across the latter, said baffles being spaced apart and extended to lap each other to cause the air to travel in a tortuous path and the dust carried thereby to be arrested, and a collector for the dust secured to the bottom of the said first mentioned conduit.

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