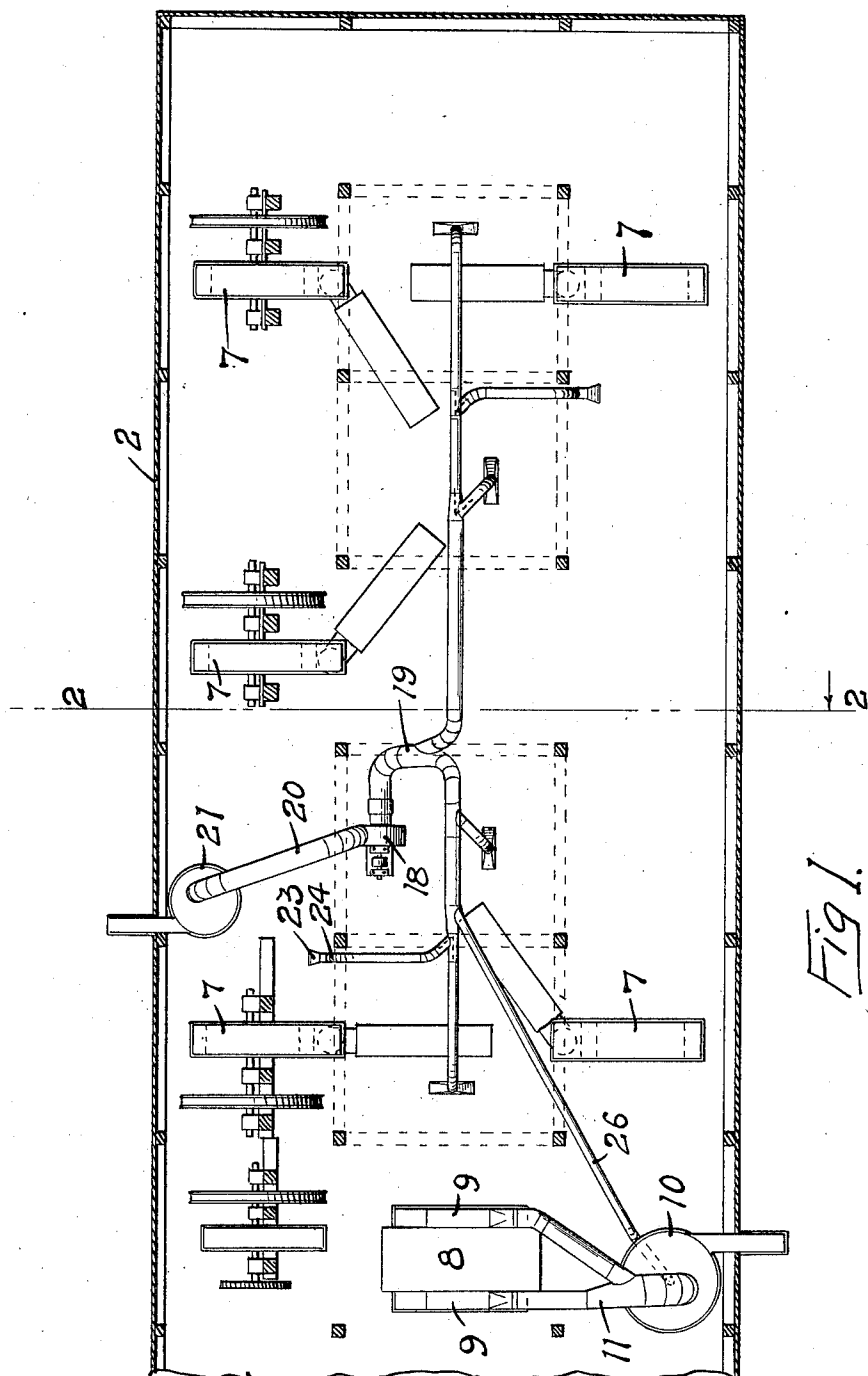


1,029,531.

H. L. DAY.
DUST COLLECTING SYSTEM.
APPLICATION FILED DEC. 7, 1908.

Patented June 11, 1912.

4 SHEETS—SHEET 1.



WITNESSES
M. Walstrom
J. A. Binghamton

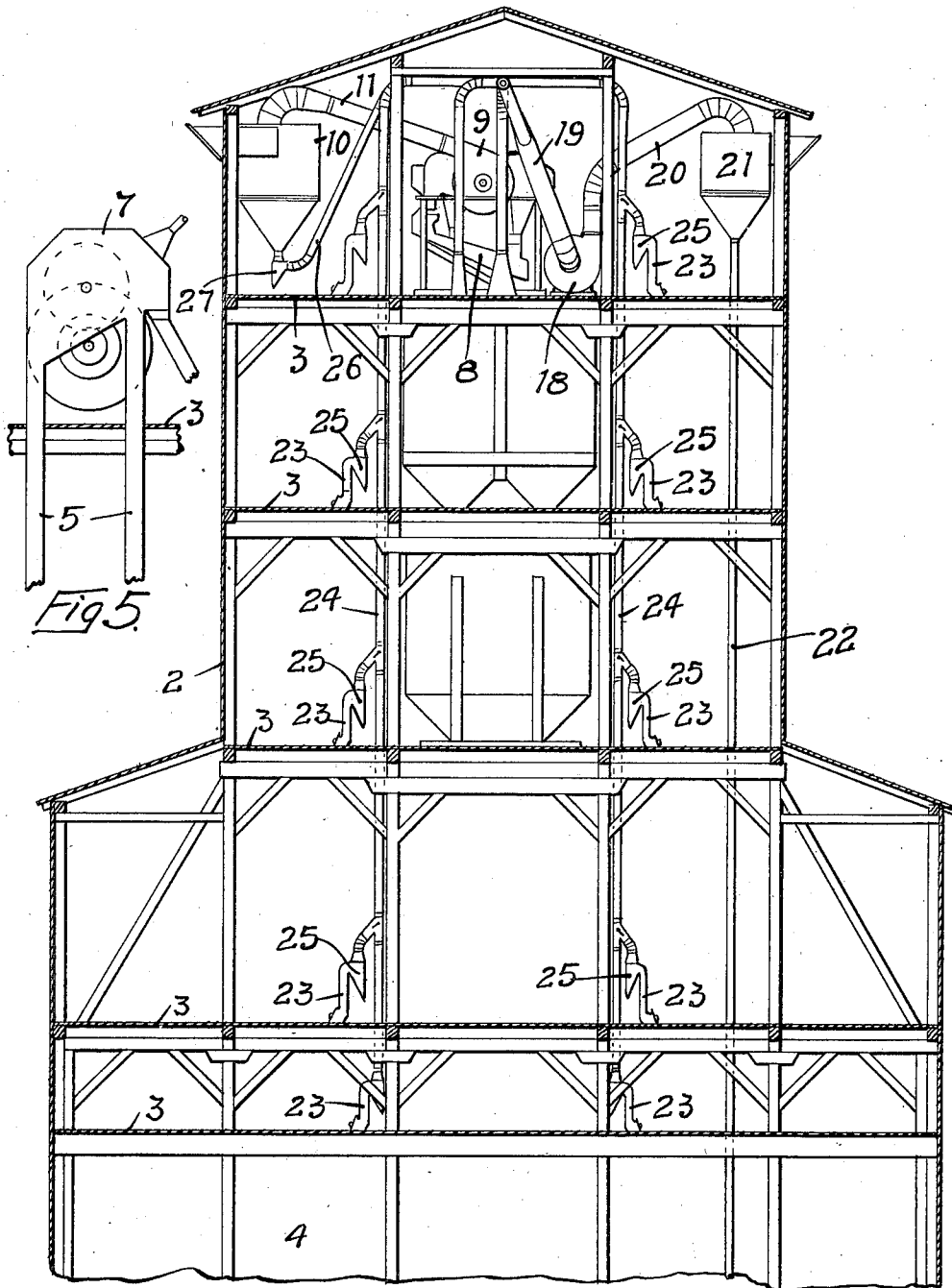
INVENTOR
HENRY L. DAY
BY *Paul & Paul*
HIS ATTORNEYS

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4 SHEETS—SHEET 2.



WITNESSES
M. Wakelin
J. B. Byington

Fig 2. x-x

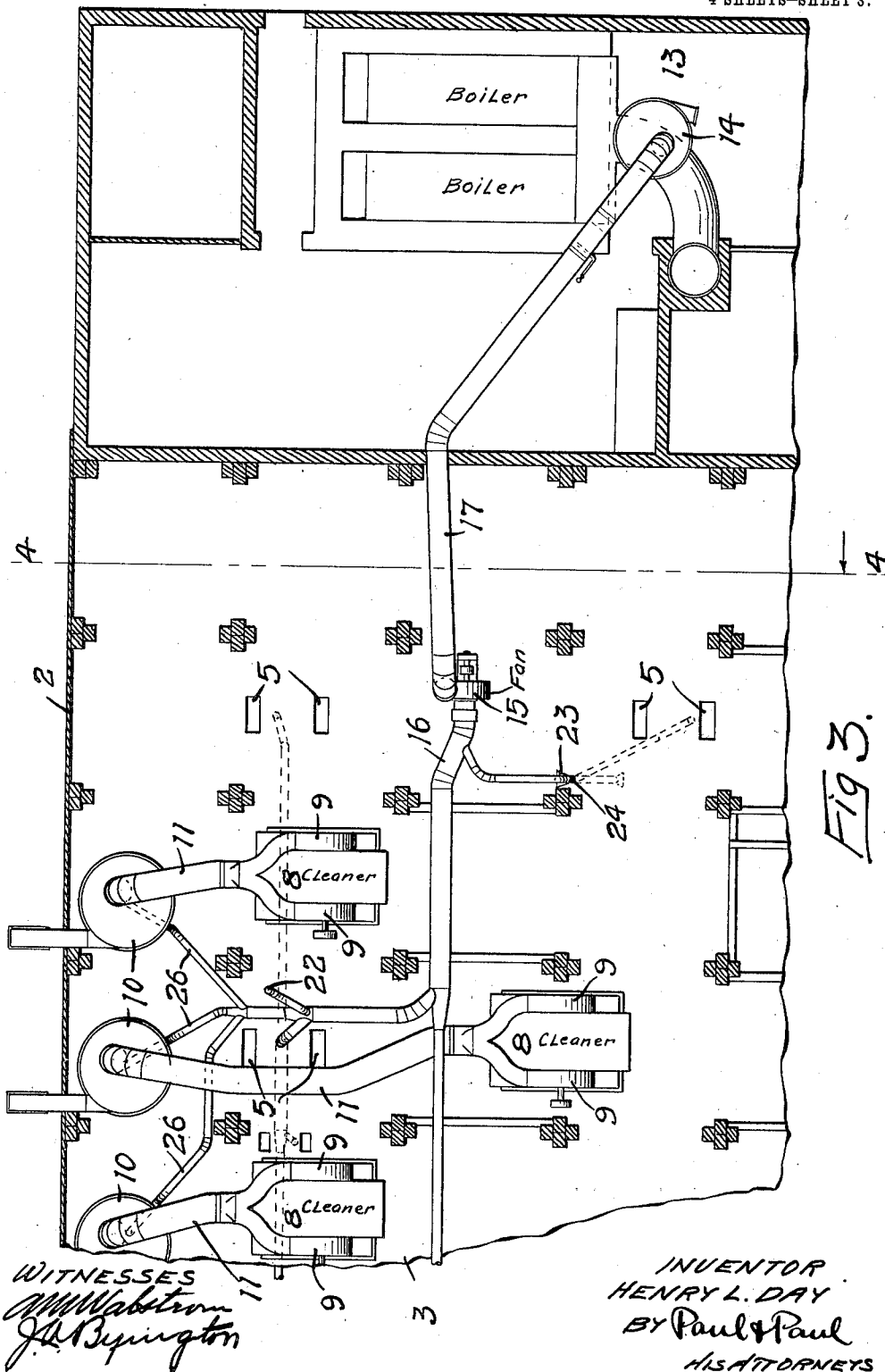
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4 SHEETS—SHEET 3.



WITNESSES
W. Watson
J. A. Byington

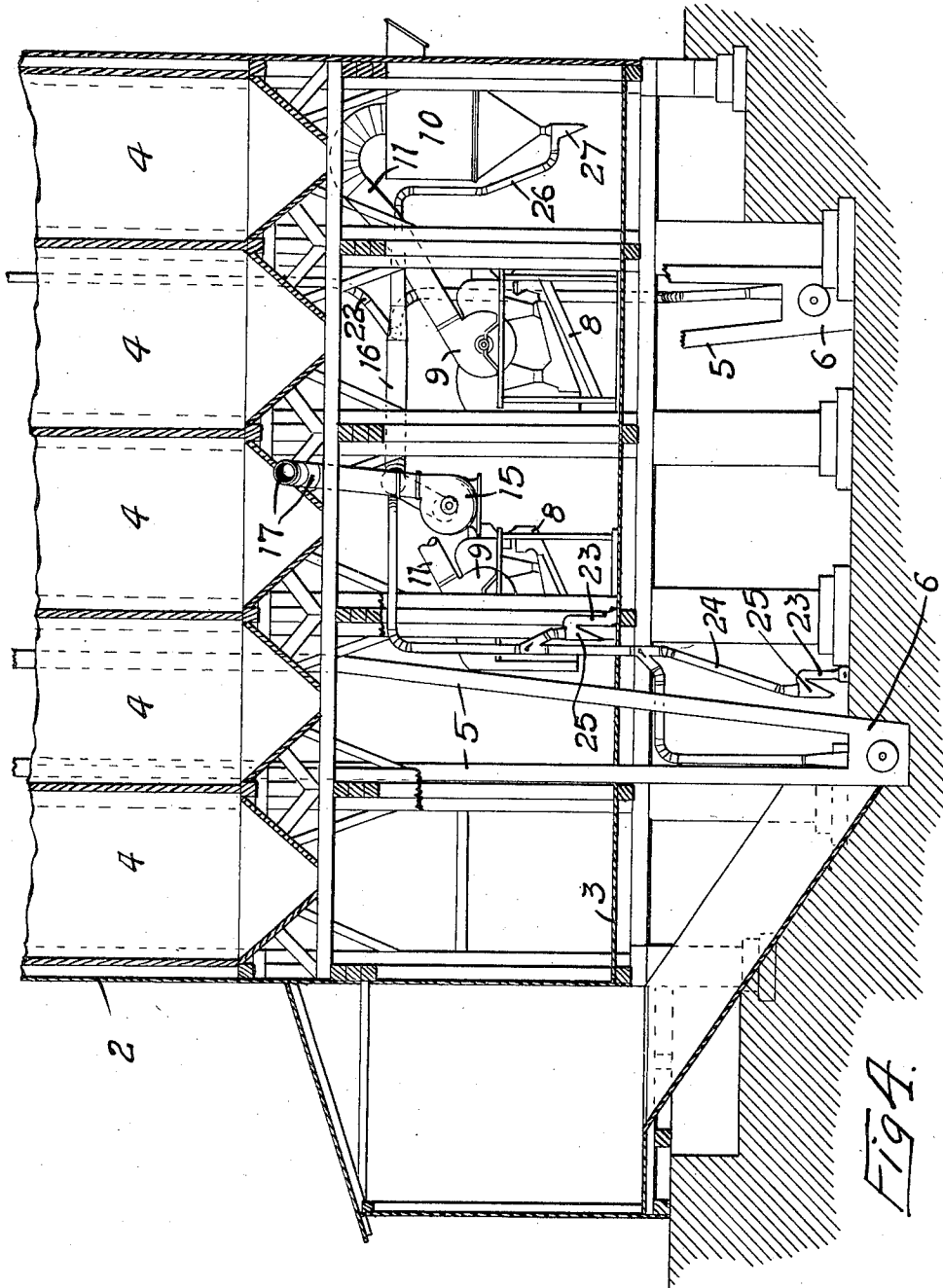
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4 SHEETS-SHEET 4.



WITNESSES
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UNITED STATES PATENT OFFICE.

HENRY L. DAY, OF MINNEAPOLIS, MINNESOTA.

DUST-COLLECTING SYSTEM.

1,029,531.

Specification of Letters Patent.

Patented June 11, 1912.

Application filed December 7, 1908. Serial No. 466,294.

To all whom it may concern:

Be it known that I, HENRY L. DAY, of Minneapolis, Hennepin county, Minnesota, have invented certain new and useful Improvements in Dust-Collecting Systems, of which the following is a specification.

This invention relates to improvements in dust collecting systems designed especially for use in connection with grain cleaning houses, in which the grain, dust and lighter material are introduced into the dust collecting system at different points throughout the cleaning house.

The object of my invention is to provide a dust collecting system, into which the tailings from cleaning machines, the floor sweepings, or mixed material from any point, can be introduced and the grain and heavier material separated from the light material at the initial point where the mixed material is received into the system, whereby the handling of the grain and heavy material through the conductors or suction pipes of the system is avoided and, as only the dust and lighter material is taken through the conductors or suction pipes, the fan producing a current of air through the conductors or pipes may be run at a materially reduced speed, thus making a material saving in power.

To these ends, the invention consists in the constructions and combinations hereinafter described and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification: Figure 1 is a plan view of the upper portion of a grain cleaning house having my improved dust collecting system arranged therein. Fig. 2 is a vertical section of the same on line 2—2 of Fig. 1 looking in the direction of the arrow. Fig. 3 is a plan view of the lower part of the house represented in Figs. 1 and 2. Fig. 4 is a vertical section on line 4—4 of Fig. 3 looking in the direction of the arrow. Fig. 5 is a detail of one of the elevator heads.

In all of the drawings, 2 represents the frame of an elevator or grain cleaning house, which may be of any suitable construction, and which is preferably provided with the series of floors 3—3, upon which the various grain cleaning and handling machines or devices are located. It is also provided with the usual bins 4—4. All of these parts may be of any suitable or preferred construction.

5—5 represent grain elevators extending from the bottom to the top of the building and adapted to lift the grain to the top of the building from which point it is conducted to the bins and grain cleaning machinery. Each of these elevators is provided at its lower end with an ordinary boot 6 (see Fig. 4) and at its upper end with a head 7 (see Fig. 5). Suitable grain cleaning machines 8—8 are preferably located on the lower floor of the building below the bins (see Fig. 4) and each of said grain cleaning machines is provided with one or more fans 9 by means of which the dust and light material is drawn away from the grain cleaning machine and conducted to a suitable dust collector or separator 10 through a suitable pipe or conductor 11. A dust collecting system is provided by means of which the dust and light material from the dust collector 10 and from any other devices or mechanisms of the grain cleaning house is conducted to a separator 14 which may be located with furnace feeder connections to deliver such dust or light material to a suitable furnace to be used as fuel. The separator 14 may be located at any convenient point and the dust or light material separated therein, instead of being used for fuel, may be used for feed or for any other purpose, or may be disposed of in any suitable manner.

Under my present improvements I provide means whereby any grain, or similar material, that enters the dust collecting system at any point in the grain cleaning house is immediately separated from the dust and light material, at the initial point where it enters the system, so that only the dust and light material is passed through the conductor of the system, to its final destination. In Fig. 3 of the drawings, 15 represents a suitable fan to which is connected a conductor 16. This conductor may have many branches and is adapted to receive the light material from all of the dust collectors 10 and from all of the other intake devices of the system. From the fan 15 a conductor 17 extends preferably to the dust collector 14, or it may, if preferred, extend to any other suitable dust collector, separator or other device. Upon one of the upper floors of the building, I also arrange a second fan 18 to which is connected a conductor 19 and from which a conductor 20 extends to a dust collector or separator 21, and a discharge

pipe 22 extends from the dust collector 21 to the lower part of the building and connects with the conductor 16. The conductor 19 is provided with various branches extending to different connections, where dust is received, such as cleaning machines, garners, elevator-heads, belt hoppers, or floor-sweeps, which may be located upon the same floor with the said conductor 19, or at other points in the building; among said branches of the conductor 19 are the pipes or conductors 24 extending downward through any desired number of the floors 3 of the building. In the practical operation of a grain cleaning house of this type, it is found that more or less grain becomes scattered upon the various floors of the building. The only practical way to save this grain is to sweep it up. In so doing, more or less dust and dirt becomes mixed therewith. I, therefore, prefer to provide upon each floor one or more "floor-sweeps" 23, each consisting of a conductor having an open lower end, preferably resting upon the floor 3 and into which grain, dust, etc., may be swept. Each of said "floor-sweeps" is also connected at its upper end to the vertical branch conductor 24, hereinbefore described, and each of said "floor-sweeps" is also provided at a point between its open end and its union with the conductor 24 with an expansion or separating chamber 25. I do not, in this application, limit myself to any particular construction for the "floor-sweeps" or "separators" and the "floor-sweeps" and "separators" herein shown I have claimed specifically in separate applications executed of even date herewith.

I also provide a branch pipe or conductor 26 from the outlet end of each of the dust collectors 10, which extends to and connects with the main conductor 16 (see Fig. 3). A separator 27 is also provided below each of said dust collectors and at the intake end of each branch conductor or pipe 26. Similar branch conductors may extend from each grain cleaning machine, or each garner, or from the head of each elevator, or the boot of each elevator, either to the conductor 19, located upon one of the top floors of the building, or to the conductor 16 located upon one of the lower floors thereof. It will be noted that, in each instance, where grain or heavy material may enter the system with the dust and light material, a separator or expansion chamber is provided at the point where the material enters the dust collecting system, so that grain and heavier material entering said system may be immediately separated from the dust and light material at the initial point where such mixed material enters the dust collecting system, so that only the light material passes into the conductor and is moved therethrough by the fan.

I have shown one embodiment of my invention located upon one of the upper floors of the grain cleaning house and a second embodiment located upon one of the lower floors, or a floor below the grain bins, and I have shown the structure located upon one of the upper floors of the building connected with and discharging the light material taken up thereby into the main conductor in the lower structure constituting the second embodiment of the invention. It will be understood, however, that I do not necessarily connect one of these structures with the other, nor do I necessarily employ them both in the same building. Either the structure herein shown located upon one of the upper floors of the building, above the grain bin, or that located upon one of the lower floors, or below the grain bins, is a complete embodiment of this invention, and the two structures may be used together or either one may be used independently.

This structure is of the utmost importance, particularly in the great saving of power that is effected by its use. This could not be accomplished if at any point in the system the grain or heavy material entered the system with the dust or light material, as the greater power would be required to move such unseparated grain or heavy material, and whatever power is required to move the material in one part of the system must also be employed throughout the system. My system may, therefore, be designated and regarded as a "low-pressure" or "low-power" system.

I do not limit myself to the details of the structure herein shown and described, as the same may be varied in many particulars without departing from my invention, the essential feature of which consists in providing a dust collecting system into which the mixed material may be delivered at different points in the system, with a separator arranged at each of said intake points, between the inlet and the conductor, whereby the grain and heavier material may be separated from the lighter material at the initial points where the mixed material enters the dust collecting system, so that only the light material is passed into and through the main conductor.

I claim as my invention:

1. The combination, in a dust-collecting system, with a suitable conductor, and a fan arranged to create a current of air through said conductor, and a suitable dust receiving chamber into which the air-current and the material carried thereby is discharged by said fan, of a series of inlet openings connected with the said conductor, whereby grain, dust and like mixed material may be delivered to the dust collecting system at different points, and a separator arranged between each of said inlet openings and the

conductor substantially at the initial point of entry of heavy and light material into the dust collecting system, whereby the grain or heavier material may be separated at the initial points where it enters the dust collecting system, and only the light material pass into and through the conductor.

2. The combination, in a dust collecting system, with a suitable conductor, of a series of separators connected with said conductor at different points substantially at the initial points of entry of grain and light material into the dust collecting system, and means arranged to create a current of air through said conductor and through each of said separators, means for conducting mixed grain and dust, or similar mixed material, into each of said separators wherein the heavy material is separated from the light material and the light material is carried off by the air-current into and through said conductor, substantially as described.

3. The combination, in a dust collecting system, with a suitable main conductor and a fan arranged to create a current of air through said main conductor, of a floor-sweep formed with an inlet opening for grain and relatively light material and provided with a separating chamber substantially at the initial point of entry of grain and light material into the dust collecting system and connected with said conductor, and into which floor-sweep grain, dust and like material may be swept, and the dust and light material delivered to said main conductor, while the grain and heavier material is separated and deposited in said separator.

In witness whereof, I have hereunto set my hand this 13th day of October, 1908.

HENRY L. DAY.

Witnesses:

C. G. HANSON,
J. A. BYINGTON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."