No. 619,844. Patented Feb. 21, 1899.

J. K. SHARPE, JR.

VENT DEVICE FOR PNEUMATIC ELEVATORS.

(Application filed May 16, 1898.)

(No Model.)

Fig. 1.

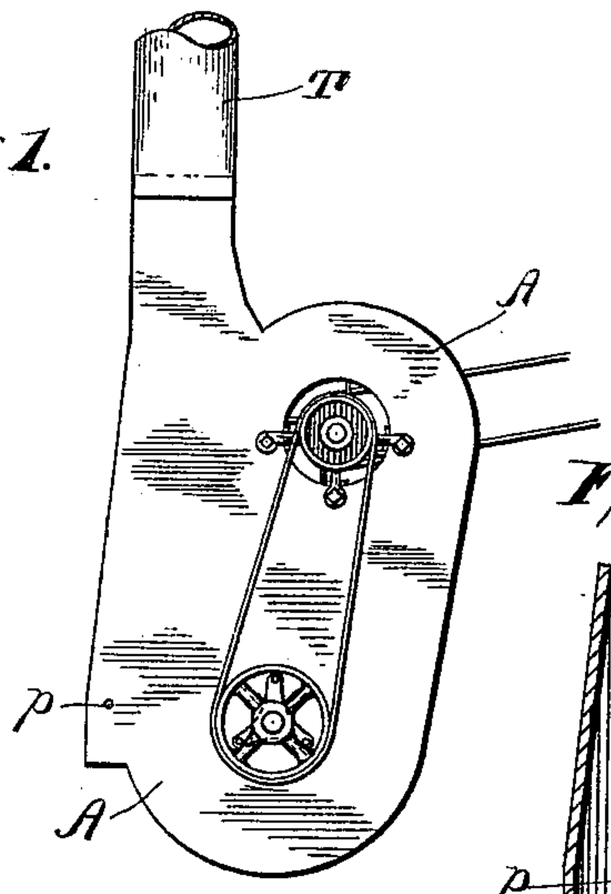


Fig. 2.

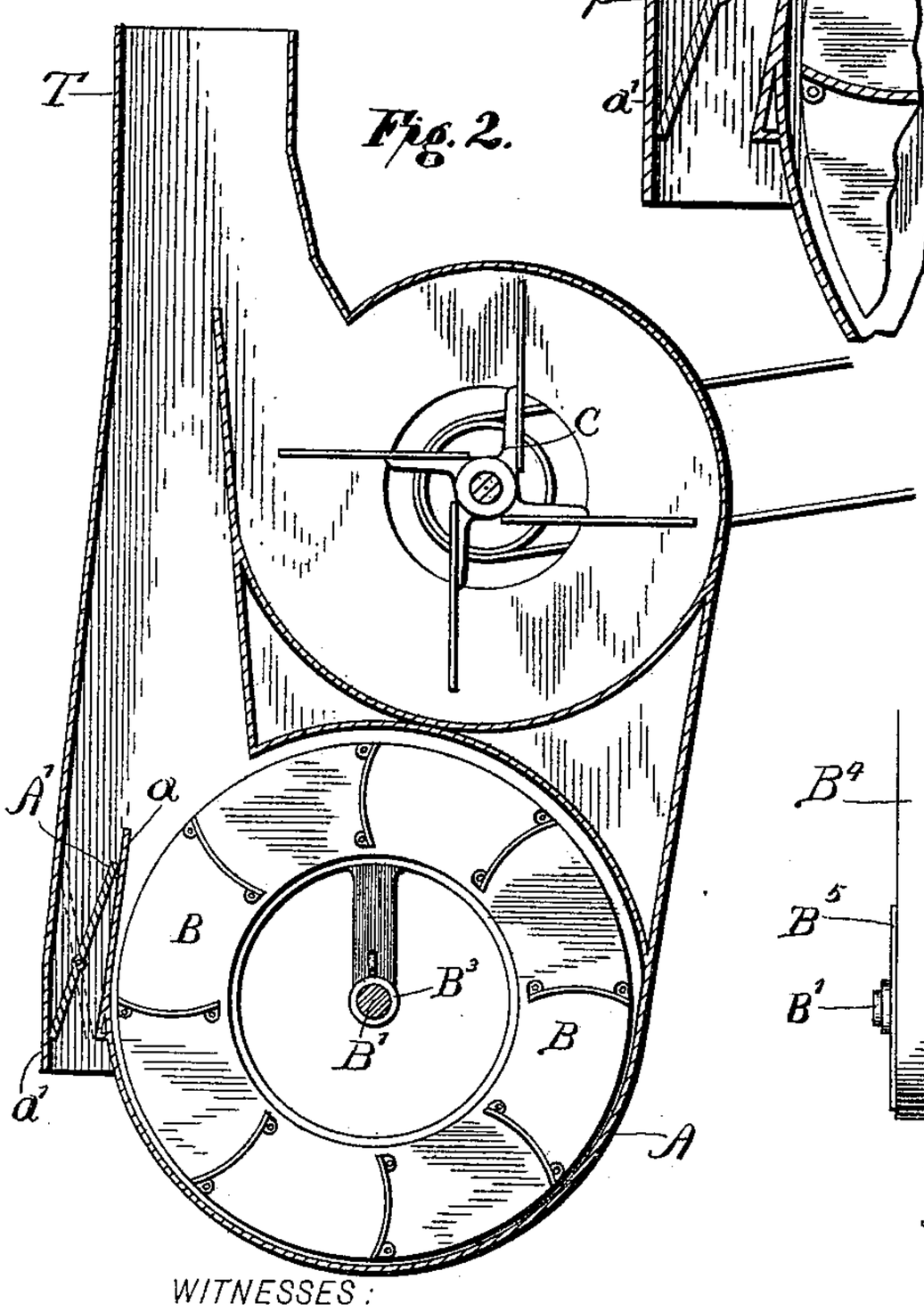


Fig. 3.

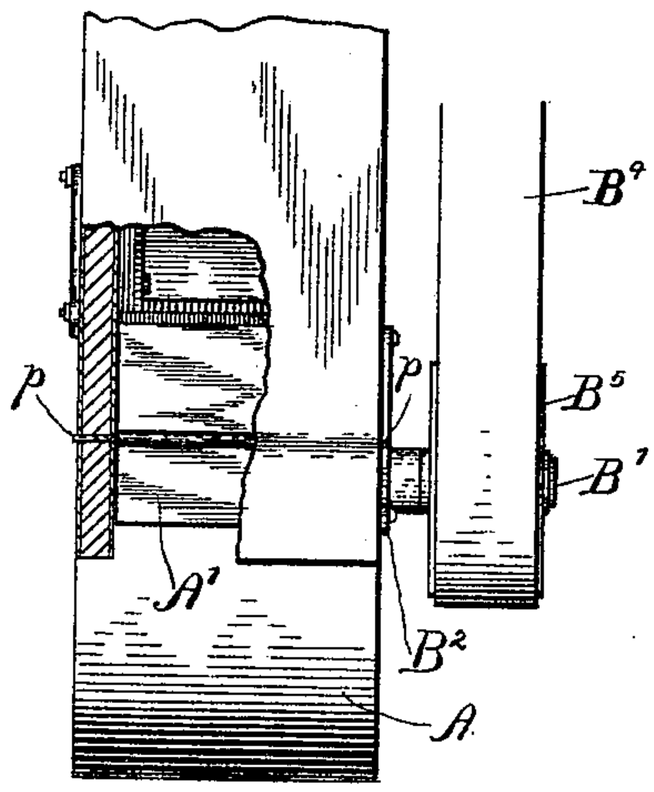


Fig. 5.

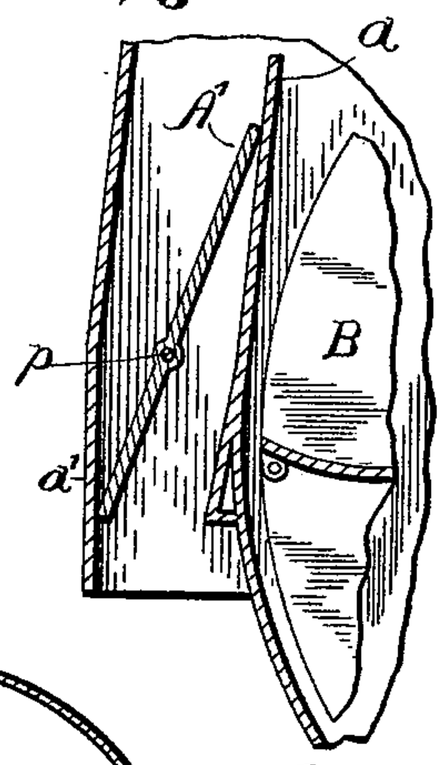
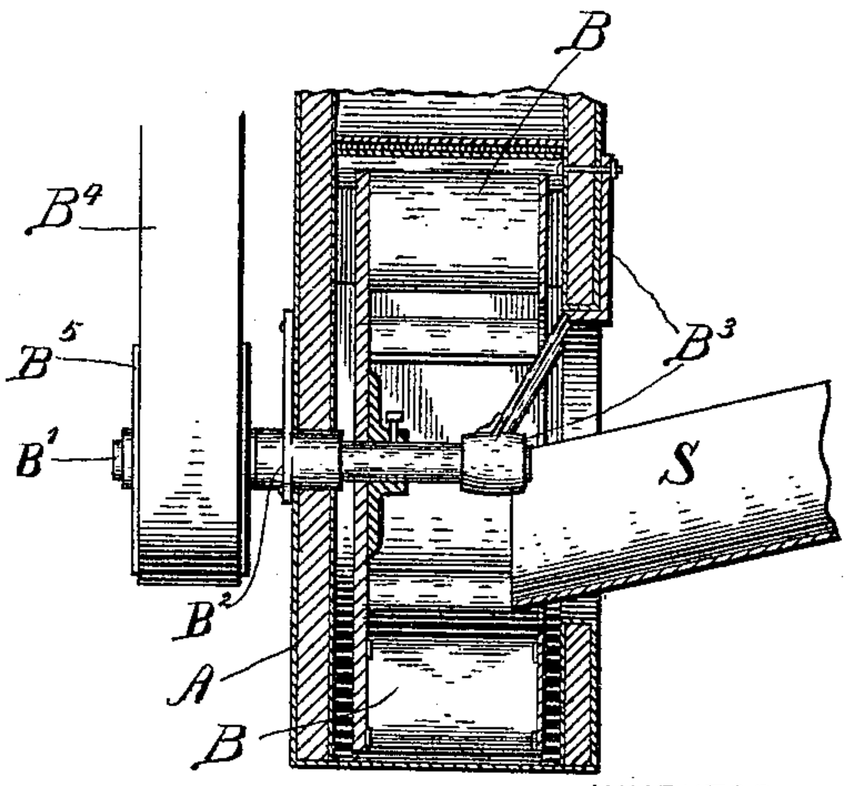


Fig. 4.



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JOSEPH K. SHARPE, JR., OF INDIANAPOLIS, INDIANA, ASSIGNOR TO THE PNEUMATIC ELEVATOR AND WEIGHER COMPANY, OF SAME PLACE.

VENT DEVICE FOR PNEUMATIC ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 619,844, dated February 21, 1899.

Application filed May 16, 1898. Serial No. 680,784. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH K. SHARPE, Jr., a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Vent Devices for Pneumatic Elevators, of which the following is a specification.

My present invention is designed to be embodied in a "pneumatic elevator" such as forms the subject-matter of Letters Patent of the United States No. 603,925, issued May 10, 1898, to The Pneumatic Elevator and Weigher Company upon the application to James B. Schuman. In the use of such pneumatic elevators the grain or other material is propelled upwardly through the elevator-tube by the blast of air and is delivered during the time the machine is running at its normal speed at a predetermined point controlled by the length and position of such tube. When, however, as during the stopping and starting of the machine, the speed is slower than normal, the force becomes reduced and is insufficient to propel the material being elevated to the desired point, so that the boot of the elevator is likely to become filled therewith, for the reason that the material-conveying devices will deliver such material, although slowly, as long as they move at all, even when the fan or fans are running too slowly to perform any effective work. Thus during the time of the gradual diminution of speed the blast first becomes overloaded, and then whatever material is delivered into the boot is not lifted at all. Conversely, in starting the elevating-fan or throwing-wheel when it first begins to move has not sufficient speed to throw the material up into the blast produced by the fan, while the material-conveying devices begin to bring material into the boot immediately the machine is started. The elevating-fan or throwing-wheel thus becomes clogged, so that it is difficult to start the machine when it is desired to resume operations.

The object of my present invention is to provide a means of egress for this surplus material, so that the throwing-wheel shall under such circumstances be relieved; and said invention, broadly stated, consists in providing a suitable opening in the rear side of the boot or throwing-fan casing through which such material may be easily discharged, said opening being so arranged and protected as that it shall not interfere with the normal operation of the machine when running at its proper speed.

It further consists in certain details of operation and arrangements of parts, as will be hereinafter more particularly described and claimed.

Referring to the accompanying drawings, which are made a part hereof and on which similar letters of reference indicate similar parts, Figure 1 is a side elevation of the boot and adjacent parts of an elevator to which my invention is applied; Fig. 2, a central sectional view of the same on an enlarged scale; Fig. 3, a rear elevation of the lower portion of the apparatus, a portion of the casing being broken away to show the devices beneath; Fig. 4, a vertical central sectional view through the throwing-wheel and immediately adjacent parts; and Fig. 5, a detail view, on a still further enlarged scale similar, to a portion of Fig. 2.

In said drawings the portions marked A represent the fan-casing or elevator-boot, B the elevating-fan or throwing-wheel, and C the blast-fan.

As above indicated, this apparatus is, generally speaking, meant to be applied to the pneumatic elevator and weigher invented by James B. Schuman and shown and described in the Letters Patent above referred to, although, of course, capable of being applied to other machines. I will not, therefore, describe such a machine particularly, except incidentally and in so far as seems desirable in describing my own invention.

The elevator-boot or fan-casing A has, as heretofore stated, an opening on its rear side, which opening is bounded by the side walls of the boot and by the inner and back walls *a a'*. The wall *a* continues up from the lower portion of the boot to a suitable point above the center of the elevating-fan or throwing-wheel, while the wall *a'* is a continuation of the back side of the elevator-tube and is preferably positioned approximately parallel with and alongside said wall *a*. This arrangement makes an egress-opening which discharges in

a downward direction, while the normal direction of discharge of the material to be elevated is upward. The elevator-tube T is a continuation of the fan-casing or elevator-boot.

Within the egress-opening just described I prefer to locate a tilting gate A′. The pivots *p*, upon which this gate moves and by which it is supported, are below the center thereof, but are centrally positioned in said egress-opening. Said gate, thus being heaviest above the pivot, will normally lie so as to close the opening and form a pocket to receive such material as may be thrown or fall over the wall *a*. When, however, a sufficient amount of material has entered the pocket, the weight of such material added to the weight of that portion of the gate below the pivots will overbalance the upper portion of the gate, so that it will be thrown over to the opposite position, discharging the said material, but forming a corresponding pocket on the opposite side. These pockets are thus alternatively formed upon one side or the other and the accumulated material thus periodically discharged.

The elevating-fan or throwing-wheel B is similar to that shown in the Schuman patent, No. 603,925, above referred to, although somewhat more perfect mechanically, and its shaft B′ is mounted in suitable bearings B^2 and B^3, as shown, and is driven by a belt B^4, running to a pulley B^5 on said shaft B′. The receiving-mouth of the egress-opening in the boot or casing is positioned somewhat above the shaft B′. As will be noticed, the bearing B^3 is inclined inwardly through the eye of the boot or casing to nearly the center of the structure in order to leave free room for the entrance of the ingress-spout S.

The blast-fan C is an ordinary blast-fan, and it operates and is arranged substantially as shown in the aforementioned Schuman patent.

The operation may be stated as follows: When the apparatus is first started and before it attains its proper speed, any material which has been or is during that time thrown into the boot of the elevator into contact with the throwing-wheel will be thrown up somewhat by said throwing-wheel, although with not sufficient force to cause it to be elevated by the apparatus, and will fall over the top of the partition *a* and thence out through the opening provided, as described. When, however, the speed of the machine has reached its predetermined and operative limit, then the material will be thrown past this opening into the blast from the blast-fan C and thence driven on up the elevator-tube T to the weigher or to wherever it is to be conveyed. Escape of air through this egress-opening is effectually prevented by the gate A′, which, as above described, in shifting from side to side forms pockets which receive the grain therein and discharge such grain, pocketful by pocketful, as often as the pockets are filled, while keeping the egress-opening completely closed except at the moment of discharge.

Having thus fully described my said invention, what I claim, and desire to secure by Letters Patent, is—

1. In an elevating apparatus wherein there is an elevating-fan or throwing-wheel whereby the material to be elevated is thrown upwardly from the point of entrance to the apparatus, the combination, with such throwing-wheel, of the boot or casing therefor provided at a point below the outlet therefrom with a vent-opening through which accumulating material which may enter therein while the fan is running at a slow speed may be discharged, as during the starting and stopping of the machine.

2. The combination, with the throwing-wheel of an elevating apparatus, of the casing for such wheel, an elevator-tube leading upwardly from said casing, said casing having an opening at a point near the lower end of said tube, the discharge-mouth of which is directed downwardly, substantially as set forth.

3. The combination, in an elevating apparatus, of the casing therefor, the elevator-tube leading upwardly therefrom, the rear side of said elevator-tube being composed of a double wall with an open space between said walls, the upper end of said space opening into the lower end of said elevator-tube, and the lower end of said space opening to the outside, substantially as and for the purposes set forth.

4. The combination, in a pneumatic elevator, of the elevating-fan or throwing-wheel, the casing or boot therefor having a vent-opening in the rear side for the discharge of material which might otherwise clog said elevating-fan or throwing-wheel, and a tilting gate positioned within said opening and adapted as it shifts from side to side to form together with the sides of said opening pockets for the reception of the material to be discharged.

5. The combination, in a pneumatic elevator, of the elevating-fan, the casing or boot therefor, a vent or discharge opening in the rear side thereof formed by the side walls of the boot and inner and back walls *a a′*, and a pivoted gate A′ positioned within said opening and having its supporting-pivots arranged below the center thereof, substantially as and for the purposes set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 10th day of May, A. D. 1898.

JOSEPH K. SHARPE, JR. [L. S.]

Witnesses:

CHESTER BRADFORD,

JAMES A. WALSH.