No. 608,014. Patented July 26, 1898.

D. M. THOM.

COMBINED FEED CUTTER AND BLOWER.

(No Model.) (Application filed Dec. 30, 1897.)

2 Sheets—Sheet 1.

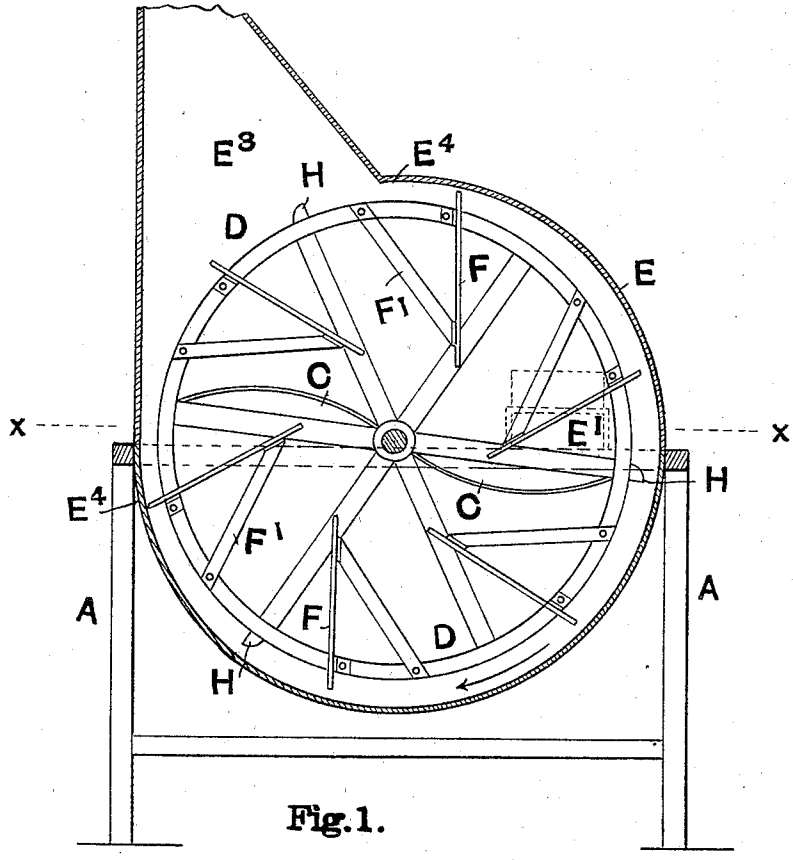


Fig. 1.

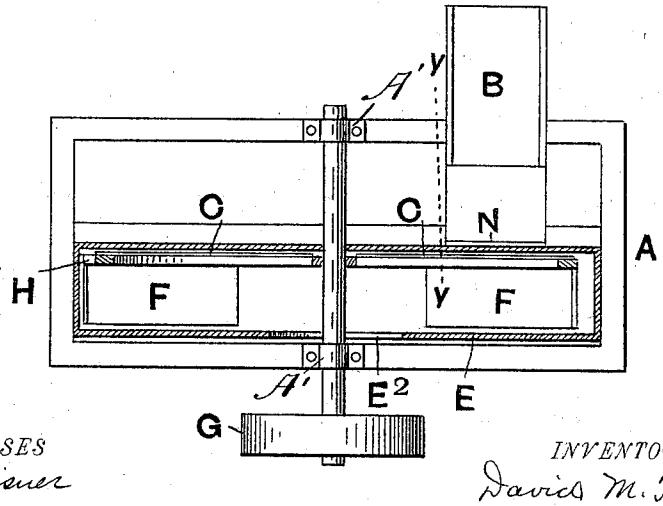


Fig. 2.

WITNESSES

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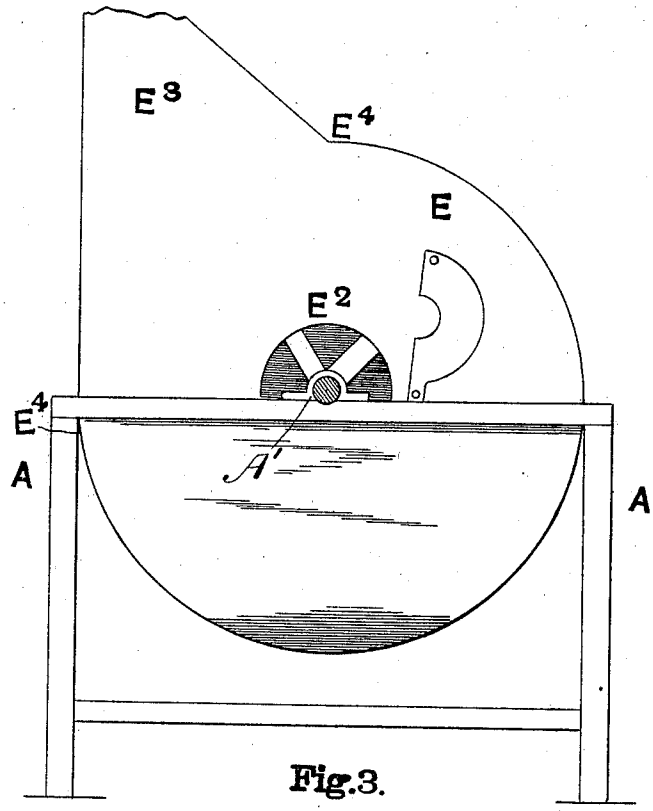
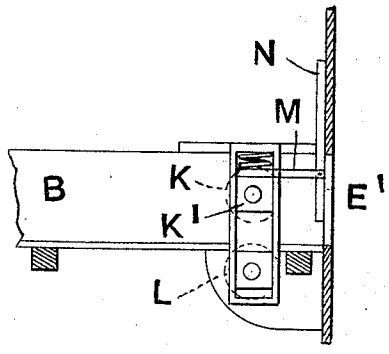


Fig.3.

Fig.4.



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UNITED STATES PATENT OFFICE.

DAVID M. THOM, OF WATFORD, CANADA.

COMBINED FEED-CUTTER AND BLOWER.

SPECIFICATION forming part of Letters Patent No. 608,014, dated July 26, 1898.

Application filed December 30, 1897. Serial No. 664,635. (No model.)

To all whom it may concern:

Be it known that I, DAVID M. THOM, a citizen of Canada, residing at Watford, county of Lambton, Province of Ontario, Canada, have invented a certain new and useful Improvement in a Combined Feed-Cutter and Blower; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to the process of elevating cut ensilage and to blast elevating apparatus, and more particularly refers to effectually elevating cut cornstalks for filling silos, &c.; and it consists in the peculiar process, arrangements, and combinations hereinafter described and claimed.

In the drawings, Figure 1 is a vertical elevation, partly in section, showing a side view of the fan-wheel, its casing in section, and also the delivery-chute in section, through which the material is forced. Fig. 2 is a horizontal sectional view on line *x x* of Fig. 1, except the delivery-chute and driving mechanism. Fig. 3 is a side elevation showing the air-inlet. Fig. 4 is a transverse vertical section of the feed-inlet, with side view of the feed-chute and automatic shutter for preventing the escape of air at the feed-opening.

Certain unimportant details are omitted, as they are common to all blowers, are well known in the art, and are not of the essence of this invention.

Similar letters refer to similar parts.

In the drawings, A represents a framework designed to support the apparatus.

B is a chute into and through which the uncut material is fed to the knives C C, which are carried and radially arranged on the wheel D. This wheel consists of a solid rim D′, which, as shown in Fig. 2, is located on one side of the casing E, which surrounds it. The wheel is an open one, the blades C C being on spokes sustaining the rim, as C′. The wheel is journaled at A′ A′ upon the upper portion of the frame A and is cased entirely in the casing E, which has only three openings—one, E′, for the introduction of the uncut material, as shown in dotted lines in Fig. 1 and in section in Fig. 4 on line *y y*, another central opening upon the opposite side of the casing concentric above the axle, as shown in Fig. 3, for the admission of air and marked E^2, and the delivery-chute opening E^3.

F F are fan-blades the outer ends of which are attached to but project slightly beyond the rim D′ of the wheel D and the inner ends carried by brackets F′. It will be noted that these fan-blades are not radially arranged, but that their inner ends, which do not project to and are not in contact with the hub, are in advance of a radial line to the rim at the point of their attachment. As shown in Fig. 1, the casing E is so arranged that the ends of these fans run quite closely to it and at E^4 very closely indeed. This is in connection with slight projections H H, which are arranged upon the periphery of the wheel, which have an outer scraping edge in the line of the direction of the revolution, the direction of revolution being shown by the arrow in Fig. 1.

In Fig. 4, K represents the upper feed-roller, and L the lower feed-roller, these rollers being arranged and journaled in the usual manner in such devices, K′ being the bearing-spring, controlled in a vertical slot in the frame, permitting the rollers to separate. As this is old, a detailed description is unnecessary. E′ is the feed-opening into the casing E. N is a shutter having a vertical movement, attached to the end of a pair of arms M, only one of which is shown, the arms being rigidly attached to the movable bearing of block K′. As the shutter does not extend lower than substantially the lower face of the roller K, and as the lower roller L projects but slightly above the floor of the chute B, and as the lower edge of the shutter N is substantially flush with the lower face of the upper roller K, it follows that the opening into the casing below the shutter will substantially correspond with the distance between the rollers, and as the material to be cut is compressed between the rollers and is fed through this opening the material itself acts to substantially seal the opening against the egress of any air, and thus prevents it from being driven from the casing through the feed-opening. It is obvious that the open-

ing will automatically enlarge or diminish as the layer of material passing between the rollers is thinner or thicker.

The fans and scraping edges obviate a difficulty which would otherwise exist, and that is, the packing of vegetable gum upon the casing to such an extent as to virtually jam the wheel in the casing, the sharp edges of the projections H continually scraping off the gum as fast as it is formed. This is of great importance, as has been found by experience. The mouth E^3 of the delivery-chute is conically formed in the direction of the plane of the casing, as shown in Fig. 1, and this very much facilitates the entrance and forcing of the coarse-cut cornstalks and material therefrom up through the chute.

The chute B delivers the uncut corn directly to the knives of the wheel, as the ordinary rotary corn or feed cutters do, the feed being forced or controlled in the usual manner by spring-controlled roller K and fixed roller L. An arm M, attached to the movable bearing K′, carries a shutter N, which operates to automatically close the upper portion of the delivery-opening E′, and thus to adjust it to the proper size for the admission of the uncut stalks, but prevent undue enlargement and escape of air above the uncut material. The wheel is driven by any appropriate means, as by the band-wheel G, and any convenient source of power.

The mode of operation of this device is as follows: The wheel being put into appropriate motion by reason of the fans F F and the construction of the casing operates as a strong blower, forcing a strong blast of air up through the chute E^3. Corn or other material being fed through the chute B is cut by the knives C C during such revolutions into longer or shorter lengths in proportion as it is fed in. Falling into the open wheel forward of the fans it is carried downward, then upward, and, finally, by both the action of centrifugal force and the air-blast thrown into and up through the chute E^3, and may be carried to a considerable height and distance, and thus delivered directly to a silo or other desired receptacle.

In order to utilize the centrifugal force and the air-blast in combination to perform the function described of elevating cut corn, I have found that the particular elements of the advancement of the inner ends of the blades and the close running of the wheel in the casing are essential features. It is also essential that the escape of air be avoided as far as possible. Another essential feature is the enlarged lower end of the chute and its tangential direction with reference to the casing. I have found that with an air-blast and the centrifugal force combined heavy material, as cut green corn, is successively elevated from thirty to forty feet, while with centrifugal force alone or an air-blast alone it not only cannot be elevated to the same extent, but with very much less elevation requires nearly double the power. I know of no apparatus of like character in which the live forces are so combined for a similar or analogous purpose, and I do not therefore desire to be limited to specific forms or details only so far as the same are essential to the coöperation of the two forces.

What I claim is—

1. In a combined feed-cutter and blower, consisting of a fan-wheel having fan-blades and carrying knives revolving in a cage, and having an air-inlet and a delivery-pipe, radial scrapers attached to the periphery of the wheel and running closely within the fan-case, and adapted to cut off the vegetable gum forming thereon as fast as the same is formed, substantially as described.

2. In a combined blower and feed-cutter, the combination of a fan-wheel having fan-blades, the inner faces of which are located in advance of a radial line, an air-inlet and an air-outlet located in the upper portion of the said fan-case, said outlet being funnel-shaped in form in the direction of the plane of the fan-case, a multiplicity of scrapers attached to the periphery of the wheel and adapted to scrape off vegetable gum that may form upon the interior of the casing, substantially as described.

3. In a combined cutter and blower, the combination of adjustable feed-rollers adapted to deliver articles to the cutter and blower casing, a casing having an opening therein to admit the articles operated upon, an adjustable shutter to said opening, and means whereby said shutter is operated by the adjustable roller in such manner as to enable the opening in the casing to substantially conform to the amount of material between the rollers delivered to such opening, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

DAVID M. THOM.

Witnesses:
R. A. PARKER,
MARION A. REEVE.