(No Model.) 2 Sheets—Sheet 1.

J. R. BEYNON.

ELEVATOR AND CLEANER FOR GRAIN, &c.

No. 459,570. Patented Sept. 15, 1891.

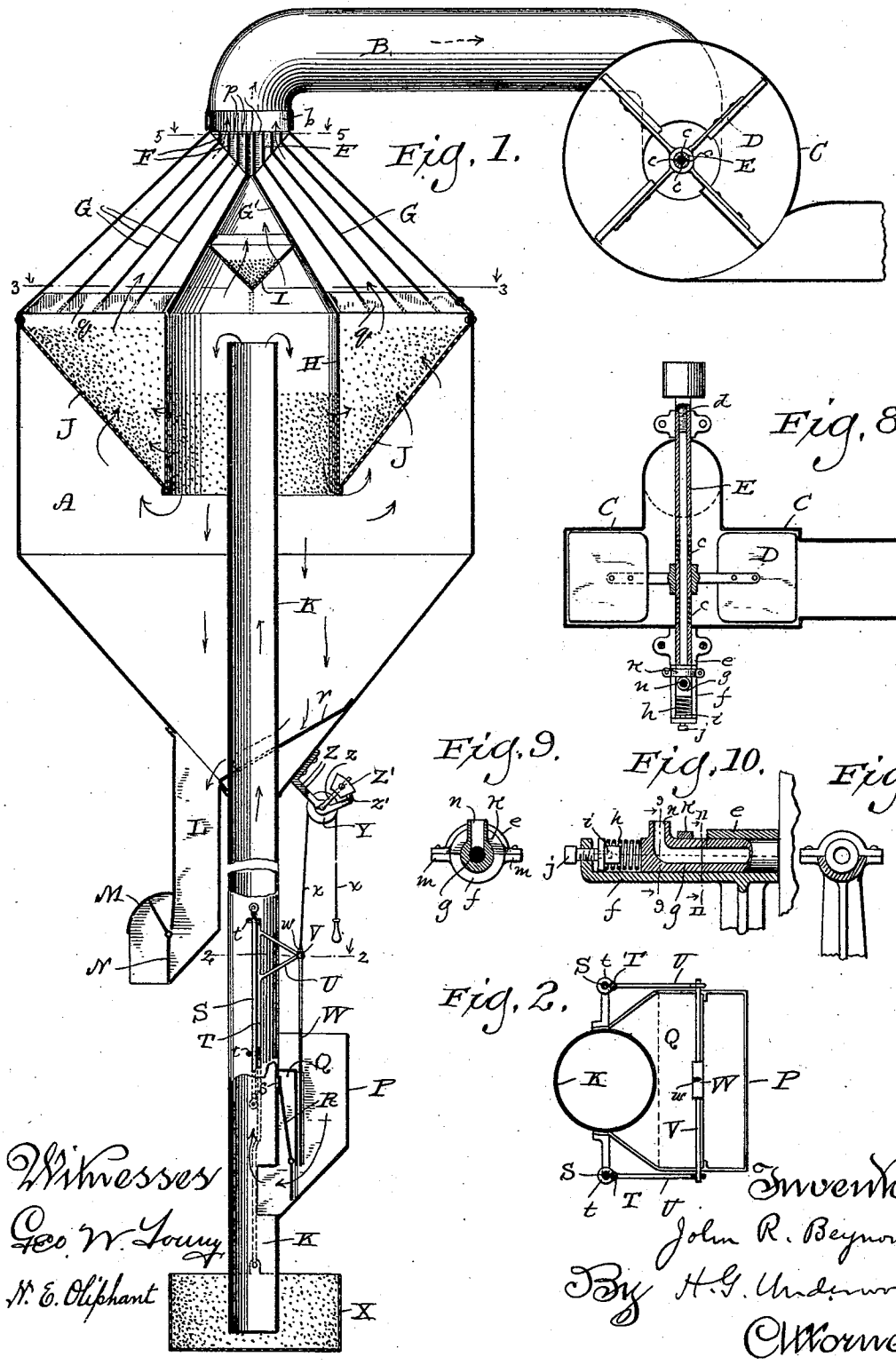


Fig. 1.

Fig. 8.

Fig. 9.

Fig. 10.

Fig. 11.

Fig. 2.

Witnesses
Geo. W. Young
N. E. Oliphant

Inventor
John R. Beynon
By H. G. Underwood
Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

J. R. BEYNON.

ELEVATOR AND CLEANER FOR GRAIN, &c.

No. 459,570. Patented Sept. 15, 1891.

Fig. 3.

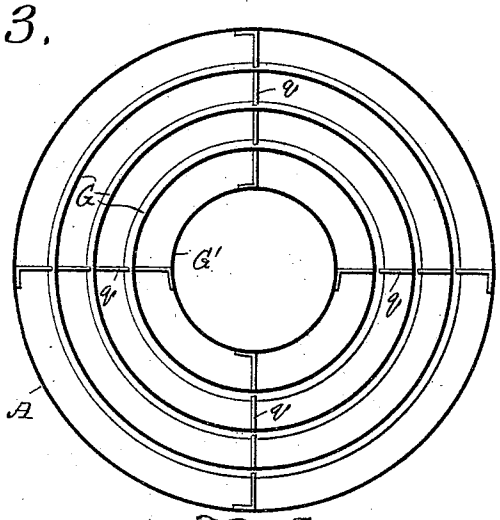


Fig. 7.

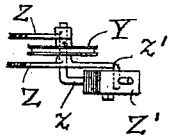


Fig. 5.

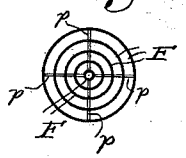


Fig. 6.

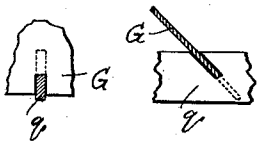
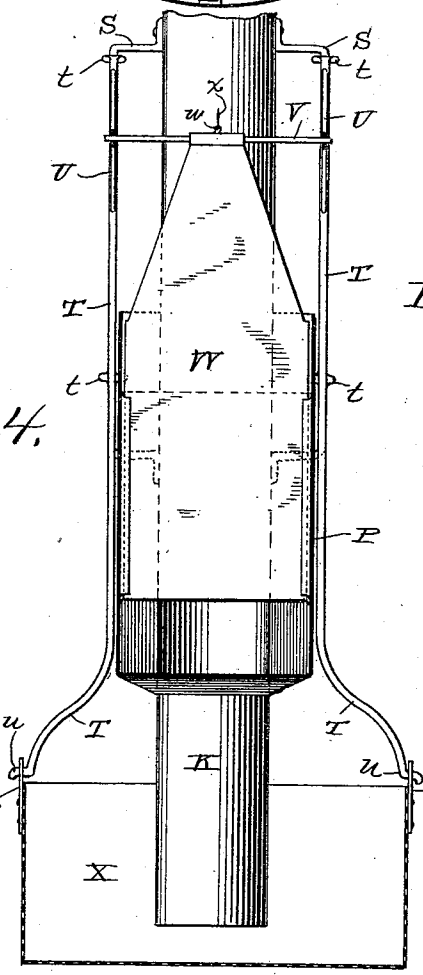


Fig. 4.



Witnesses
Geo. W. Young.
N. E. Oliphant

Inventor
John R. Beynon
By H. G. Underwood
Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN R. BEYNON, OF WATERTOWN, WISCONSIN, ASSIGNOR OF ONE-HALF TO JAMES B. MURPHY, OF SAME PLACE.

ELEVATOR AND CLEANER FOR GRAIN, &c.

SPECIFICATION forming part of Letters Patent No. 459,570, dated September 15, 1891.

Application filed April 22, 1891. Serial No. 389,912. (No model.)

To all whom it may concern:

Be it known that I, JOHN R. BEYNON, a citizen of the United States, and a resident of Watertown, in the county of Jefferson, and in the State of Wisconsin, have invented certain new and useful Improvements in Elevators and Cleaners for Grain, &c.; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention has for its object the elevation and cleaning of grain or analogous material; and it consists in certain peculiarities of construction and combination of parts to be hereinafter described with reference to the accompanying drawings and subsequently claimed.

In the drawings, Figure 1 represents a vertical transverse section of my improved elevating and cleaning mechanism. Figs. 2 and 3 horizontal sections taken on lines 2 2 and 3 3, respectively, of the preceding figure; Fig. 4, a detail elevation, partly in vertical transverse section, to better illustrate a sliding gate or cut-off for an opening in an outer wall of a valve-casing embodied in my improvement; Fig. 5, a horizontal section on line 5 5 of Fig. 1; Fig. 6, a detail of the joint between certain portions of said mechanism; Fig. 7, a detail plan view of a pulley and weight mechanism forming part of my invention; Fig. 8, a horizontal section of a fan and sprinkling mechanism also forming part of my invention; Fig. 9, a section on line 9 9 of the succeeding figure; Fig. 10, a detail sectional view of a portion of the fan and sprinkling mechanism, and Fig. 11 a section on line 11 11 of the preceding figure.

Referring by letter to the drawings, A represents a casing made conical at both ends and provided at its upper end with a flange *b*, over which is fitted a flue B, leading to the casing C of a suction-fan D, the shaft E of the latter being preferably hollow and provided with perforations *c* intermediate of the blades. One end of the hollow fan-shaft is closed by a plug *d*, as shown in Fig. 8, this plug being screw-threaded or otherwise retained in said shaft. The opposite end of the hollow fan-shaft is shown as supported in a bearing *e*, having a recessed extension *f*, in which is placed a hollow block *g*, the latter being held against said shaft by means of a spiral spring *h*, supported on a flanged stud *i* and adjustable as to tension by means of a set-screw *j*, as best illustrated in Fig. 10. The hollow block *g* is held in the bearing-extension *f* by means of a clamp *k*, bolted to wings *m* on said bearing-extension, and said block is provided with a nozzle *n* for connection with a water-pipe or hose, this construction being well shown in Figs. 9 and 10. It is to be understood that the hollow block *g* remains stationary against the rotating hollow fan-shaft E, and the spring *h*, expanding against said block, holds it tight against said shaft and serves to compensate for wear between the parts.

Depending within the open upper end of the casing A is a series of concentric rings F of gradually-increasing depth toward the center, these rings being stiffened by braces *p* and joined to a series of concentric cones G, all but the center one G′ of which have a notching fit with stiffening-braces *q*, as best illustrated in Figs. 1, 3, and 6. The spaces between the concentric cones and rings above described serve as air-passages that lead to the flue B in communication with the fan-casing, and the inner one of said rings forms a tubular extension at the apex of the inner cone G′, the latter being of itself an extension of a cylinder H, having a perforated lower portion and open lower end. Arranged within the cone G′ is an inverted and perforated cone I, and extending from the lower end of the cylinder H to the casing A is an inclined and perforated apron J, the latter being clearly illustrated in Fig. 1.

Extended up through the lower end of the casing A to a point within the cylinder H above the perforated portion thereof is a flue K, the latter being straddled within said lower end of the casing by an inclined delivery-guard *r*, leading to a depending spout L, the lower end of the latter being provided with a hood M, in which is pivoted a valve N, that normally closes the outlet of the spout. That portion of the valve N above its pivot extends outward at an angle to a vertical line and presents a surface of less area than the remaining portion below the pivot, said valve and the hood M being similar to like parts set

forth in my Patent No. 407,052, of July 16, 1889. At some point in its length, but preferably near the lower end, the flue K is provided with an opening communicating with a hopper P, the latter being provided with a casing Q for a pivoted valve R, this valve being similar in general construction to the one N above described. Like in the patent heretofore mentioned, the vertical portion of the valve R normally closes an opening in the outer wall of its casing and is of less area than the angular portion, the latter serving to normally close an opening *s* in the flue K, this flue forming the inner wall of said valve-casing.

Bolted or otherwise suitably secured to the exterior of the flue K, on opposite sides of the same, are vertical guide-rods S for engagement with eyes *t* on other rods T parallel therewith, these latter rods being provided with brackets U for the support of a horizontal rod V, on which is hung a gate W, that is designed to control the opening in the outer wall of the casing Q for the valve R, above specified. The vertical rods T are bent outward at their lower ends and terminated in hooks or studs *u*, designed for engagement with vertical ears *v* on a perforated receptacle *x*, as best illustrated in Fig. 1, and connected to an eye *w* on the gate W is a cord or other flexible device *x*, that is run over a grooved pulley Y, journaled in arms Z on the lower end of the casing A, one journal of the pulley being in the form of a crank *z* for the support of a weight Z′, limited as to throw in one direction by said casing and in the other by a stop *z*′ on the upturned end of one of said arms.

In practice the flexible device *x* is actuated to elevate the hopper-gate W and receptacle X, the weight Z′ being thrown over against the stop *z*′ when this operation takes place. The gravity of the gate and receptacle being overbalanced by the weight Z′, the flexible device *x* is wedged in the grooved pulley Y to thereby lock said gate and receptacle in their adjusted position, as shown in Fig. 1. Grain or analogous material spouted into the hopper P falls against the lower vertical portion of the valve R, the latter being normally held in its closed position by the suction of the fan D, exerted on the angular portion thereof through the opening *s* in the flue K, and at any time the material rises above the opening in the outer wall of the valve-casing Q the suction will be cut off from said angular portion of the valve and exerted entirely upon the vertical portion in concert with the weight of said material, thereby causing said valve to tilt on its pivot and allow the accumulated material to enter said flue. The suction of the fan draws the material up the flue K, and as this material passes out at the upper end of said flue it enters an area of such dimensions that the power of the suction is overcome and said material of its own gravity falls down through the open lower end of the cylinder H into the casing A, this fall of the aforesaid material being retarded by the draft through the perforated apron J and perforated lower portion of said cylinder. The suction of the fan D through the air-passages, formed by the concentric rings F and cones G G′, is sufficient to free the material from dust, bran, or other light particles, and these particles being carried into the fan-casing are precipitated by a spray of water discharged through the perforated hollow shaft of said fan and carried off with the water to a place of deposit by suitable spouting. The air-passages from the casing A to the fan-flue being inclined and tapering, the dust and fine particles have little or no chance to lodge and consequently these passages will not become clogged. Any light grain or material that may be carried above the flue K is turned back by the apron J, and all the cleaned material falling into the casing A is conducted by the inclined guard *r* to the spout L, by which it is conducted down against the valve N until by the accumulation of said material against the lower vertical portion of said valve cuts off the suction thereon and causes the draft to be exerted on the angular portion of the aforesaid valve. The diversion of the suction to the angular portion of the valve and the weight of the material accumulated against the vertical portion of the same cause said valve to open and discharge said material. If at any time the action of the fan should weaken or stop, the material in the flue K will descend into the receptacle X to thus overcome the weight Z′, whereby the latter is swung over toward the casing A to permit the descent of said receptacle and the gate W, the latter cutting off the flow of material from the hopper to said flue

It is preferable to employ the receptacle X and to spout the material to be elevated and cleaned into the hopper P when the apparatus above described is used in a mill; but said receptacle may be detached and the hopper-gate W shut down. In the latter instance the lower end of the flue K will be connected to a pipe leading into a car, ship-hold, or other space containing the material to be treated.

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

1. The combination of a casing having its upper portion in communication with a suction-fan and its lower portion provided with a valve-controlled discharge-opening, a cylinder having a perforated lower portion and open lower end depending within the casing, and a flue extended up through said lower portion of the casing to a point beyond the perforated portion of the cylinder, substantially as set forth.

2. The combination of a casing having its upper portion in communication with a suction-fan and its lower portion provided with a valve-controlled discharge-opening, a cylin-

der having a perforated lower portion and open lower end depending within the casing, a flue extended up through the lower end of the casing to a point beyond the perforated portion of the cylinder, and a deflector arranged above the upper end of the flue, substantially as set forth.

3. The combination of a casing having its upper portion in communication with a suction-fan and its lower portion provided with a valve-controlled discharge-opening, a cylinder having a perforated lower portion and open lower end depending within the casing, a perforated inclined apron connecting the lower end of the cylinder with the casing, and a flue extended up through the lower end of said casing to a point beyond the perforated portion of the cylinder, substantially as set forth.

4. The combination of a casing having its upper portion in communication with a suction-fan and its lower portion provided with a valve-controlled discharge-opening, a cylinder having a perforated lower portion and open lower end depending within the casing, a flue extended up through the lower portion of said casing to a point beyond the perforated portion of the cylinder, and a hopper having a valve-controlled exit into the flue, substantially as set forth.

5. The combination of a casing having its upper portion in communication with a suction-fan and its lower portion provided with a valve-controlled discharge-opening, a cylinder having a perforated lower portion and open lower end depending within the casing, a flue extended up through the lower portion of said casing to a point beyond the perforated portion of the cylinder, a hopper having a valve-controlled exit into the flue, and an adjustable gate for said exit, substantially as set forth.

6. The combination of a casing having its upper portion in communication with a suction-fan and its lower portion provided with a valve-controlled discharge-opening, a cylinder having a perforated lower portion and open lower end depending within the casing, a flue extended up through the lower portion of said casing to a point beyond the perforated portion of the cylinder, a hopper having a valve-controlled exit into the flue, guide-rods fast to said flue, slide-rods having eyes engaging the guide-rods and provided with brackets connected by a horizontal rod, a perforated receptacle connected to the slide-rods, a gate for the hopper-exit depending from the horizontal rod, a grooved pulley having a cranked journal provided with a weight, and a flexible device connected to said gate and run over the pulley, substantially as set forth.

7. The combination of a casing having its upper portion provided with a series of concentric rings and cones spaced apart to form air-passages, a suction-fan in communication with the air-passages, a valve-controlled outlet for the casing, a cylinder depending from the center cone and having a perforated lower portion and open lower end, and a flue extending up through the lower portion of said casing to a point beyond the perforated lower portion of the cylinder, substantially as set forth.

8. The combination of a casing having its upper end in communication with a suction-fan provided with a hollow perforated shaft, suitable means for conveying water to the fan-shaft, a cylinder having a perforated lower portion and open lower end depending within the casing, a flue extended up through the lower portion of said casing to a point beyond the perforated portion of the cylinder, and a valve-controlled outlet for the aforesaid casing, substantially as set forth.

9. The combination of a suitable casing, a flue leading thereto, a fan arranged in the casing and provided with a hollow perforated shaft, and suitable means for conveying water to said fan-shaft, substantially as set forth.

10. The combination of a suitable casing, a flue leading thereto, a fan arranged in the casing and provided with a hollow perforated shaft, a bearing for the fan-shaft provided with an extension, and a spring-controlled hollow block retained in the extended bearing to impinge against said fan-shaft, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Watertown, in the county of Jefferson and State of Wisconsin, in the presence of two witnesses.

JOHN R. BEYNON.

Witnesses:
C. B. SKINNER,
C. R. BLUMENFELD.