5 Sheets—Sheet 1.

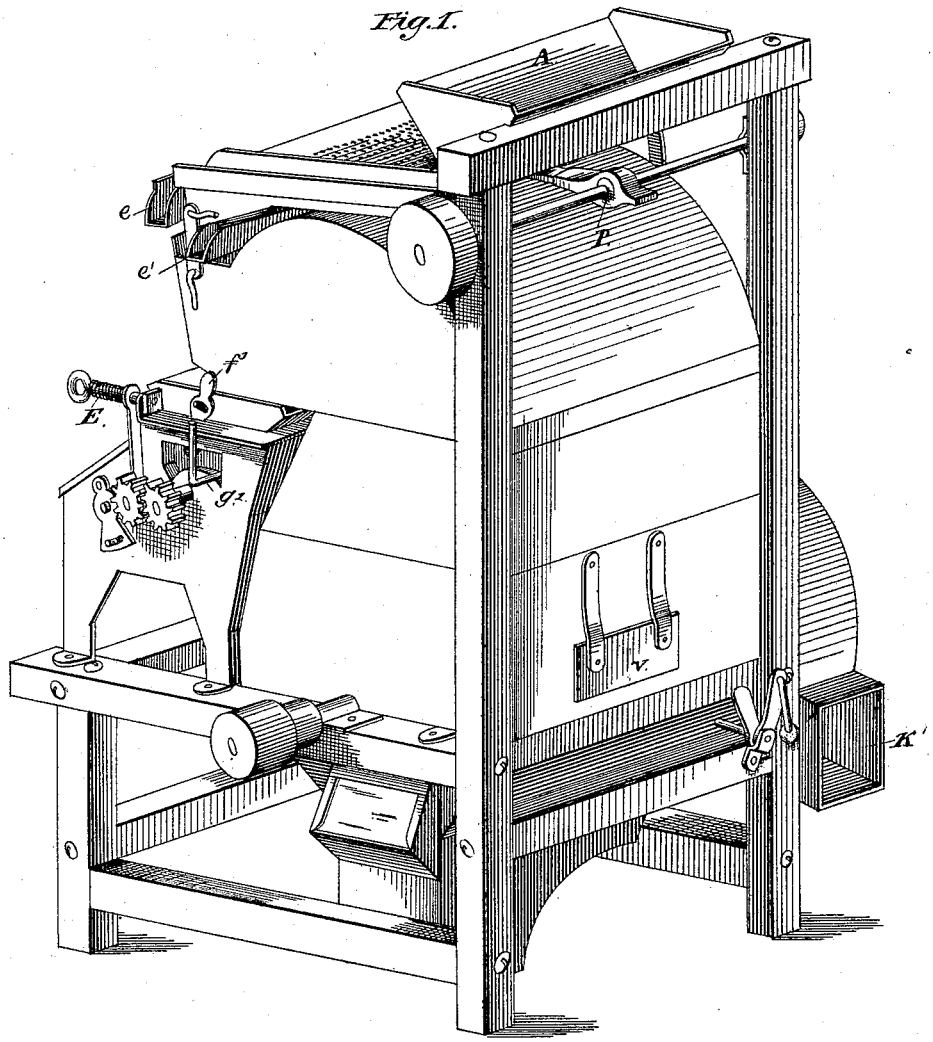
S. W. ANDREWS & L. GODFREY.

S. W. ANDREWS, deceased; L. GODFREY, administrator.

BLAST GOVERNOR FOR GRAIN CLEANERS.

No. 264,023. Patented Sept. 5, 1882.

Fig. 1.



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Julius Ochs

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Lewis Godfrey

5 Sheets—Sheet 2.

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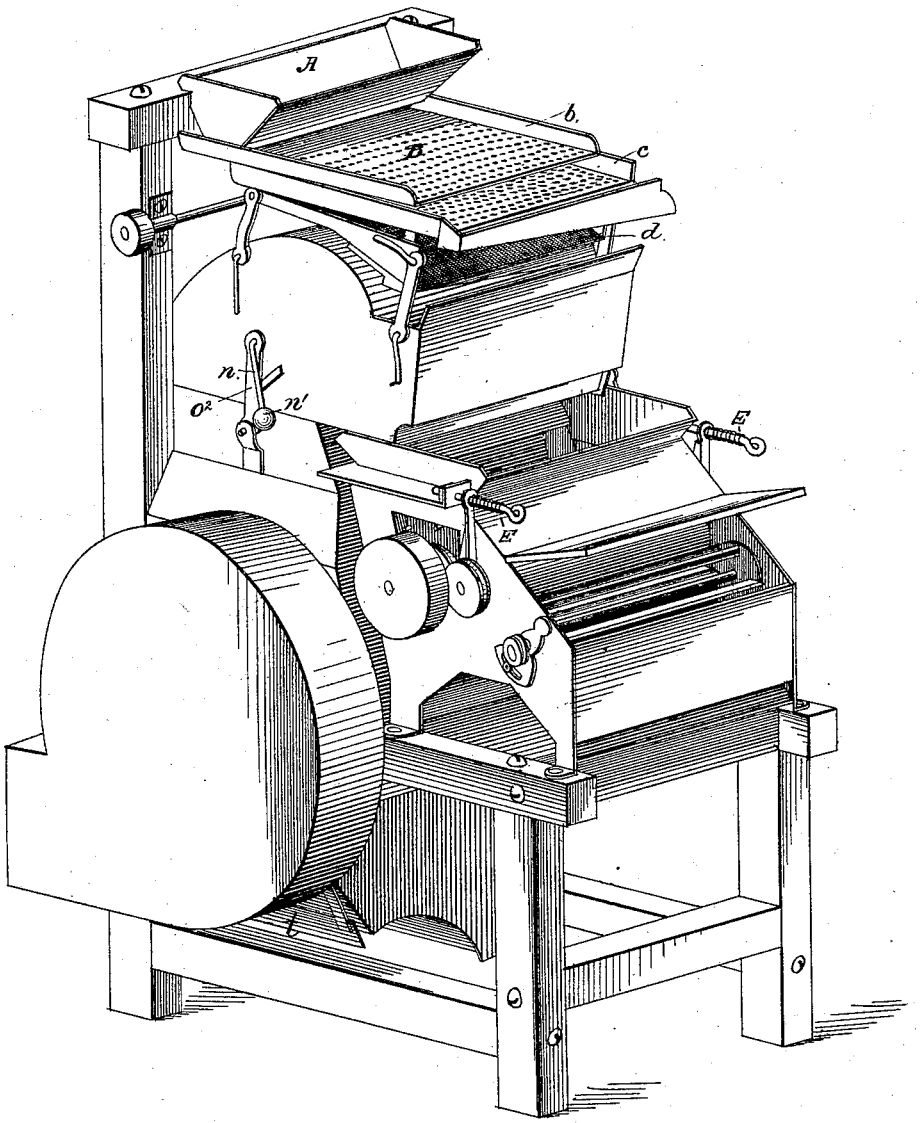
Fig. 2.



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5 Sheets—Sheet 3.

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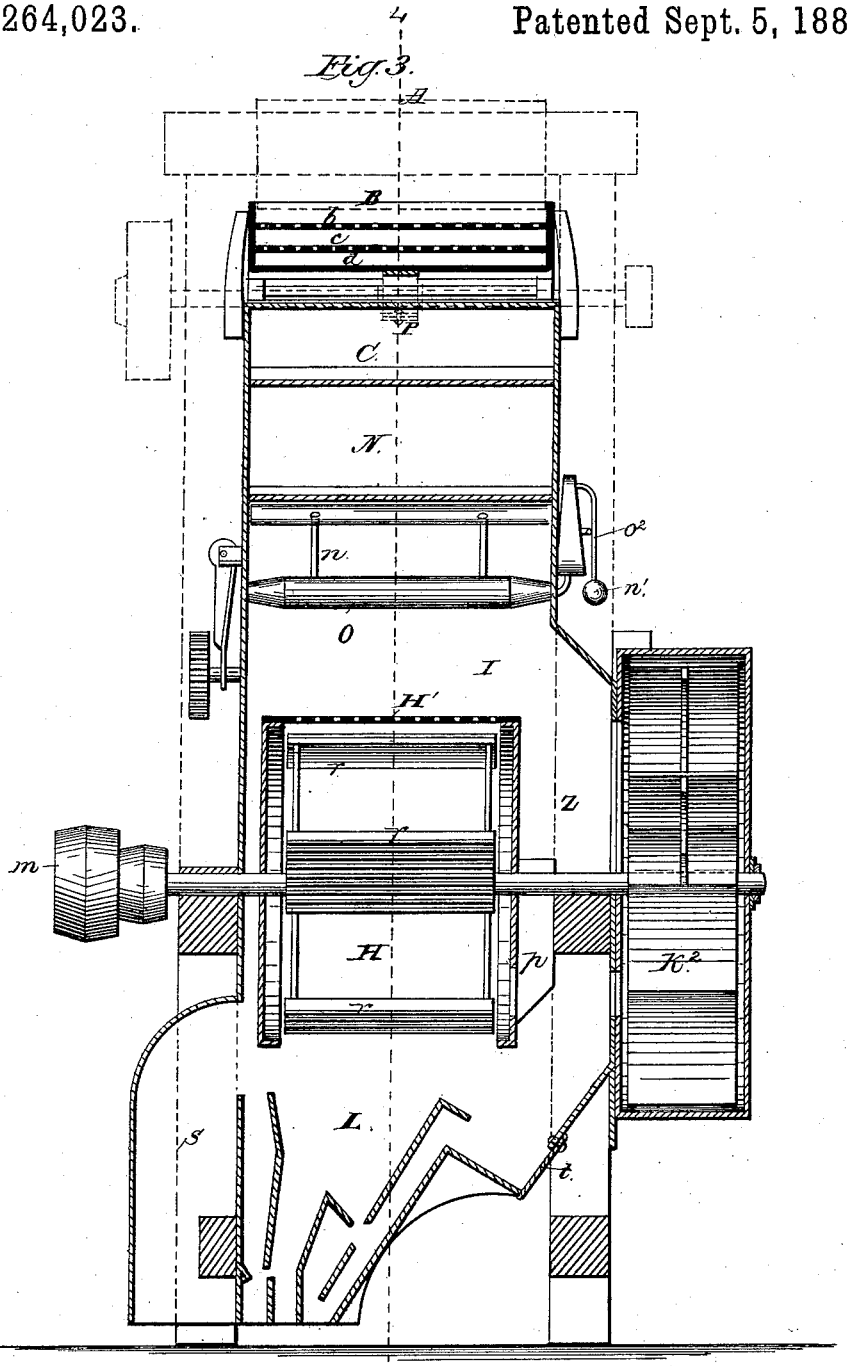
Fig. 3.



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Lewis Godfrey.

5 Sheets—Sheet 4.

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BLAST GOVERNOR FOR GRAIN CLEANERS.

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Fig. 4.

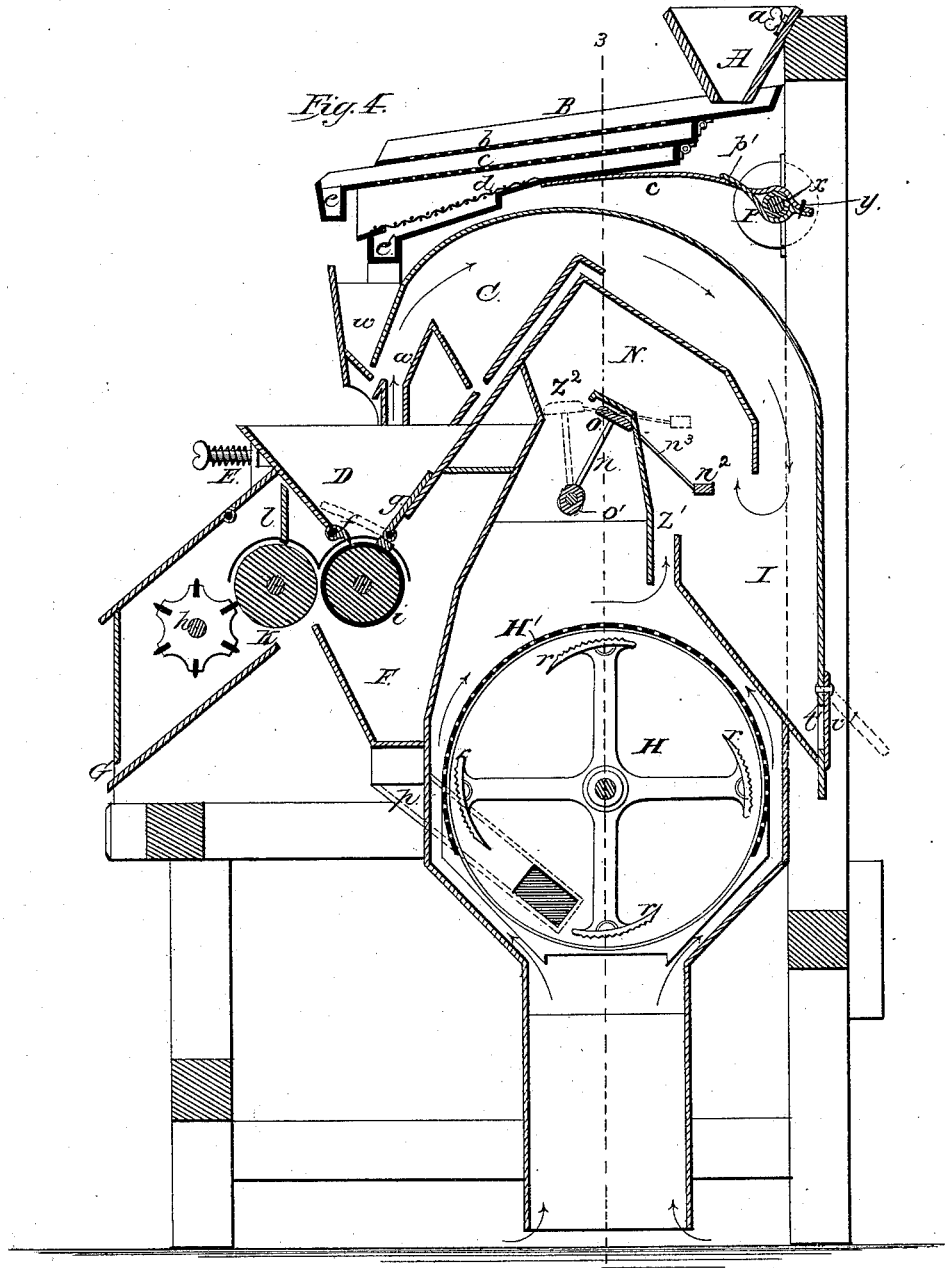

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Fig. 6.

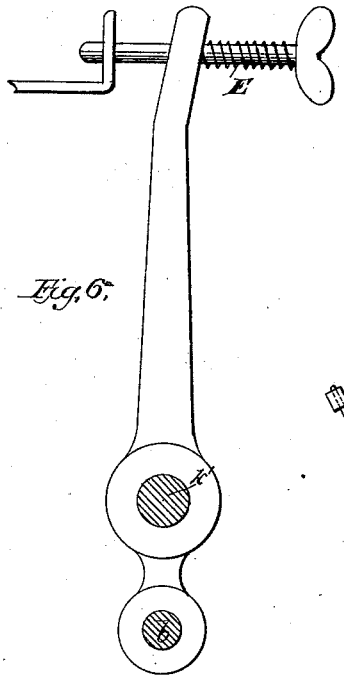


Fig. 8.

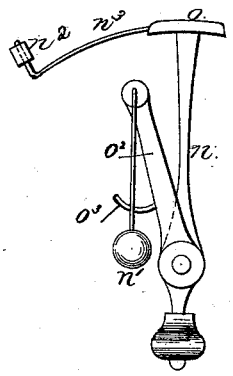


Fig. 7.

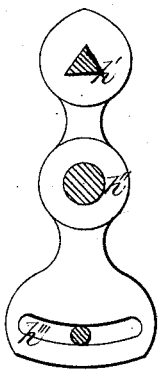
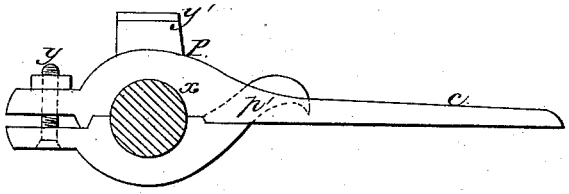


Fig. 5.



Witnesses:
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Julius Dekker

Inventors:
Samuel W. Andrews.
Lewis Godfrey

UNITED STATES PATENT OFFICE.

SAMUEL W. ANDREWS AND LEWIS GODFREY, OF KNOXVILLE, TENNESSEE, ASSIGNORS, BY MESNE ASSIGNMENTS, OF ONE-HALF TO SARAH A. VANDERHOOF; SAID GODFREY, IN HIS OWN RIGHT AND AS ADMINISTRATOR OF SAID ANDREWS, DECEASED, ASSIGNOR TO O. G. VANDERHOOF, OF SAME PLACE.

BLAST-GOVERNOR FOR GRAIN-CLEANERS.

SPECIFICATION forming part of Letters Patent No. 264,023, dated September 5, 1882.

Application filed August 8, 1878.

To all whom it may concern:

Be it known that we, SAMUEL W. ANDREWS and LEWIS GODFREY, both of Knoxville, county of Knox, and State of Tennessee, formerly of Greeneville, Greene county, State of Tennessee, have invented certain Improvements in Blast-Governors for Grain-Cleaners, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

Our invention consists in improvements in blast-governors for grain-cleaners, the cleaner to which they are applied being preferably of the construction hereinafter described.

In the drawings, Figure 1 is a front perspective view of the grain-cleaner to which our governor is preferably applied, and Fig. 2 a rear perspective view of the same. Fig. 3 is a section through the line 3 3 of Fig. 4. Fig. 4 is a section through the line 4 4 of Fig. 3. Fig. 5 is a view of the clasp over the eccentric used in vibrating the shoe. Fig. 6 represents the adjusting-screw and hanger attached to the journal of the rubber roll, which is used to regulate the pressure between the rolls. Fig. 7 is a separate view of the hanger to the journal of the brush-cylinder, used to adjust the brush as it wears away. Fig. 8 represents the automatic valve used in regulating the blast in the separating-chambers.

The grain is fed into the hopper A of a screening-shoe, B. This hopper is so constructed that it can be raised or lowered by a set-screw, *a*, in said hopper, by which means the admission into the shoe of the grain is regulated. The shoe B is composed of three parts or screens, *b c d*, and so hinged that two of these parts can be raised separately to clean out anything clogging the screens. The perforations of the first screen are larger than those of the second, and the third is made out of fine woven-wire cloth having meshes only large enough to allow small particles to pass through, such as sand and dust. *e* and *e'* represent spouts for discharging the refuse from the shoe. This shoe is vibrated by an eccentric-shaft, P. The grain, with such other matter as passes through the screens *b* and *c*, is discharged into the suction-separator C. Here the grain is separated by deflectors *w w*, and is discharged through a strong draft into the hopper D of the cockle-separator. The draft, as shown by arrows, Fig. 4, carries up all light impurities, depositing them into a screening-chamber, I, and carrying the dust into the eye Z of the fan. The arrangement of the opening in the draft-separator insures the contact of every particle with the draft and the saving of good grains which may be drawn into the separator. The draft, after passing through the first orifices, diminishes in strength in proportion to the amount of draft let in by an automatic valve, to be hereinafter described. In consequence of this enlargement the solid grains drop through the supplemental pair of discharge-orifices into the hopper of the cockle-separator, while the lighter particles are carried over with the screenings into the chamber I.

The hopper D of the cockle-extractor is provided at the bottom with a pivoted cut-off or valve, *g*, Fig. 4, operated by means of a shiftable arm, *g'*, on the outside of hopper. The normal position of this cut-off is represented by full lines. The grain is conducted onto the hard roll *i* of the separator by a valve, *f*, Fig. 4, having a handle, *f'*, Fig. 1, on the outside of hopper, which regulates the entrance of the grain and distributes it along the hard roll *i*.

The other parts of the separator are a rubber roll, K, and an equalizing spring set-screw, E, applied to the journal thereof, a brush-cylinder, *h*, and an adjusting-head attached to the journal thereof to regulate the brush as it wears away.

A hopper or funnel-shaped spout, F, immediately under the hard roll receives the grain as it leaves the rolls. Another spout, *p*, then conducts the grain into the scouring-cylinder H' H, Fig. 4, on the fan side. This hopper or funnel may receive the grain direct from the hopper of the cockle-separator, if it is not necessary to pass the grain through the rolls of the cockle-separator, and to effect this change the valve *g* is shifted to the position denoted by dotted lines in Fig. 4.

l is a partition placed above the rubber roll

K to prevent the grain from passing over it. The grain, in passing from the hard roll, is prevented from running over the top of the rubber roll by the partition *l*, which backs the grain and cockle up and obliges it all to pass between the rolls *i* and K, where by pressure caused by spring set-screw E the cockle, owing to its rough surface, is made to adhere to the rubber, and is carried around until it comes in contact with a rapidly-revolving brush-cylinder, *h*, by which it is swept off and discharged at G.

The scourer H consists of a horizontal revolving spider carrying a sufficient number of scouring-plates, *r*, on its arms, in combination with a scouring-case, H′, which may be of punched sheet metal or heavy wire-cloth or other suitable material.

The plates *r* are constructed with longitudinal rasping-ridges with sharp shoulders *r′* in front and set on curved arms eccentrically to the case. This eccentricity causes the rear edges of these scouring-plates *r* to approach the surface of the shell more closely for the purpose of rubbing and keeping the grain in constant motion without a fracture of the kernel. This arrangement also causes the plates to act as fan-blades, and to expel dust and assist in discharging the grain from the shell. The grain, as it leaves the case, is discharged on the pulley side through a spout, S, Fig. 3, into another blast-chamber, L, similar to the first separator. This is placed directly under the shell, as shown, and is attached to the outside casing. The air is drawn up through the different orifices, as shown by arrows, circulating through and about the case. The draft, as it passes through this separator to the aperture Z′, strikes the piston n^2 of the lower automatic valve, *o*, which closes it over the aperture Z^2, thus shutting off the draft. This can be adjusted to such draft as may be desired by moving the ball outward on the valve-arm. The speed, after the ball is set, will regulate the separation without further attention, unless a change is desired in the class of separation. If desired, openings *t*, Fig. 3, can be made in the shell, thus cutting off the direct blast around the shell from the lower separator. All light and imperfect grains that may have passed into and through the scouring-case are carried over by the draft of the separator and deposited at the door *v′*. The action of the air causes this trap-door to close. The weight of the grain deposited will open it and discharge what may have accumulated. The normal position of this door is shown in full lines, and when open by dotted lines. The draft, as it passes through this separator, carries all impurities and light grains over into a second screenings-chamber, Z, and dust, &c., carried to eye Z′ of fan. A stationary valve is used to regulate this blast, and is adjusted by a movable arm on the outside of said separator. Thees a draft for the purposbove stated, and for final discharge of dust and other light refuse from the machine, is produced by a rotary suction-fan, K^2, Fig. 3, and which may be of any approved construction.

The main third trunk, N, is of arc shape, and extends from the first separator, C, in front to the screenings-chamber in the rear. The light impurities are carried up in direction of the arrows through this trunk against a deflecting-shelf in the screenings-chamber, where the blast is expanded and reversed, which causes the heavier particles to be deposited at the trap-door *v′*, the weight of which causes the lid to open and discharge the particles, while the dust and lighter stuff are carried over into the eye of the fan and discharged out of the mill. This fan is closed on the outside, excepting where it discharges the dust into a discharge, K′.

To provide for controlling and equalizing the draft, an automatic governor, *n*, is formed in the wind-chamber. It consists of a valve, *o*, and a piston, n^2, extending the full width of the chamber. The valve *o* is made of sufficient width to close the opening Z^2. This is connected by arms to a shaft hung some distance below. The piston is also attached to the valve by wires n^3, and extends into the screenings-chamber I. The draft, as it ascends through the chamber, presses this piston up, causing the valve to close over the apperture Z^2, and in order to control this automatic valve or governor an arm with a movable ball, *n′*, is placed on the end of the shaft on the outside of the machine. This ball is pivoted to the upper end of the arm o^2, and is held stationary by a circular piece, o^3, extending from the arm. Moving the ball outward increases the draft, and when the ball is in its normal position and motion is given to the machine the piston is pressed up and the arm stands perpendicular. This causes the valve to close over the aperture Z^2. Pressing the ball outward or to the right opens the valve to such a gage as may be desired.

These devices are designed to regulate the blast under variable motion when the machine is without the attention of the operator. Before placing the adjusting-ball the whole should be well balanced.

This device can be arranged in any other form desired, providing always that the air of the draft shall press either upward or downward on the piston in such a way as to close the aperture.

The hanger used in adjusting the pressure of the rubber roll, as seen in Fig. 6, works on a pivot, *b*, and the journal at *k′*. The upper part is slotted, so that the screw which is screwed into the frame of the separator can adjust itself by the pressure of the spiral spring.

The hanger, as seen in Fig. 7, is used to adjust the brush-cylinder as it wears away. It works on a pivot, *h′*, and is held stationary at *h‴* by a nut, and is attached to the journal at *h″*.

We have here described the preferred form of grain-cleaner, including a scourer and cockle-separator, to which our improvement is applied; but it is obvious that these parts of the device

may be varied, our blast-governor being applicable to various descriptions of cleaners.

It is evident that the automatic blast-governor constructed as above described can be employed in all classes of machines in which a suction-draft is employed for separating or grading materials according to gravity; and, in fact, we propose applying our automatic governor to all machines where a suction-draft is employed for any purpose whatever.

What we claim as new, and desire to secure by Letters Patent, is—

In a forced-draft grain-cleaner, the combination, with the screening and wind chambers and their accessories, of the automatic blast-regulator at the exit of the screening-chamber, consisting of valve *o*, piston n^2, attached to the valve by wires n^3, and extending into the screening-chamber, and an adjustable balance, n', pivoted to the upper end of arm o^2 and held by the circular piece o^3, substantially as set forth.

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LEWIS GODFREY.

Teste:
SAML. C. LANCASTER,
JULIUS OCHS.