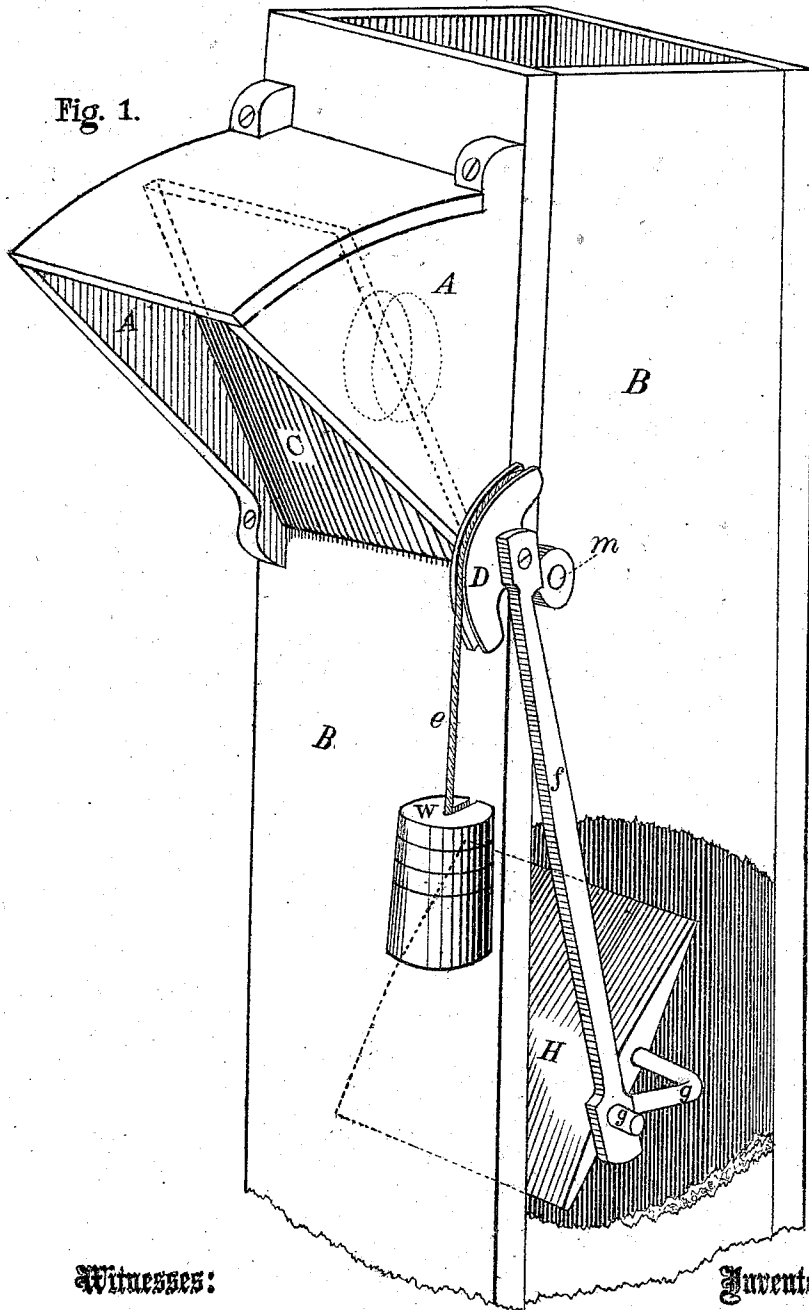


T. H O G E .

Blast-Governors for Grain-Separators.

No. 138,563.

Patented May 6, 1873.



Witnesses:

James W. Phillips
J. Jackson Purman

Inventor:

Thomas Hoge.

T. HOGE.

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Fig. 2.

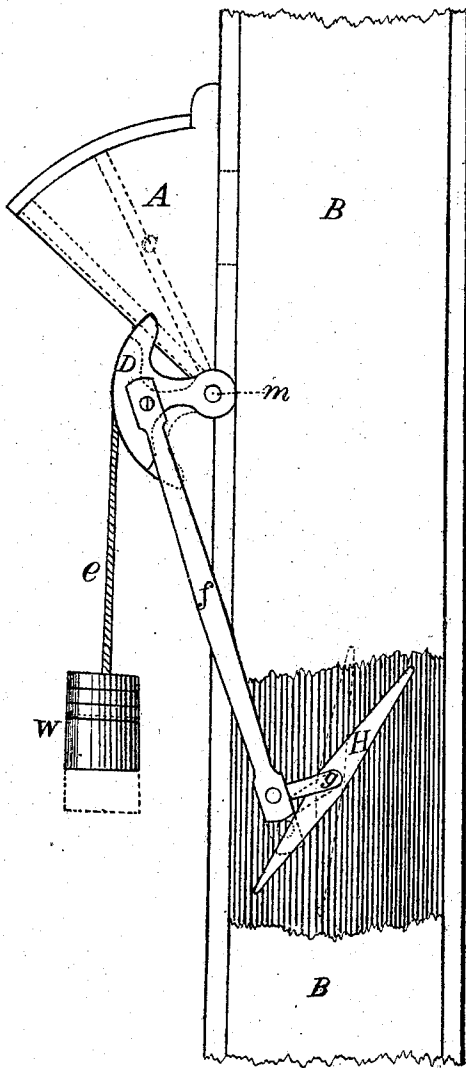
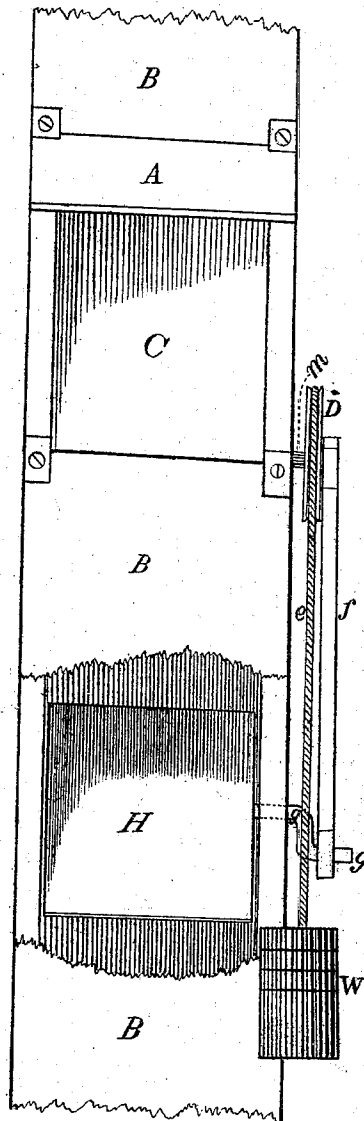


Fig. 3.



Witnesses:

James W. Phillips
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Inventor:

Thomas Hoge.

UNITED STATES PATENT OFFICE.

THOMAS HOGE, OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVEMENT IN BLAST-GOVERNORS FOR GRAIN-SEPARATORS.

Specification forming part of Letters Patent No. **138,563**, dated May 6, 1873; application filed March 3, 1873.

To all whom it may concern:

Be it known that I, THOMAS HOGE, of Washington, District of Columbia, have invented an Automatic Blast-Governor, of which the following is a specification:

My invention consists in making, automatically, a regular and constant current of air through the pipes or trunks of smut and separating or other machines, using air-currents, whether produced by suction, or blowing of fans, or otherwise, and of maintaining such regularity constantly while the speed of the driving power may be irregular and varying.

In order for a current of air to be strong enough to lift and carry off one kind of grain and not another kind somewhat heavier—as, for instance, to separate chess from wheat it requires a certain amount of force, which is equivalent to the moving of the air a certain definite number of feet per second, which is also equivalent to a definite and constant number of ounces pressure per square foot on the surface of the trunk through which it passes. Thus, if an upward current of air, moving at the rate of ten feet per second, produce a pressure of ten ounces per square foot on the inside of the trunk conveying it, and be sufficient to lift grains of chess in one instance, then it is evident that this speed of air will, under like circumstances, always produce like pressure and lift similar grains. Conversely, if we maintain a uniform pressure on the inside of the trunk by an air-current, we get a constant speed of air and the same kind of work done by it constantly.

My invention consists in the discovery and practical application of these principles. If we use a piston fitted loosely into a cylinder which is connected at one end with the air-current, then the piston will be acted upon by the pressure, external or internal, as the case may be; and if sufficient force, in the form of weights or springs, be applied to the piston, so as to act in a direction opposite to the air-pressure, and just sufficient to balance the pressure produced by a current of ten feet per second, the piston will remain suspended in whatever position it may occupy in the cylinder, as the area of the piston and weight remains the same in whatever position they occupy; but if the current be increased slightly

the piston will be drawn toward one end of the cylinder; if decreased, it will move toward the other end. Now, if we connect this piston, by suitable rods and levers, to the arm of a butterfly or other balanced valve in the trunk, the motions of the piston will be communicated to the valve, and when properly adjusted the speed or pressure of the air-current becomes self-regulating and the current maintained uniform. If the current be produced by suction instead of compression, then the pressure will be external instead of internal, and the piston acted upon in the opposite direction from the last case, and the balancing weight must also be arranged to act in the opposite direction.

Any other arrangement acting upon the same principle may also be used instead of the piston and cylinder—as, for instance, a bellows, or the contrivance shown in the accompanying drawing and forming part of this specification, in which—

Figure 1, Plate 1, shows a perspective view of a portion of an air-trunk, B, used in grain-separators, with my invention attached. Fig. 2, Plate 2, is a side elevation, and Fig. 3 a front elevation, of the same thing, with portions of the trunk B broken away in each to show the butterfly-valve H within.

Similar letters refer to similar parts in each figure.

C represents a kind of valve like one-half of a butterfly-valve, or a gate swinging on a pivot or shaft, *m*, as a hinge, and fitting loosely in the box A, at any angle, through which it turns. There is an opening from the back part of the box A, through into the air-trunk B, through which the air may be partly exhausted by suction from behind the valve C, which will draw C backward toward the trunk B, thus elevating the arm D on the shaft *m*, thus raising the bar *f* and the arm or crank *g* of the butterfly-valve H, which will partially shut off the air-current at H and diminish the air-pressure on the valve C until it will stop moving; or, if diminished too much, then the force of the weight W, connected by the cord *e* to the lever D, will pull the valve C back again, thus opening the valve H by their connections, as before stated. Thus, if the speed of the fan or other machine producing the air-

current increases above the required amount the valve C is drawn in more or less in proportion to the increase, which in turn acts upon the valve H, causing it to close sufficiently to just maintain a current in B sufficient to balance the weight W. By adding a little more weight to the weight W it will pull a little harder on C and open the valve H a little more, thus producing an air-current of a little more force, which then remains at this increased force until again changed by adding to or taking from the weight W. The weight W, being suspended from a curve whose center is in *m*, will exert an equal force on C in whatever position it occupies, as its leverage is always the same, and the area of C being always the same it will always require a uniform force of air in the trunk above H to balance W in whatever position it assumes, no difference how much it varies below H so long as there is air enough when all turned on to balance W.

The cord *e* and weight W may be conveyed from the machine in one part of the building

to any other part where most convenient for adjusting the weight to suit different kinds of grain, or other work, without going to the machine itself.

If the air-current be produced by blast instead of suction the pressure will be outward on C instead of inward, and it only becomes necessary to turn the arm D around one hundred and eighty degrees on the shaft *m*, with the cord *e* and rod *f* attached, when the weight will again counterbalance the force on C and regulate H, as before.

I claim—

A blast-regulating valve, automatically adjusted by means of another valve or piston suitably connected to it, the latter being actuated by the difference in pressure of the blast and the external air, substantially as and for the purpose described.

THOMAS HOGE.

Witnesses:

JAMES W. PHILLIPS,
J. JACKSON PURMAN.