(No Model.) 2 Sheets—Sheet 1.

R. W. KIRKPATRICK.

AIR BLAST REGULATOR FOR FANNING MILLS, &c.

No. 344,912. Patented July 6, 1886.

Fig. 1.

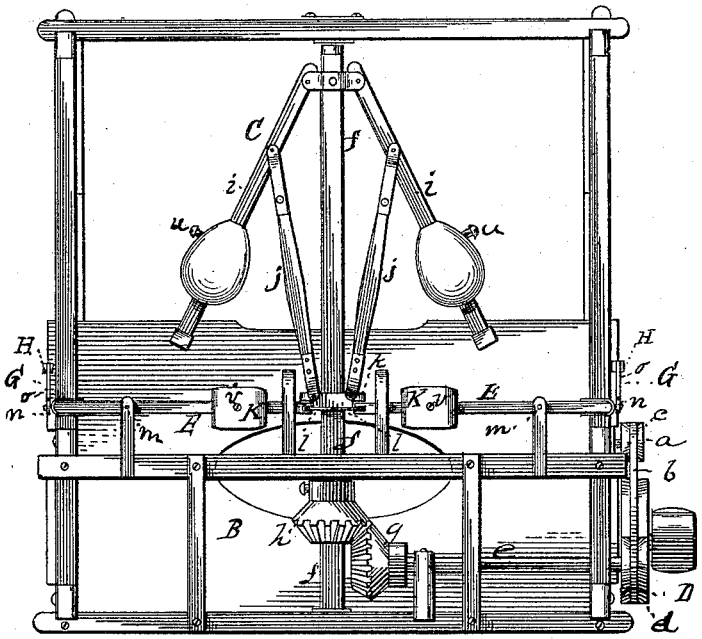
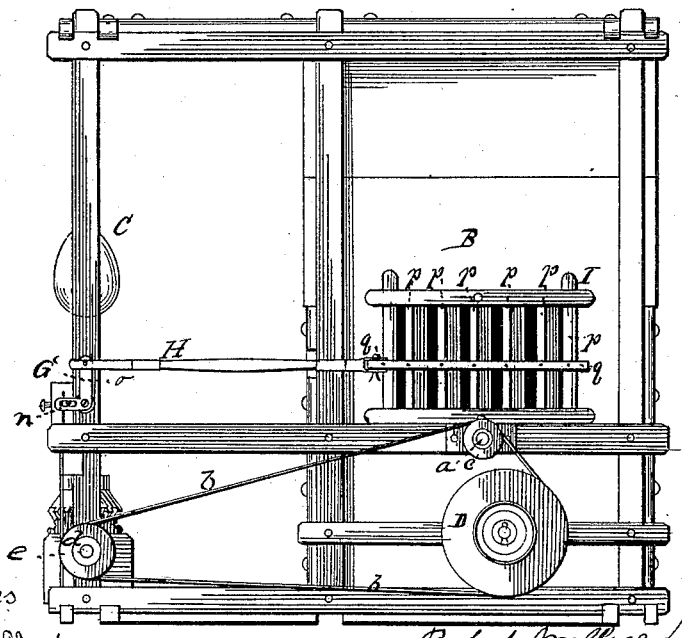


Fig. 2.



Witnesses
Norris A. Clark
Chas. P. Bailey.

Inventor
Robert Wallace Kirkpatrick.
By his Attorney, Louis Fesser & Co.

(No Model.) 2 Sheets—Sheet 2.

R. W. KIRKPATRICK.

AIR BLAST REGULATOR FOR FANNING MILLS, &c.

No. 344,912. Patented July 6, 1886.

Fig. 3.

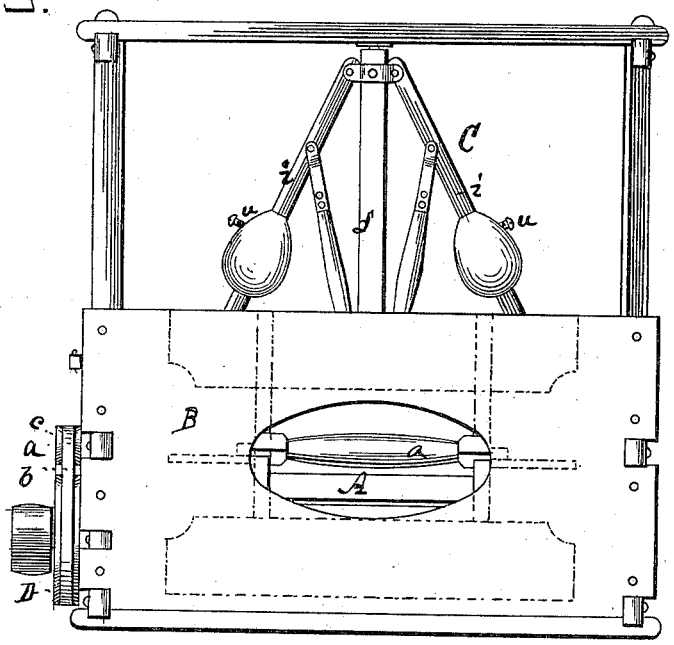
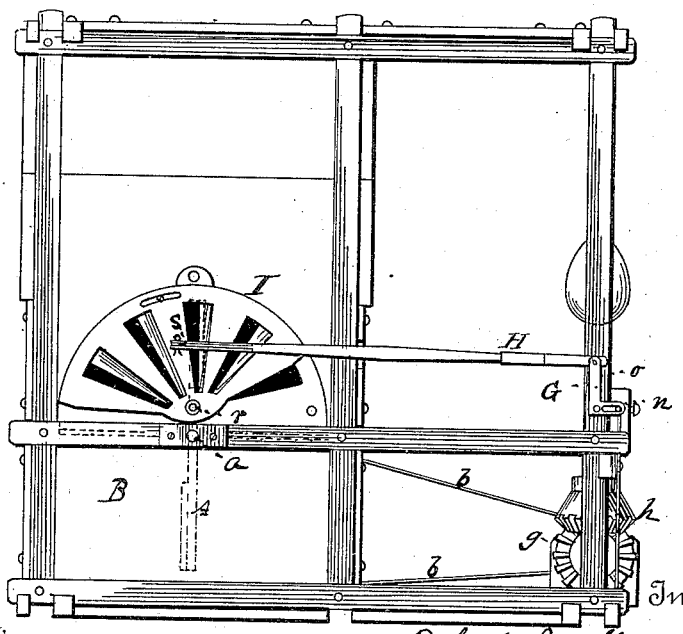


Fig. 4.



Witnesses
Norris A. Clark.
Chas. P. Bailey

Inventor,
Robert Wallace Kirkpatrick,
By his Attorney, Louis Fesser & Co.

UNITED STATES PATENT OFFICE.

ROBERT WALLACE KIRKPATRICK, OF GLENVILLE, MINNESOTA.

AIR-BLAST REGULATOR FOR FANNING-MILLS, &c.

SPECIFICATION forming part of Letters Patent No. 344,912, dated July 6, 1886.

Application filed March 8, 1886. Serial No. 194,446. (No model.)

To all whom it may concern:

Be it known that I, ROBERT WALLACE KIRKPATRICK, a citizen of the United States, residing at Glenville, in the county of Freeborn and State of Minnesota, have invented an Improvement in Air-Blast Regulators for Fanning-Mills, &c.; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

Figure 1 of the drawings represents a front view of so much of the case or frame of a fanning-mill as is necessary to show my invention applied thereto; Fig. 2, a side view of the same; Fig. 3, a rear view thereof, and Fig. 4 a view of the other side of the same.

Like letters designate corresponding parts in all of the figures.

It being desirable to have a uniform supply or force of wind or blast in a fanning-mill, when the grain or seed is of uniform quality, and adapted in strength thereto, whatever may be the variable speed of the fanning-mill or grain-separator, and also necessary that the force of the blast be changed according to the kind of grain or seed to be winnowed or cleaned, and according to the quality or weight of the same, my invention consists in the mechanism hereinafter described and claimed, whereby these desired purposes are effected, the one automatically and the other by predetermined adjustment.

In the accompanying drawings the revolving fan A is represented inside of its case or wind-chest B, from which the blast is conducted to any position required to perform its work, this part of the fanning-mill or grain-separator forming no part of my invention and requiring no representation or description in this connection.

I regulate the admission of air into the fan-case, near its shaft *a*, by enlarging or diminishing the apertures for the influx of the air, since it is obvious that the more air that is admitted the stronger will be blast, so long as the admission of the air is within the capacity and force of the fan-wheel.

For producing uniformity of air admission with variable speed of the fan-wheel, I employ, in connection with the shutters, a speed-governor, C, of any suitable construction, an ordinary ball-governor being shown in the drawings. As shown, the governor is rotated by the same belt, *b*, which transmits revolving motion from the driving-pulley D to the fan-wheel shaft *a*, by passing around its pulley *c*, and thence to a pulley, *d*, on a transmitting-shaft, *e*, which gears with the governor-shaft *f* by the bevel gear-wheels *g* and *h*, at the lower end of the said governor-shaft.

The governor-arms *i i* are connected by rods *j j* with a sliding block or collar, *k*, on the governor-shaft below its arms. On this sliding collar is a circular flange, *l*, that is embraced by the inner forked ends of two levers, E E, which I term "scale-beams," and which, being pivoted at *m m* to the frame or case of the machine, are vibrated by the rise and fall of the governor-balls. The outer ends of these lever scale-beams are respectively pivoted or otherwise connected with the horizontal arms *n n* of two bell-crank levers, G G, and the vertical or upright arms *o o* of the bell-crank levers are pivoted or otherwise joined to connecting-rods H H, which extend to and are connected with the respective shutters I I, which control the size of the apertures near the fan-wheel shaft *a* at its two ends. In general, I may use any suitable kind of shutters and any convenient form of air-admitting apertures. I have shown two forms of apertures and two kinds of shutters in the drawings, not only to illustrate different ways of carrying out my invention, but to show how one construction may be better adapted to one kind of grain or seeds and another kind of shutter to another kind of grain or seeds. Thus, on one side of the case, as shown in Fig. 2, I have shown a shutter made of a set of pivoted slats, *p p*, all connected with a cross-bar, *q*, which is pivoted to or otherwise connected with the connecting-rod H on that side of the machine. When the slats *p p* are folded together they close the aperture, and when they are separated they open the aperture more or less. The arrangement is such that, as the governor-arms rise and the inner ends of the lever scale-beams E E are consequently raised, and the outer ends of the said lever scale-beams are depressed, thereby depressing the horizontal arms of the bell-crank levers G G and drawing forward the connecting-rods H H, the said slats *p p* are partly closed, thereby diminishing the aperture as the speed of the machine

and of the fan-wheel increases, and increasing the aperture as the speed diminishes. Since these slats, after they are partly opened, vary the width of the apertures between one another only slightly with a considerable movement of the governor-arms, this gradual movement is best adapted to fanning-mills for heavy or coarse grains—such as wheat, rye, and barley; but for fine seeds—such as timothy, clover, and flax-seed--a more even and quickly-responding shutter is requisite or desirable. For this use the construction shown in Fig. 4 is better adapted. Here a semicircular shutter, I, (it may be circular,) is pivoted at *r* to the case and connected at *s* with the connecting-rod H, and is provided with register-openings alternating with closed portions, operating in connection with alternate register-openings and closed portions of similar form in the side of the fan-case. The arrangement is such that as the connecting-rod H is drawn forward by the rise of the governor-balls, occasioned by increased speed, the register-plates of the shutter close, more or less, the register-openings in the side of the fan-case, and when the speed diminishes and the governor-balls fall, the consequent backward motion of the connecting-rod H opens more or less the apertures in the side of the fan-case. It is of course to be understood that in the actual construction ordinarily the same kind of shutter will be used on both sides of the case.

The governor-balls are adjustable up and down on the arms of the governor, and secured in any position by set-screws *u u*, or other suitable means, to regulate the power of the governor to the work required of it, so that it will answer promptly to the variation in speed, and yet not operate with unnecessary force or consume power unnecessarily.

The levers E E are here designated scale-beams, because they are provided with movable weights or poises K K, movable along to different positions on the levers by set-screws *u u* or their equivalent, whereby the power of the governor to regulate the supply of air to the fan-wheel is regulated. By moving the weights inward the power of the governor, having more weight to lift, is diminished, and vice versa; hence by this adjustment the effect on the blast may be varied as required. These weights may be adjusted definitely by a marked scale on each beam. With the two adjustments of the governor-balls and the weights on the scale-beams any range of adjustment can be effected.

The adjustment of the governor-balls will serve in changing from one kind of grain or seeds to another, and the adjustment of the weights on the scale-beams will serve to adjust the power of the governor to the quality of grain or seeds while the fanning-mill is in motion.

I claim as my invention—

1. The combination of the case or wind-chest, the fan wheel therein, shutters controlling the admission of air to the fan-wheel, a speed-governor having adjustable balls thereon, levers vibrated by the governor, adjustable weights upon the said levers, and means, as crank-levers vibrated by the weighted levers and connecting-rod between the crank-levers and shutters, for imparting the motions of the governor-levers to the shutters, substantially as and for the purpose herein specified.

2. The combination of the fan A, wind-chest B, governor C, having a flanged sliding collar, *k*, on its shaft, forked levers E E, coupled at one end to the said collar, movable weights K K on the said levers, crank-levers G G, connecting-rods H H, and shutters I I, substantially as and for the purpose herein specified.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ROBERT WALLACE KIRKPATRICK.

Witnesses:
LOUIS FEESER, Jr.,
W. J. RODGERS.