(No Model.)

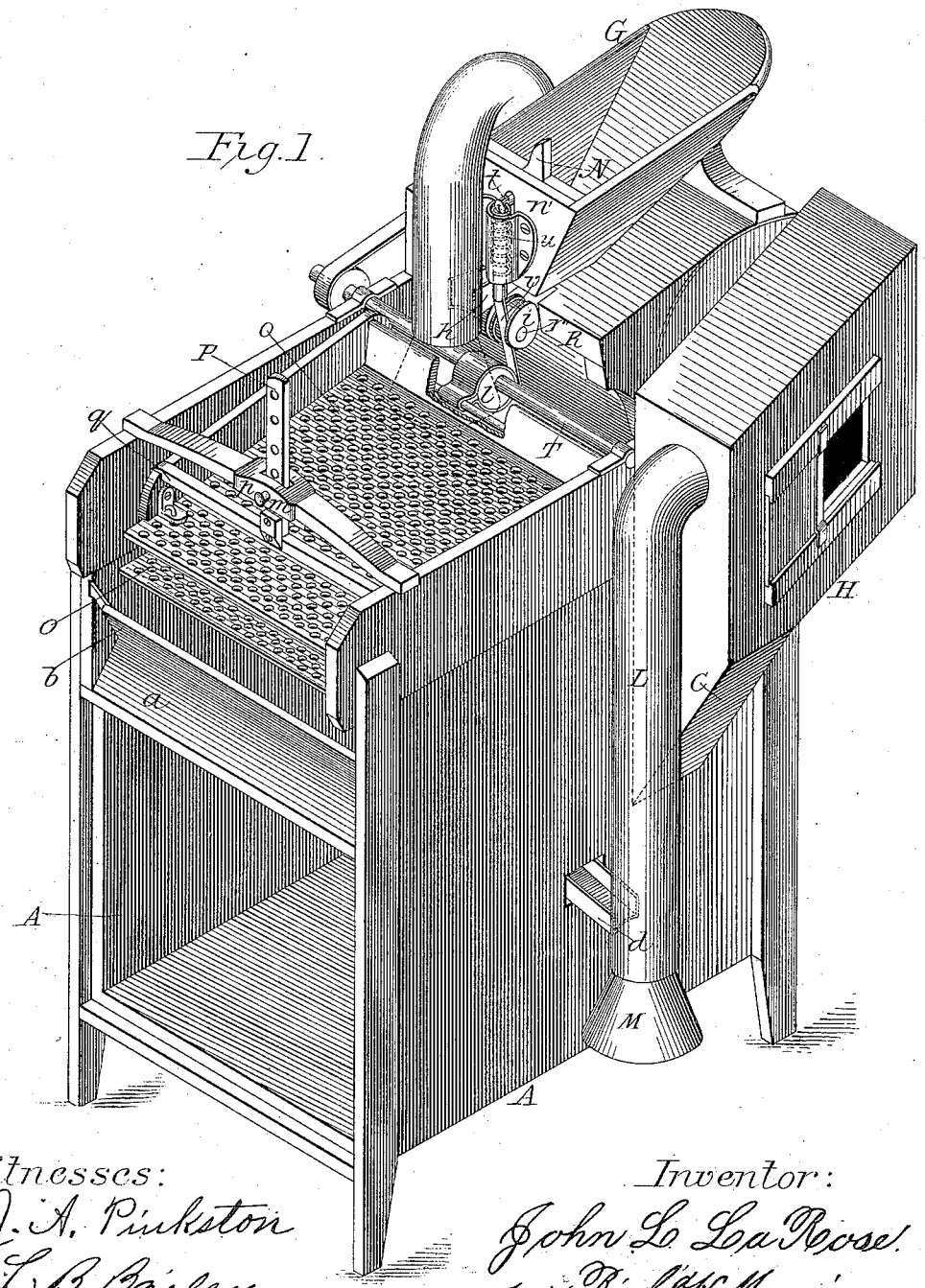
3 Sheets—Sheet 1.

J. L. LA ROSE.

GRAIN SEPARATOR.

No. 302,570. Patented July 29, 1884.

Fig. 1.



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(No Model.) 3 Sheets—Sheet 2.

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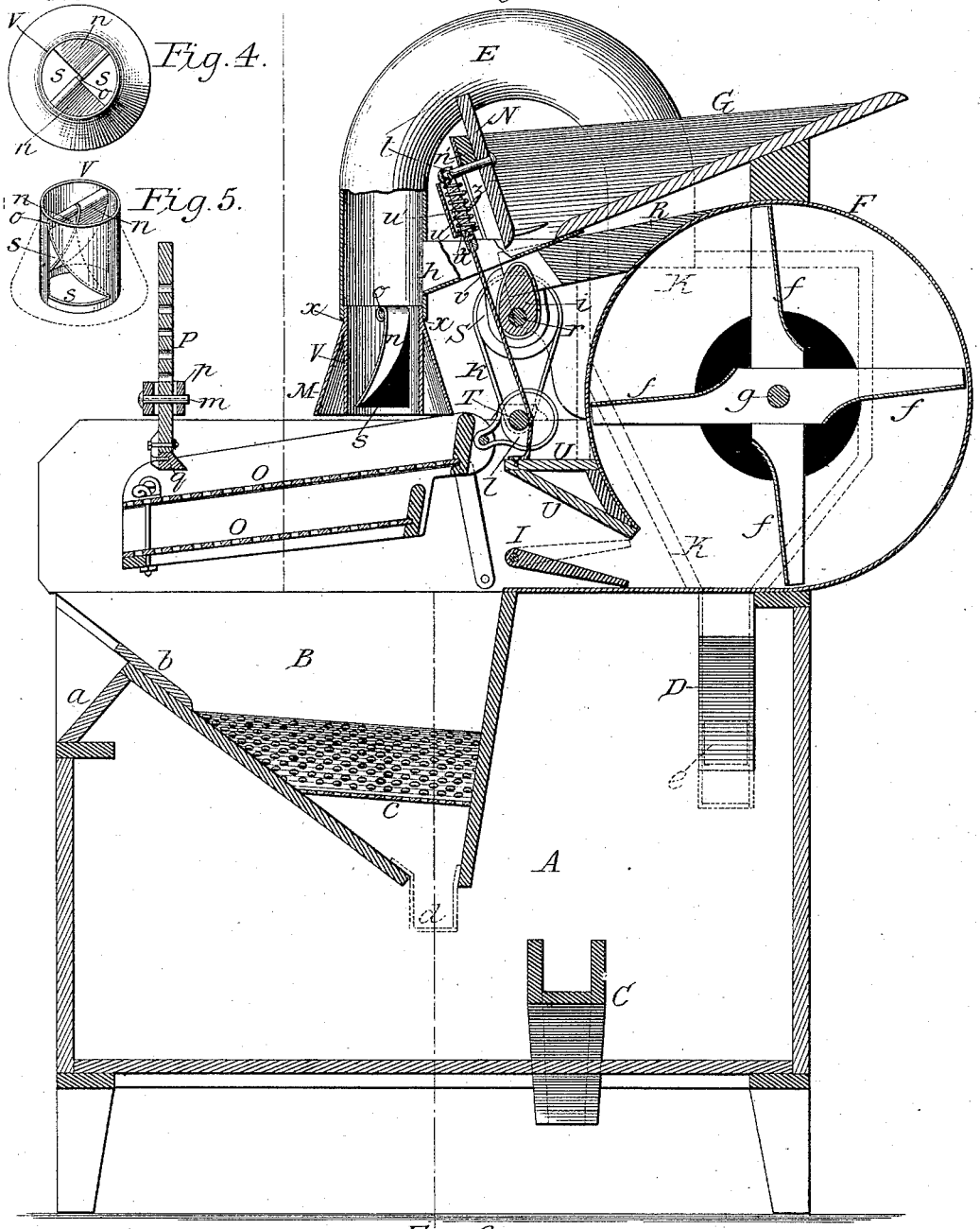
GRAIN SEPARATOR.

No. 302,570. Patented July 29, 1884.

Fig. 2.



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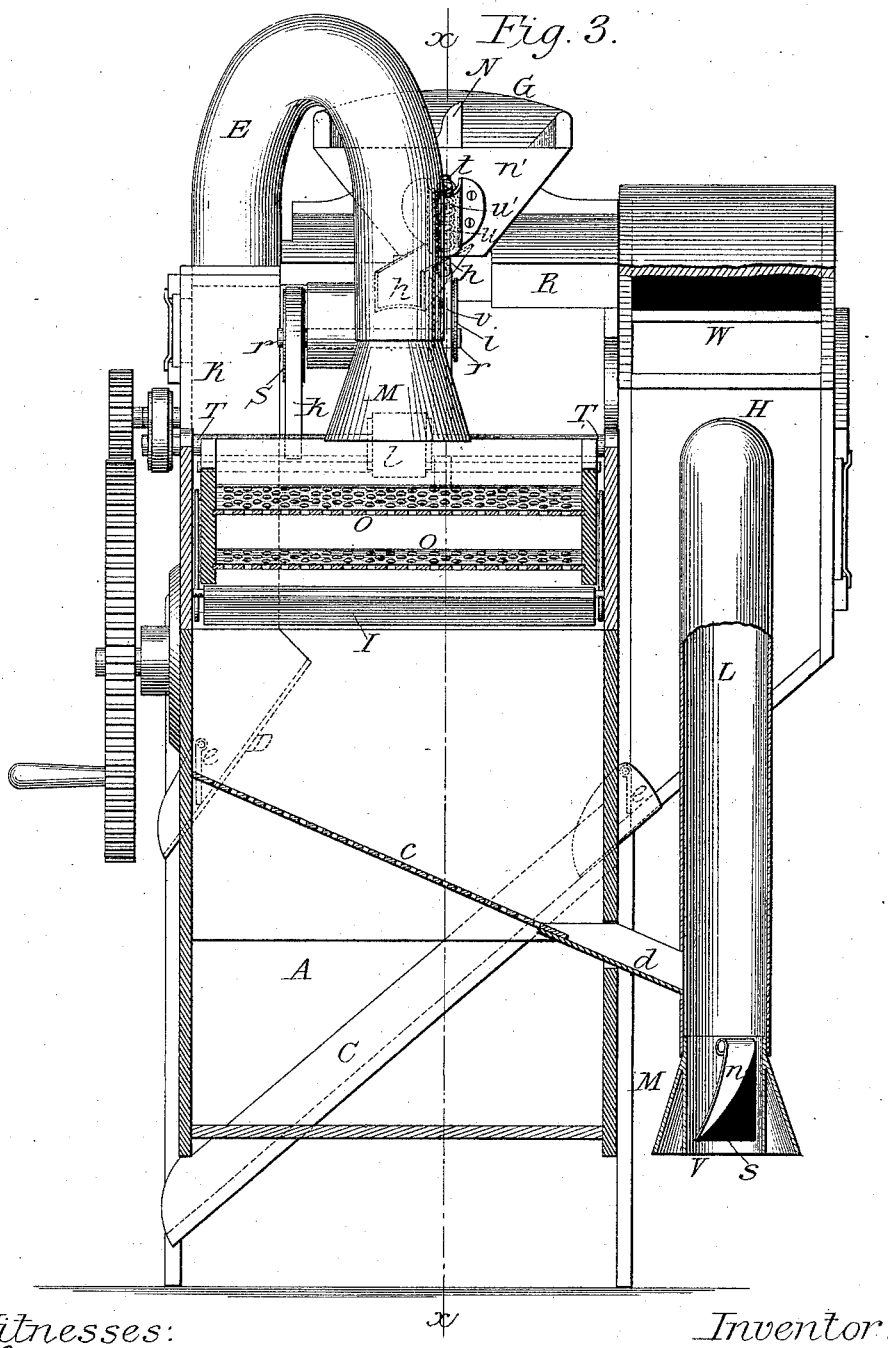
3 Sheets—Sheet 3.

J. L. LA ROSE.

GRAIN SEPARATOR.

No. 302,570. Patented July 29, 1884.

Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN L. LA ROSE, OF KANSAS CITY, MISSOURI.

GRAIN-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 302,570, dated July 29, 1884.

Application filed May 14, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN L. LA ROSE, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Grain-Separators; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

My invention has for its object the construction of a grain-separator in which the separation of the grain from the chaff, &c., may be effected with increased efficiency, while the flow of the grain shall be controlled in its passage to the air-currents by and through the machine; and it consists in the novel construction and combinations of its several parts, which will first be fully described, and then specifically pointed out in the claims.

In the drawings, Figure 1 is a view in perspective of the grain-separator. Fig. 2 is a longitudinal sectional elevation of the separator, taken on the line *x x* of Fig. 3. Fig. 3 is an end elevation, partly in section, of the separator with a portion of the trunk removed, showing the flanges. Fig. 4 is an end view of the suction-trunk looking upward therein. Fig. 5 is a view in perspective of the end of the suction-trunk and the flanges. Fig. 6 is a longitudinal extension of the end of the trunk, showing manner of forming flanges.

A represents the body of the machine, which is constructed interiorly with a hopper, B. This hopper is provided with a valve, *b*, for regulating the supply of air-currents to and beneath the screens O O, and also to the fan-chamber, with the inclines *a*, upon which the foreign substances mixed in the grain are thrown from the screens, and from thence fall to the ground, and with the perforated slide or bottom *c*. *d* is a spout leading from the bottom of the hopper B outwardly and into a vertical suction-trunk, L.

C D are spouts connected with eddy-chambers H and K, respectively, and which are inclined and pass transversely through the machine near each other, and are provided with valves *e e*, which permit the flow of the grain, and close against the currents of air from without.

E represents a curved suction-trunk arranged over the screens and attached to the eddy-chamber K, at one end, and provided with hood M and adjustable section V at the other. *n n* are obliquely-arranged flanges, and *s s* are oblique apertures within the end V of the suction-trunk.

F is the fan-casing. *f f* are the fan-blades, which are placed radially upon the shaft *g*, which passes through the fan-casing F, and rotates upon suitable bearing in the ends of said casing.

G is the upper hopper resting upon fan-casing F and attached to the same, and opening into the curved trunk E by the chute *h*.

H is an eddy-chamber attached to one end of the fan-casing F, and having partition W, which prevents the chaff from entering the fan-chamber and spout C.

I is a transversely-arranged valve in the upper portion of the body of the separator, between the screens and the fan-chamber, which is used to cut off the air-currents from said fan-chamber, admitted by the valve *b*, and concentrate their power upwardly through the screens.

K is an eddy-chamber attached to the end of the fan-casing F in opposite relation to the eddy-chamber H, and which receives the end of suction-trunk E.

L represents the lower suction-trunk attached to eddy-chamber H and receiving spout *d* from the lower hopper, B.

N is a feeding-slide arranged vertically within the hopper G, and fitting against the delivery end *n'* of said hopper.

z is a slot in the delivery end of the hopper opposite the slide N.

t is a pin attached to the slide N and passing outwardly through the slot *z*.

u is a spring within a stationary guide, *u'*, upon the outside of the hopper, said guide having an opening, u^2, at the bottom.

v is a belt attached to pin *t* on slide N at one end, and, passing through the spring *u* and through the opening u^2 in the bottom of guide *u'*, is attached to the frame U of the fan-casing F at the other.

O O are screens, to which is attached the

eccentric *l* and arranged under the suction-trunk E.

P is a vertical adjusting-bar for the screens O O, attached to said screens by the bar *q*, and held by the pin *m* in bar *p* on the upper part of the machine at any desirable point.

R is a tranversely arranged support or bracket on the machine.

S is a pulley on shaft *r*, carrying an eccentric or arm, *i*.

T is a shaft carrying eccentric *l* for reciprocating or agitating the screens O O.

k is a band conveying power from shaft T to the pulley S.

U is the frame-work supporting the fan-casing F at its front end.

In the construction of my invention I make two flanges, *n n*, approximating in form to a laterally-divided segment of an ellipse, the shorter angle of each flange being equal to one-half the diameter interiorly of the suction-trunk E. The two opposite and longest angles of the flanges *n n* are then brought edgewise together, and inserted a suitable distance beyond their respective lengths within the open end of the suction-trunk E. The short angle of each flange being upward, a portion thereof is bent over the rod *o*, which passes diametrically through the trunk. The flanges *n n* are then inclined obliquely and oppositely from their point of attachment and to each other, the curved edges of each flange fitting to the respective curves in the suction-trunk E, and are then secured in place by soldering or any other suitable means.

In the intermediate space not occupied by the flanges *n n* are the apertures *s s* for the passage of the air-currents.

The end V of the suction-trunk E, I have constructed so as to be removed from the said trunk at the point *x x*, below the delivery end of the hopper G, and to accomplish this I provide a cylindrical flange covering the joints at the point of separation between the trunk E and the removable end V, and secure said flange to said trunk E, in which flange the end V of the trunk is made to fit closely.

I may construct the flanges *n n*, as shown in the drawings, from an integral part of the side of the trunk E, first making a vertical and then a transverse incision in said trunk of the required extent, which enables the separated part making the flange to be bent within the trunk, after which it may be secured, as heretofore described.

In the operation of the machine the grain is fed to the upper hopper G in quantity, and its flow within the suction-trunk is regulated by the slide N. The movement of the slide is accelerated by the increased rotation of the eccentric attached to the shaft and operating against the belt, and the orifice through which the grain is fed from the hopper is made relatively larger or smaller by increasing or decreasing the tension of the belt and the consequent compression of the spring within the fixed guide. As the grain is admitted into the suction-trunk E, it is subjected to the action of rotary currents of air, which are impelled upward by the suction created by the fan, the chaff being carried through the curved trunk E, whence it falls into the eddy-chamber K beneath; then into the spout D, connected therewith, and is deposited outside of the machine. The grain then passes to the screens, the heavier substances—such as sticks and stones—being thrown off in the reciprocating movement of the screens, and thence through the screens into the lower hopper, the perforations in which permit sand, dirt, and small seeds to fall into the body of the machine. From the lower hopper the grain is carried by the spout *d* into the trunk L, where it is subjected to a second separation from chaff, smut, &c., and from which trunk it falls in a clean condition. The vacuum formed in the fan-chamber by the rotation of the fan is increased or diminished by the proper use of the valve, seen upon the side of the eddy-chamber H, which, when entirely closed, develops the full power of the machine. The suction is then exerted in the trunk L, through which the chaff, &c., is drawn and deposited in the eddy-chamber H, from whence it passes into the spout C and is conducted to the ground. The partition W in eddy-chamber H occupies a sufficient portion thereof to prevent the chaff from entering the fan-chamber. The currents of air in passing through the suction-trunk are by means of the flanges given a rotary motion or whirl, and the greatest power of the whirl comes immediately after it leaves said flanges and passes upward through the suction-trunk, diminishing in whirl-power as the distance is increased from the flanges. I introduce the wheat in the suction-trunk from the spout immediately above and in proximity with the flanges, which are placed within and inclosed by the sides of the suction-trunk and near the said spout, where the greatest power of the whirl-currents upon the grain is produced and a cleaner and more perfect separation effected.

I am aware that flanges have been utilized for the purpose of creating rotary currents of air, and located only in the hood, in which arrangement the grain in falling in a body from above conflicts with a bottom separation and carries down considerable refuse matter with it through the flanges. The hood I find of no advantage in my invention, except to prevent the grain from scattering; and I do not claim any effect in the power of the separator by its use.

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

1. The combination, with the fan-chamber and the suction-fan, of the suction-trunk, the inclined flanges arranged in said trunk, as described, and the spout opening into said trunk in proximity to said flanges, as and for the purpose specified.

2. The combination, in a grain-separator, with the suction-trunk, of the obliquely-inclined flanges, arranged as described, and a rod, arranged transversely in said trunk and supporting the ends of said flanges, as described.

3. The combination, with the frame of the separator, the upper hopper having a slot at its delivery end and a delivery-passage for the grain, and a slide covering said delivery-passage, of a fixed guide, a spring within said guide, a pin attached to said slide, a belt attached at its upper end to said pin and at its lower end to the frame of the separator, and a rotating shaft having an eccentric arranged to contact with said belt, substantially as described, and for the purpose set forth.

JOHN L. LA ROSE.

Witnesses:
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ALEXANDER CAMP.