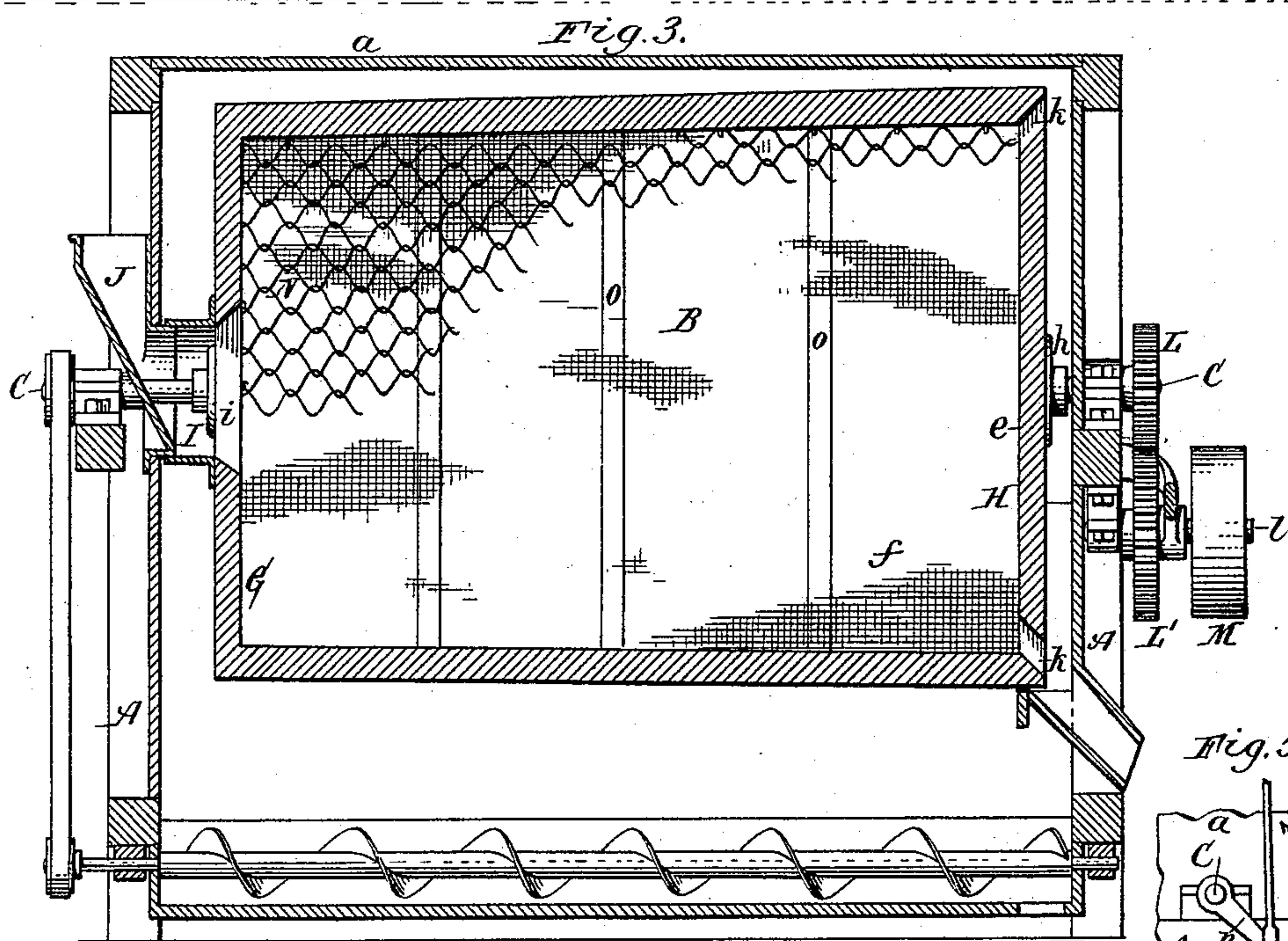
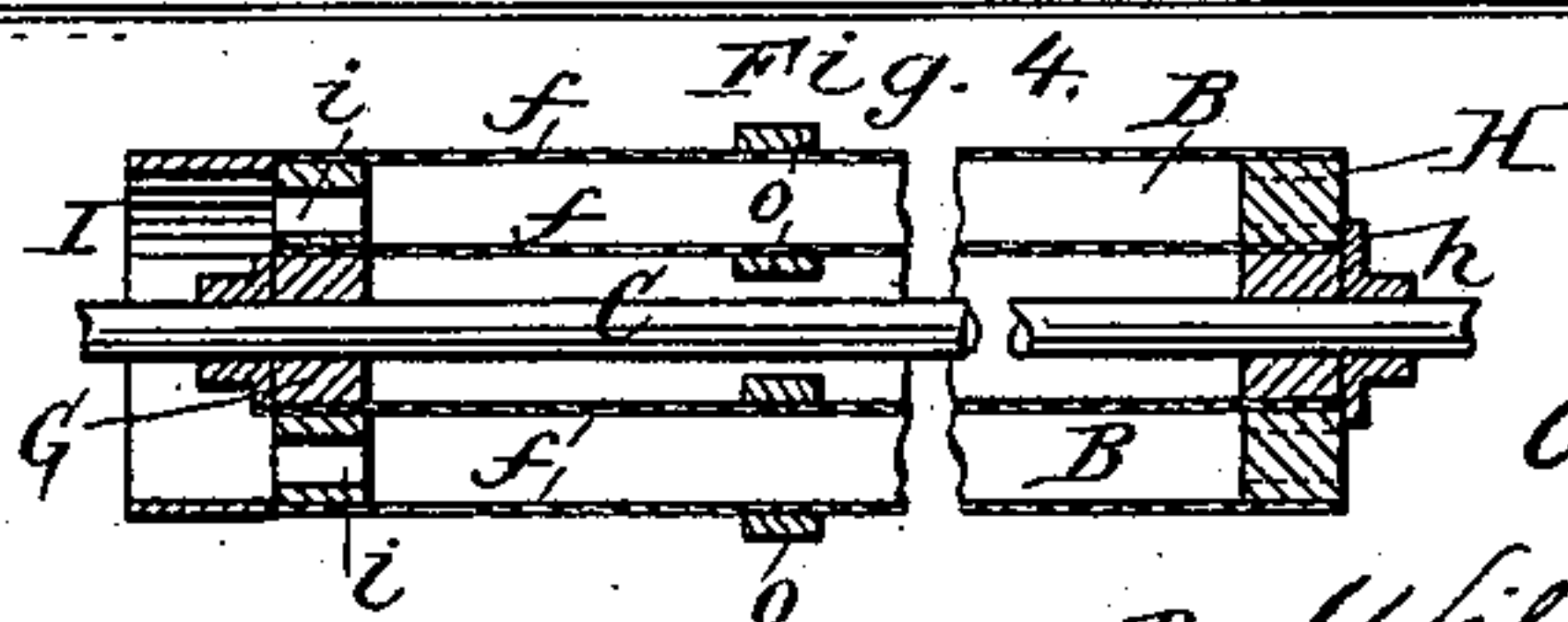



O. M. MORSE.
GRAIN SEPARATOR.

Patented June 10, 1890.



Chas. J. Buchheit.
Emil Penhart.



 O.M. Morse
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UNITED STATES PATENT OFFICE.

ORVILLE M. MORSE, OF JACKSON, MICHIGAN.

GRAIN-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 429,634, dated June 10, 1890.

Application filed July 2, 1889. Serial No. 316,281. (No model.)

To all whom it may concern:

Be it known that I, ORVILLE M. MORSE, a citizen of the United States, residing at Jackson, in the county of Jackson and State of Michigan, have invented new and useful Improvements in Grain-Separators, of which the following is a specification.

This invention relates to that class of grain-separators which contain a rotating or oscillating receptacle having flat screens on opposite sides, and in which the grain is elevated at intervals or intermittently by the rotation or oscillation of the receptacle and caused to flow over the screens.

The object of my invention is to construct a simple, compact, and efficient grain-separator of this kind in which the grain is thoroughly cleaned and polished without cutting or lacerating the bran.

In the accompanying drawings, Figure 1 is a vertical section of my improved grain-separator. Fig. 2 is an end elevation with part of the casing broken away. Fig. 3 is a longitudinal section of the machine. Fig. 4 is a longitudinal cross-section of the grain-receptacles. Fig. 5 is a fragmentary end elevation showing a modified construction of the driving-gear.

Like letters of reference refer to like parts in the several figures.

A represents the stationary frame of the machine, and *a* the inclosing-casing secured thereto.

B B represent two grain-receptacles, arranged lengthwise in the casing *a*. These receptacles are secured at their front and rear ends to a longitudinal shaft C, which is arranged between the receptacles, the latter being separated from each other by a space of sufficient width to permit of the free escape of the separated matter.

D is a partition-plate, which is arranged midway between the adjacent sides of the receptacles for the purpose of preventing the separated impurities passing through the screen of one receptacle from falling upon the screen of the other receptacle and entering the same.

Each of the grain-receptacles B is composed of a flat four-sided frame *e*, which is covered on both sides with screens *f f*, so as to form

a flat hollow receptacle having tight edges and two opposite reticulated sides. The front ends of both receptacles B B are secured to a connecting strip or head G, which is arranged between the receptacles and mounted on the shaft C, and the rear ends of both receptacles are secured to opposite sides of a similar head or connecting-strip H. The latter is secured to the shaft C by a hub or collar *h*.

I represents a feed-chamber, which is secured to the front side of the head G at the front ends of the grain-receptacles, and which receives the grain from a spout J, secured to the stationary frame of the machine. The grain passes from the feed-chamber I into the receptacles B B through openings *i*, formed in the front pieces of the frames of the receptacles. The longitudinal pieces of the frames of each receptacle preferably diverge rearwardly or toward the tail of the machine to cause the material to flow from the head to the tail of each receptacle and to escape finally from the discharge-opening *k*, with which each chamber is provided in each cross-piece; but, if preferred, the shaft and the receptacles may be inclined rearwardly for this purpose.

The shaft C is rotated preferably by elliptic gear-wheels L L' at the rear end of the machine, the driving-wheel L' being mounted on a short shaft *l*, to which the driving-pulley M is secured. These elliptic gear-wheels impart to the shaft a rotative movement of gradually increasing and decreasing angular velocity, the slow movement taking place during that portion of each revolution during which the grain-receptacles are in the inclined position, in which the grain flows downwardly over the screen, which position is indicated by dotted lines in Fig. 1.

N represents an agitating and distributing device arranged between the screens of each receptacle for the purpose of breaking up the mass of grain as it descends over the screen, thereby liberating the impurities which are commingled with the grain or adhere to the grain and enabling these impurities to be separated from the grain. This agitating device consists of coiled wires, as represented in the drawings; but it may be composed of straight wires or other suitable devices, which

are arranged between the screens and cause the mass of material to be divided or distributed. This agitating device also has a scouring action upon the kernels of grain, whereby the scouring effect of the screens is supplemented.

O represents the supporting-strips, which are secured to the outer sides of the screen-frames and extend across the screens, so as to support the same.

The grain in the receptacle is elevated at intervals by the rotation of the receptacles and then caused to flow down over the screen, whereby the impurities are detached and sifted out and the kernels of grain are scoured and polished. The cleaning or scouring is effected principally by friction or attrition, and the action of the machine is so gentle as not to break the kernels or cut or lacerate the bran.

The flat separating-receptacles afford proportionately large screen-surfaces and divide the material to be separated into comparatively thin layers, whereby the material is prevented from accumulating and moving over the screens in large bodies or masses and is brought into more intimate and direct contact with the screen-surfaces and with the distributors, whereby the separating and scouring capacities of the machine are greatly increased. The two parallel screens are separated by an open space which is open in all directions, and particularly in the two directions in which the separated material can be discharged by reason of the various inclined positions which the screens assume in rotating. This open space permits the separated dust, &c., to be discharged in either direction as soon as the angle of the screen causes the dust and grain to flow, thereby preventing any accumulation of the separated material.

My invention is particularly well adapted for scouring and separating grain; but it may be employed for the separation of other granular or pulverulent substances.

When the grain-receptacles are rotated as described, both screens of each receptacle are alternately brought into action; but when the motion is oscillating only one of the screens of each receptacle is operative as a separator. The oscillating motion can be produced by a rock-arm *p*, secured to the shaft C, as repre-

sented in Fig. 5, or by any other suitable means.

I claim as my invention—

1. The combination, with two rotating parallel receptacles, each provided with two parallel screens and each having feed and discharge openings at opposite ends, said receptacles being separated by a discharge space or passage open in both directions, of a rotating shaft arranged between the opposing flat ends of said receptacles, substantially as set forth.

2. The combination, with two rotating parallel receptacles, each provided with two parallel screens and each having feed and discharge openings at opposite ends, of a feed-chamber arranged at the head of both receptacles and communicating with the feed-openings thereof, substantially as set forth.

3. The combination, with two rotating parallel receptacles, each provided with two parallel screens and each having feed and discharge openings at opposite ends, of a partition-plate arranged between the two receptacles, whereby the material escaping from the adjacent screens is freely and separately discharged in either direction, substantially as set forth.

4. The combination, with two rotating parallel screens, of a distributor occupying the space between said screens from the upper to the lower end thereof in the direction in which the screens are inclined in rotating, whereby the material is repeatedly acted upon in passing over each screen, substantially as set forth.

5. The combination, with two rotating parallel screens, of a distributor of coiled wire occupying the space between the screens, substantially as set forth.

6. The combination, with a flat separating-receptacle provided with screens on opposite sides and an actuating-shaft to which the receptacle is attached, of elliptic driving-gears, whereby the receptacle is rotated alternately with a high and a low speed, substantially as set forth.

Witness my hand this 25th day of June, 1889.

ORVILLE M. MORSE.

Witnesses:

JNO. J. BONNER,
F. C. GEYER.