

(No Model.)

2 Sheets—Sheet 1.

J. M. KING.
SEPARATING GRAIN.

No. 435,542.

Patented Sept. 2, 1890.

Fig. 1

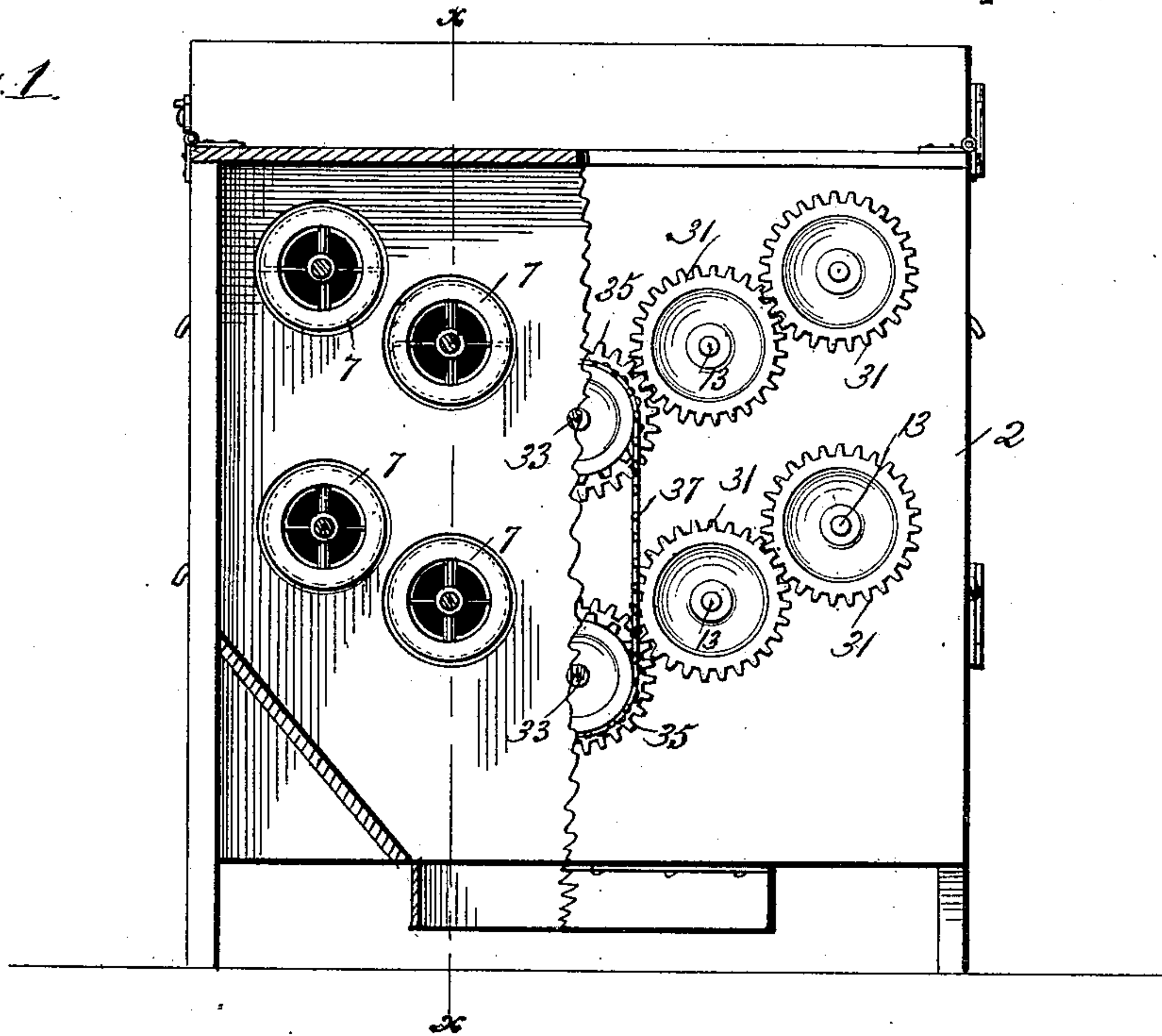
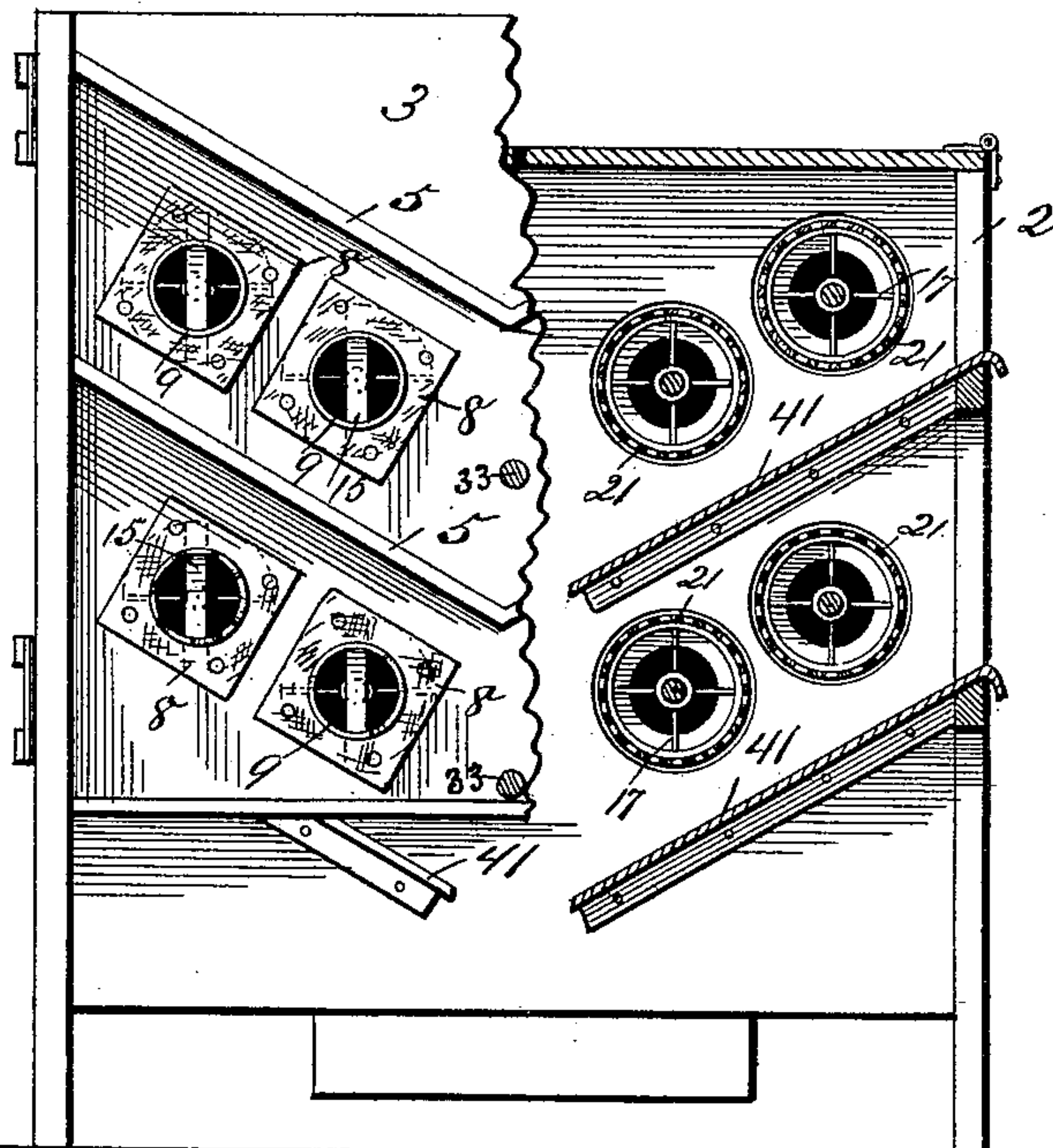


Fig. 2.



Witnesses.

J. Jessen.
A. M. Gaskill

Inventor.

James M. King.
By Paul M. King

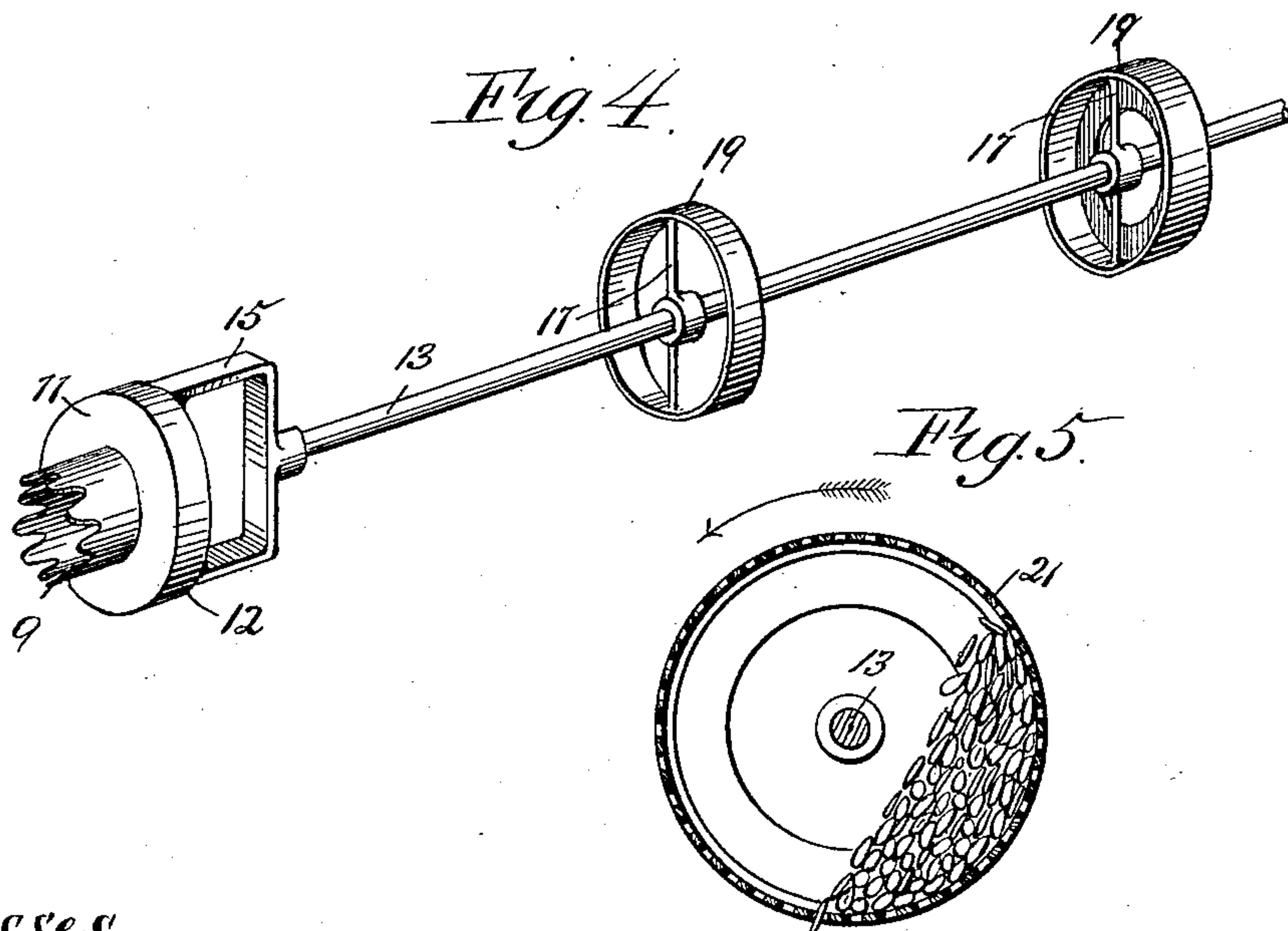
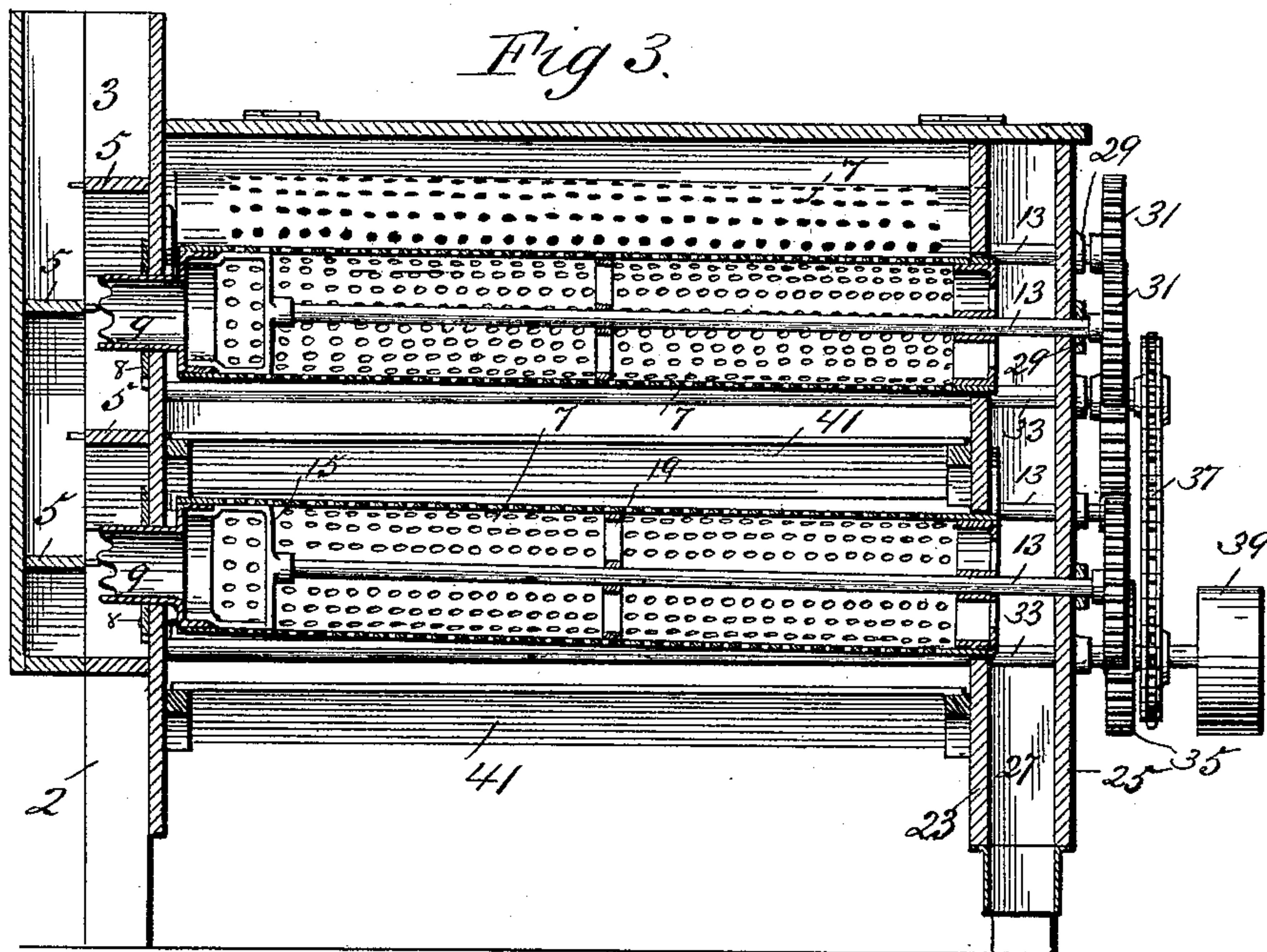
(No Model.)

2 Sheets—Sheet 2.

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SEPARATING GRAIN.

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Witnesses:

J. Jenson
a.m. Gaskill

Inventor:

James M. King.

By Paul M. Munn

Attorneys.

UNITED STATES PATENT OFFICE.

JAMES M. KING, OF ROCHESTER, MINNESOTA.

SEPARATING GRAIN.

SPECIFICATION forming part of Letters Patent No. 435,542, dated September 2, 1890.

Application filed April 28, 1890. Serial No. 349,739. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. KING, of Rochester, in the county of Olmsted and State of Minnesota, have invented certain Improvements in Separating Grain, of which the following is a specification.

This invention relates to improvements in a process of and apparatus for separating grain.

Considerable difficulty has heretofore been experienced in separating oats and other seeds from barley and wheat, owing to the fact that if the grain is passed over a screen or separator the oats, being of greater length than the barley or wheat, do not pass through any openings in the screen that are small enough to prevent the barley and wheat from passing through. As, however, oats are of less diameter than barley and wheat, if the grain can be brought so that the kernels strike endwise against the screen the oats will pass through openings that are small enough to prevent the passage of the barley or wheat.

My invention consists in a new method or process of separation by means of which the grain is moved so as to bring the oats and barley or wheat end foremost against the screen while passing longitudinally through it, thereby permitting the oats and seeds that are of less diameter than the openings or perforations in the screen to pass through the screen, while at the same time such seeds may be of such length that if brought lengthwise over the opening they would not pass through it.

The invention consists, further, in the construction and combination hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming a part of this specification, Figure 1 is a rear elevation partly in section. Fig. 2 is a front sectional view. Fig. 3 is a longitudinal section on line *xx* of Fig. 1. Fig. 4 is a perspective view of one of the screen-frames. Fig. 5 is a detail section of one of the screens, illustrating the process of separating the grain.

In carrying out my improved process I pass

a quantity of grain through a rotating cylindrical sieve, and retain at all times in the sieve a body of grain and cause the kernels of grain next the screen to be carried up by the screen until they reach the top of the body of grain in the screen and then to slide down over the inclined surface of the grain and strike end foremost against the surface of the screen. By this means the oats and other kernels of small diameter are brought endwise to the openings or perforations in the screen and pass through it.

In the accompanying drawings, 2 represents the frame-work or casing of the machine, which may be of any suitable size and construction. Arranged at one end of this casing is a hopper 3, which preferably extends the full width of the casing. A series of endwise-inclined shelves 5, projecting, preferably, about half-way through the hopper, are arranged on its opposite walls so as to alternate with each other. By this means the weight of the grain in the hopper is supported mainly by the shelves, so that the grain in each part of the hopper is not packed closely together.

The hopper is preferably made in two parts, being divided vertically, the sections being hinged or otherwise secured together, so that the hopper may be opened for convenience in manufacturing and for removing accumulations of dust, &c., as often as necessary.

Mounted in bearings in the casing are the cylindrical screens 7, preferably arranged in series, as shown in Figs. 1 and 2. Each screen consists, preferably, of an open tube 9, forming a journal upon one end of the screen and secured to a disk 11 and ring 12, a shaft 13, having a yoke 15 on its end secured to the ring 12, and spiders 17, carrying the rings 19. The screen proper 21, formed of perforated metal or other suitable material, is secured upon the rings 12 and 19. The shaft 13 projects beyond the end of the screen, as shown in Fig. 3. The rear end of the frame or casing is preferably made with a double wall 23 and 25, forming a trunk 27, through which the grain that passes through the end of the screen is discharged. The screens are mounted with the hollow journals 9 projecting into

the hopper, and with their rear ends extending through the inner wall 23, and with the shafts mounted in bearings 29 in the wall 25. Arranged upon the shafts 29, outside of the wall 25, are the gear-wheels 31.

I have shown two series of four screens each; but it will be understood that any number of series may be used and that there may be any number of screens in each series.

A shaft 33 is arranged between the central screens and is provided with a gear-wheel 35, intermeshing with the gear-wheels upon the adjacent screens. The shafts 33 are each provided with sprocket-wheels connected by a chain 37, and a belt-pulley 39 is preferably arranged upon one of these shafts, by means of which power may be applied to drive the machine.

An inclined gather board or plate 41 is arranged below each series of screens, and open spaces are left between the lower ends of these boards, so that all of the screenings are discharged through the center of the machine.

It will be seen that the hollow journals 9 extend into the hopper, and each journal is preferably provided at its end with a series of projections, preferably of serrated form, and these projections extending into the grain in the hopper stir it up and agitate it, so as insure the proper feeding of the grain into the ends of the tubular screens.

The screens 7, as before stated, are preferably in the form of tubes, and in constructing machines I prefer to make them of from two to six inches in diameter, and each screen is also provided at its rear or discharging end with an inwardly-projecting flange which leaves an open center, so that the grain discharged from the screen must pass over the top of this flange. This will insure the slow passage of the grain through the tubular screen, and will cause a considerable body of grain to be retained at all times in the tubular screen. The screens are preferably slightly inclined, the feed-openings are sufficiently large and the outlets sufficiently small to retain in the screen while in operation a depth of grain preferably equal to from one-sixth to one-half the diameter of the screen. By this process the grain within the tubular screen, as said tubes are rotated, is carried up slightly by the surface of the screen, and is then permitted to slide down over the inclined surface of the body of the grain in the screen until it strikes the screen again. This will cause the oats and the kernels of grain to strike the surface of the screen endwise, and the oats being of less diameter than the openings in the surface of the screen will pass through them, while the wheat or barley will be retained. By this process oats may be readily separated from barley or from wheat.

Arranged upon the inside of the hopper

and surrounding each tubular journal is a layer of cloth 8 or other suitable material for preventing dust, fine seeds, or other substances from working in around the journal.

I claim as my invention—

1. The process of separating oats from barley or wheat, which consists in passing the grain through tubular screens in which it is held to a considerable depth, rotating said screens, and thereby causing the grain next to the inner surface of the screen to be carried up to the top of the body of grain in the screen and then to slide down over the inclined surface of the body of grain in the screen, and to be brought endwise against the surface of the screen, substantially as described.

2. In a machine of the class described, the combination, with a suitable hopper provided with a series of inclined shelves, of a series of rotating tubular screens provided with hollow journals projecting into said hopper between said shelves.

3. The combination, with the hopper having the inclined shelves 5 arranged upon its opposite walls and alternating with each other, of the tubular screens having the hollow journals projecting into the said hopper.

4. The combination, with the hopper, of the tubular screens having the hollow journals projecting into said hopper and provided with serrated ends, and with a packing around said journals, and with a circular flange at its outlet end, whereby the grain is retained in the screen to the desired depth.

5. The combination, with the hopper, of the tubular screens provided with the hollow journals projecting into said hopper, and having serrated ends, for the purpose specified.

6. The combination, with the divided hopper adapted to be opened, of the tubular screens provided with the hollow journals extending into said hopper.

7. The combination, with the casing provided with the hopper 3 and the trunk 27, of the tubular screens provided with shafts 13, the yoke 15, secured to said shaft, the ring 12 upon said yoke, the disk 11, connected to said ring, and with the hollow journals 9, secured to said disk and arranged with said journals projecting into said hopper and with the discharge ends of the screens extending into said trunk, substantially as described.

8. The combination, with the casing 2, of the hopper extending across the end of the casing and with the discharge-trunk 27 at the other end of the casing, of the series of tubular screens provided with the hollow journals projecting into said hopper, and with the opposite ends of the screens arranged to discharge into said trunk, substantially as described.

9. The combination, with the casing 2, pro-

vided with the oppositely-inclined gather-
boards 41, arranged with open spaces be-
tween them, of the tubular screens arranged
above each of said gather-boards and pro-
5 vided with the hollow journals, and the feed-
hopper common to all of said screens, sub-
stantially as described.

In testimony whereof I have hereunto set
my hand this 11th day of April, 1890.

JAMES M. KING.

In presence of—

A. C. PAUL,

A. M. GASKILL.