

No. 668,860.

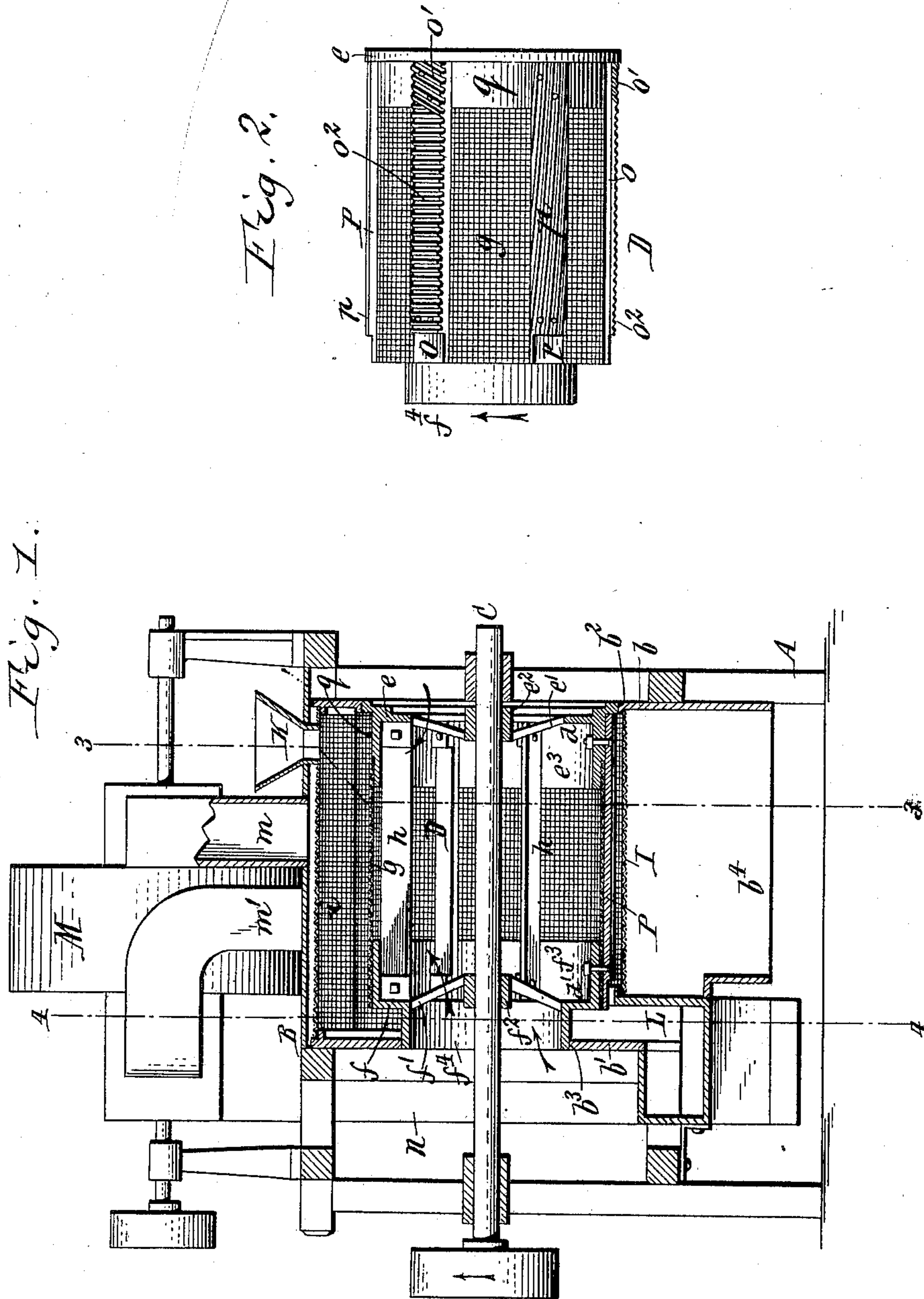
Patented Feb. 26, 1901.

C. S. RIDER.
GRAIN SCOURER.

(Application filed May 27, 1899.)

(No Model.)

2 Sheets—Sheet 1.



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2 Sheets—Sheet 2.

Fig. 4.

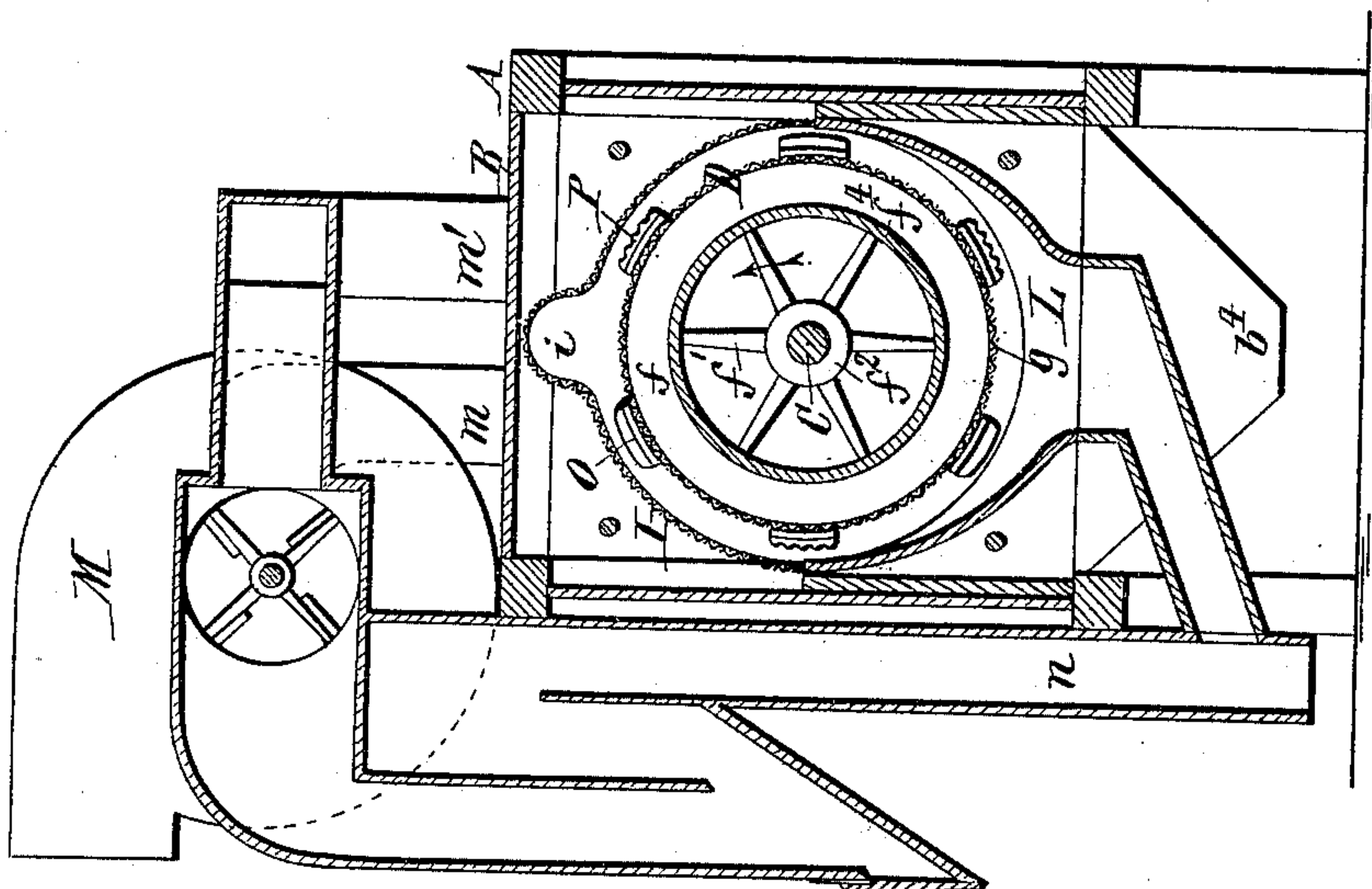
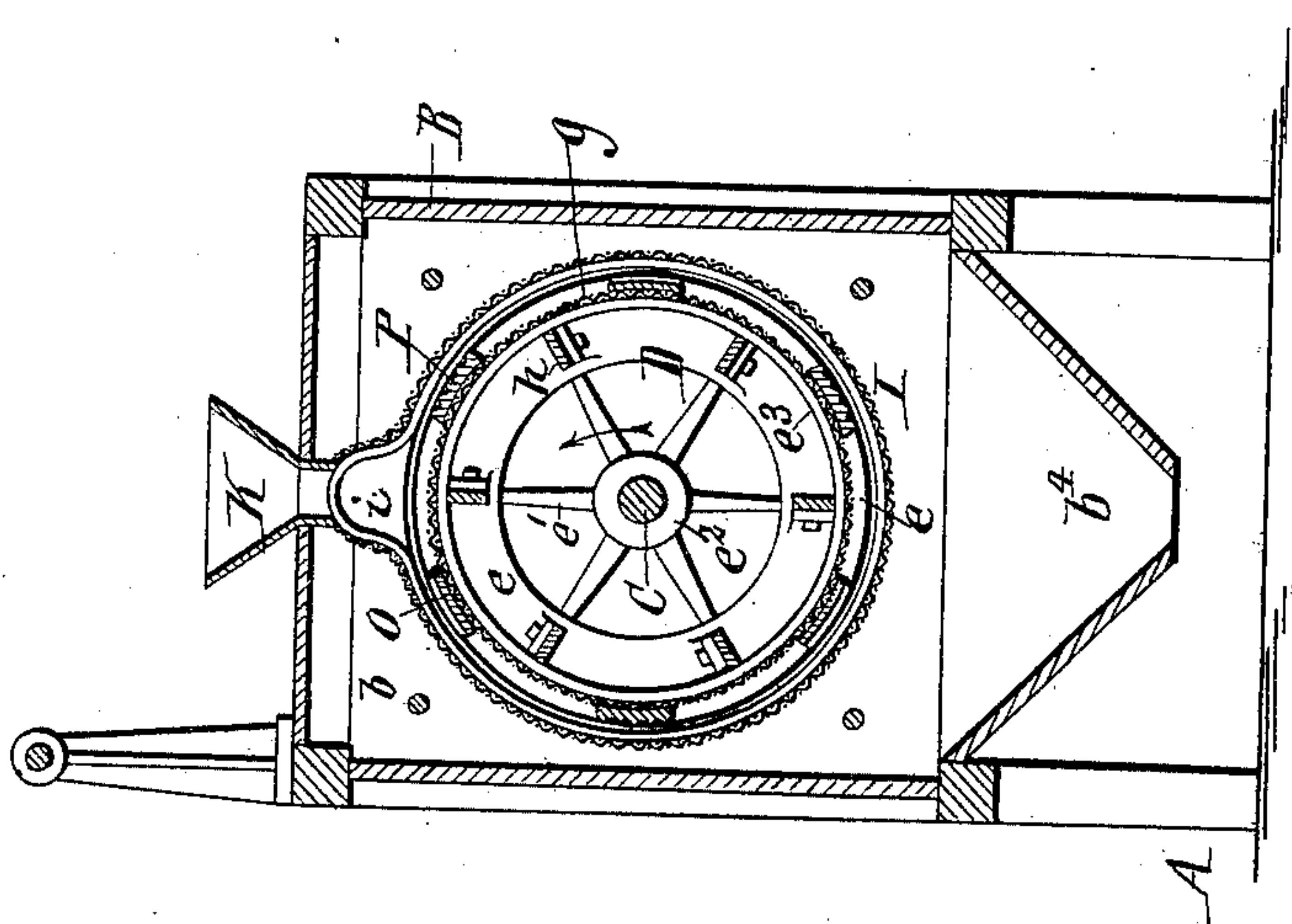


Fig. 3.



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UNITED STATES PATENT OFFICE.

CHARLES S. RIDER, OF SILVER CREEK, NEW YORK, ASSIGNOR TO THE
S. HOWES COMPANY, OF SAME PLACE.

GRAIN-SCOURER.

SPECIFICATION forming part of Letters Patent No. 668,860, dated February 26, 1901.

Application filed May 27, 1899. Serial No. 718,523. (No model.)

To all whom it may concern:

Be it known that I, CHARLES S. RIDER, a citizen of the United States, residing at Silver Creek, in the county of Chautauqua and State of New York, have invented new and useful Improvements in Grain-Scourers, of which the following is a specification.

This invention relates to that class of grain-scourers which consist, essentially, of a perforated scouring-drum having an internal air-supply, a perforated scouring-case surrounding the scouring-drum, and a tight inclosing case or air-chamber surrounding the scouring-case.

One of the objects of this invention is to subject the grain while being scoured to a more copious air-current, so that the grain is ventilated more thoroughly and the detached dust and other particles are carried off more rapidly.

Another object of this invention is to provide a relief pocket or pockets in the side of the scouring-case which permits the grain to temporarily free itself from the propelling devices, whereby the kernels of grain are permitted to change their position and all parts of the same are enabled to be thoroughly scoured.

My invention has the further object to arrange the ribs on the scouring-plates of the drum in such manner that the incoming grain is carried quickly away from the grain-inlet, so that the latter is prevented from becoming clogged, while the further forward movement of the grain is retarded, so as to subject the grain to a thorough scouring action.

In the accompanying drawings, consisting of two sheets, Figure 1 is a vertical longitudinal section of my improved grain-scourer. Fig. 2 is a side view of the scouring-drum. Figs. 3 and 4 are vertical transverse sections in lines 3-3 and 4-4, Fig. 1, respectively.

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

A represents the stationary main frame of the machine, and B the imperforate case which incloses the scouring device and which is provided in its front and rear walls or ends b b' with circular openings b^2 b^3 and in its bottom with an open hopper b^4 .

C represents the horizontal driving-shaft,

which extends centrally through the inclosing case and its openings b^2 b^3 and which is journaled in bearings on the main frame.

D represents a scouring-drum having circular spider or open heads d d' on its front and rear ends, which are mounted on the shaft. The front drum-head consists, essentially, of an outer ring e , which fits in the front opening b^2 of the inclosing case and turns therein, arms e' , connecting the ring with a hub e^2 on the shaft, and an annular or cylindrical flange e^3 , extending inwardly from the ring e . The rear head consists of an outer ring f , which is separated from the rear wall of the inclosing case by an intervening space, arms f' , connecting the ring with a hub f^2 on the shaft, an annular or cylindrical flange f^3 , extending inwardly from the rear ring, and a cylindrical tube f^4 , extending outwardly from the rear ring across the space between the latter and the rear wall and turning snugly in the rear opening b^3 of said wall.

g represents the cylindrical screen or clothing of the scouring-drum, which preferably consists of woven wire and is secured at its front and rear ends to the flanges of the front and rear drum-heads. The air is admitted into the interior of the scouring-drum through both of its open heads and is driven outwardly through the screen by fan blades or wings h , which are engaged lengthwise on the inner side of the screen and secured with their ends to the rings of the front and rear drum-heads.

I represents a perforated scouring-case which surrounds the scouring-drum and is separated from the latter by an intervening space or chamber, through which the wheat or grain to be scoured passes. The main portion of this scouring-case has the form of a plain cylinder and is secured with its ends to the inner sides of the front and rear walls of the inclosing case. The scouring-case is provided with a laterally-projecting relief pocket or chamber i , into which the grain is thrown by the scouring-drum, and the position of the grain with reference to the scouring-surfaces is changed so as to scour all sides thereof. This pocket is preferably arranged in the upper part of the scouring-

case, along the whole length thereof, and is formed by offsetting or deflecting the upper part of the scouring-case. The scouring-case and its relief-pocket are made of woven wire or other perforated material.

K represents a feed-spout whereby the grain to be scoured is fed into the space between the scouring drum and case and which extends through the top of the inclosing case and the relief-pocket at the front end thereof.

L represents a discharge-spout whereby the scoured grain is carried away and which is connected with the rear end of the scouring-case below the space in rear of the drum and extends laterally.

The grain delivered by the feed-spout into the head end of the scouring-space passes lengthwise through this space and then discharges from the tail end thereof through the delivery-spout. In its passage through the scouring-space the grain is carried around the scouring-case by the scouring-drum, and the dust particles and other loose particles are detached from the grain by the attrition of the kernels of grain against each other and against the screen-surfaces of the scouring drum and case. In the normal operation of the machine the scouring-space is filled with grain, and the kernels of grain maintain the same position while being carried around by the scouring-drum. When the kernels of grain arrive opposite the relief-pocket, they are thrown by the drum during each rotation of the latter into the pocket and are temporarily relieved from the rotary carrying action of the drum, and then the kernels are again caught by the drum and carried around another turn in the scouring-case. As the kernels of grain are thrown into the pocket they rebound more or less from one side of the pocket to the other, whereby the ends of the kernels are scoured and polished, and the kernels are turned and mixed, so that all of the kernels and all sides of each kernel are brought into contact with the scouring-surfaces before they are discharged from the scouring-space. The kernels also have an opportunity to separate in this pocket from each other to a greater extent than while they are under control of the drum, whereby the air-current is enabled to pick up and remove the detached impurities more readily and completely while the kernels are moving about in the pocket.

M represents the case of an air-exhaust fan whereby the impurities which are detached from the grain during the scouring operation are separated from the grain and carried off. This fan-case is mounted on top of the main frame and has its eyes connected by air-exhaust pipes or trunks $m\ m'$ with the top of the space surrounding the scouring-case. The inlet ends of these trunks are preferably arranged on opposite sides of the relief-pocket of the scouring-case, as shown in Fig. 4, and out of line lengthwise, as shown in Fig. 1. The suction produced by the fan causes a

current of air to pass from the open hopper b^4 upwardly through the space around the scouring-case to the fan and carry away any light particles which pass through the scouring-case. The air entering the ends of the scouring-drum is forced by the blades of the latter through the grain in the scouring-space and into the space surrounding the scouring-case, whereby the light particles are carried off to the fan as soon as they are detached from the grain. By providing an air-inlet at both ends of the scouring-drum an abundant air-supply is obtained and the separation of the dust from the grain is promoted. By arranging the inlets of the air-trunks or air-pipes $m\ m'$ one behind the other and adjacent to the relief-pocket the air-suction is distributed and operates upon the grain while the same is in a loosened condition, thereby enabling the dust to be easily separated therefrom. The discharge-spout L of the scouring-space empties into a final air-trunk n , which connects with one of the eyes of the fan and which removes the remaining light impurities from the grain.

O and P represent two sets of scouring plates or bars which are arranged lengthwise on the outer side of the drum. Both sets of plates serve to scour the grain during its passage from the feed-spout to the discharge-spout, but the plates O have the additional function of feeding or propelling the grain rearwardly from the feed-spout and clear the outlet thereof, while the plates P have the additional function of retarding the rearward movement of the grain after passing the outlet, so as to subject the grain to a thorough scouring action. The scouring-plates O and P alternate with each other, and each plate is secured at its front end to the flange of the front drum-head and at its rear end to the flange of the rear drum-head. Each of the plates O is provided at its front end, below the feed-spout K, with a short series of oblique propelling-ribs o' and in rear of the feed-spout with a long series of non-propelling-ribs o^2 , which extend circumferentially with reference to the drum. The oblique ribs o' cause the grain delivered upon the drum to be carried quickly away from underneath the feed-spout, so as to avoid clogging the grain-inlet, and the circumferential ribs o^2 agitate the grain and aid in scouring the same. The scouring-plates P are each provided with a series of oblique ribs p , which are arranged lengthwise of the plate and trend slightly backward in the direction for counteracting or retarding the movement of grain from the front to the rear end of the scouring-space, thereby always retaining the scouring-space full of grain and insuring thorough scouring of the grain before it is discharged.

The grain is delivered by the feed-spout directly on top of the scouring-drum, so that the grain is immediately set in motion and clogging of the machine at the inlet is avoided. The rear or discharge end of the scouring-

space is open fully around the entire drum, thereby providing a free discharge for the grain and preventing clogging of the machine or breaking of the grain at the outlet.

5 The cylindrical portion of the annular flange of the front head, which is arranged below the feed-spout, is imperforate and perfectly plain or solid, as shown at *q*, Figs. 1 and 2, and the screen of the scouring-drum extends rearwardly from this plain portion, thereby avoiding undue wear upon the front end of the drum-screen, which otherwise would take place if this screen extended underneath the feed-spout. The grain issuing
15 from the spout strikes the plain surface *q* of the front head and is immediately carried rearwardly and distributed over the entire front end of the scouring-surfaces by the oblique ribs *o'* of the scouring-plates *O*.

20 I claim as my invention—

1. The combination with the inclosing case provided in its front and rear walls with circular openings, of a rotary, perforated scouring-drum provided at opposite ends with open
25 heads which communicate with said openings, a stationary, perforated scouring-case surrounding said scouring-drum and secured to the inclosing case, a feed-spout which opens into the front portion of said scouring-case, a discharge-spout connected with the
30 rear end thereof, and a suction-spout which opens into the space between the perforated scouring-drum and the inclosing case, whereby air is drawn into the scouring-drum through both ends thereof and through the
35 perforated wall of the scouring-drum into the space between the latter and the scouring-case, and thence into the suction-spout, substantially as set forth.

40 2. The combination with the inclosing case provided in its front and rear walls with circular openings, of a perforated scouring-drum provided at its front end with an open circular head which communicates with the open-
45 ing of said front wall and at its rear end with an open head which is separated from said rear wall by an intervening space, a cylindrical tube extending from said rear head across said space and turning in the open-
50 ing of said rear wall, a stationary perforated scouring-case surrounding said scouring-drum and secured to the inclosing case, a feed-spout which opens into the front portion of said scouring-case, a discharge-spout con-
55 nected with the scouring-case below said space in rear of the drum, and a suction-spout which communicates with the space between the perforated scouring-drum and the inclos-

ing case at a point located between the front and rear ends of said case, substantially as
60 set forth.

3. The combination with the rotary scouring-drum, of a surrounding stationary scouring-case composed of a plain cylindrical per-
65 forated main portion and an outwardly-projecting perforated relief-pocket which extends along the upper portion of the scouring-case from the front to the rear end thereof, an imperforate case inclosing the perforated scouring-case, and a suction-spout con-
70 nected with said imperforate case, substantially as set forth.

4. The combination with the horizontal scouring-drum, of the perforated cylindrical scouring-case surrounding the drum and pro-
75 vided on its upper side with a pocket which extends lengthwise of the case, a feed-spout opening into said pocket over the front end of the drum, and a discharge-spout connected with the case at the rear end of the drum, sub-
80 stantially as set forth.

5. The combination with the inclosing case provided in its front and rear walls with circular openings, of a perforated scouring-
85 drum provided at its front end with an open circular head which turns in the opening of said front wall and at its rear end with an open head which is separated from said rear wall by an intervening space, said drum being provided with a longitudinal, feeding
90 scouring-plate provided below the feed-spout with a series of oblique propelling-ribs and in rear of said spout with a series of non-propelling circumferential ribs, and with a longitudinal retarding scouring-plate provided
95 with a series of oblique ribs which trend backwardly, a cylindrical tube extending across the space in rear of the drum and connected at its inner end to said rear head and turning with its outer end in the opening of said
100 rear wall, a perforated scouring-case inclosing said drum and connected with said inclosing case, a feed-spout connected with the top of the scouring-case over the front end of the scouring-drum, a discharge-spout connect-
105 ed with the scouring-case below the space in rear of the drum, and a suction-spout which opens into the space between the scouring-drum and the scouring-case, substantially as
110 set forth.

Witness my hand this 22d day of May, 1899.

CHARLES S. RIDER.

Witnesses:

FRED. W. THOMAS,
WALTON C. BARBEAN.