

(No Model.)

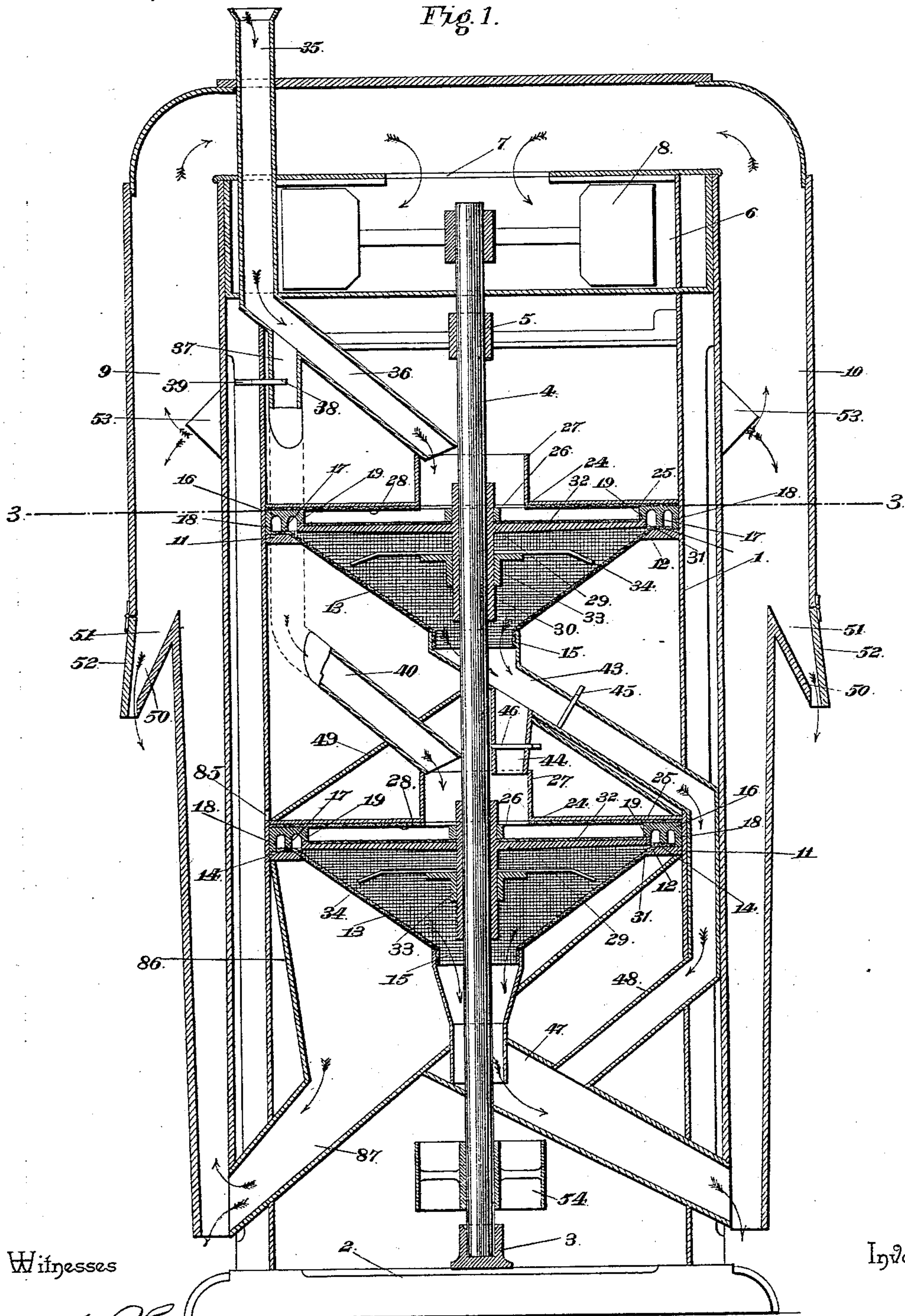
3 Sheets—Sheet 1.

P. PROVOST.
GRAIN SCOURING MACHINE.

No. 457,795.

Patented Aug. 18, 1891.

Fig. 1.



Witnesses

Inventor

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(No Model.)

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Fig. 2.

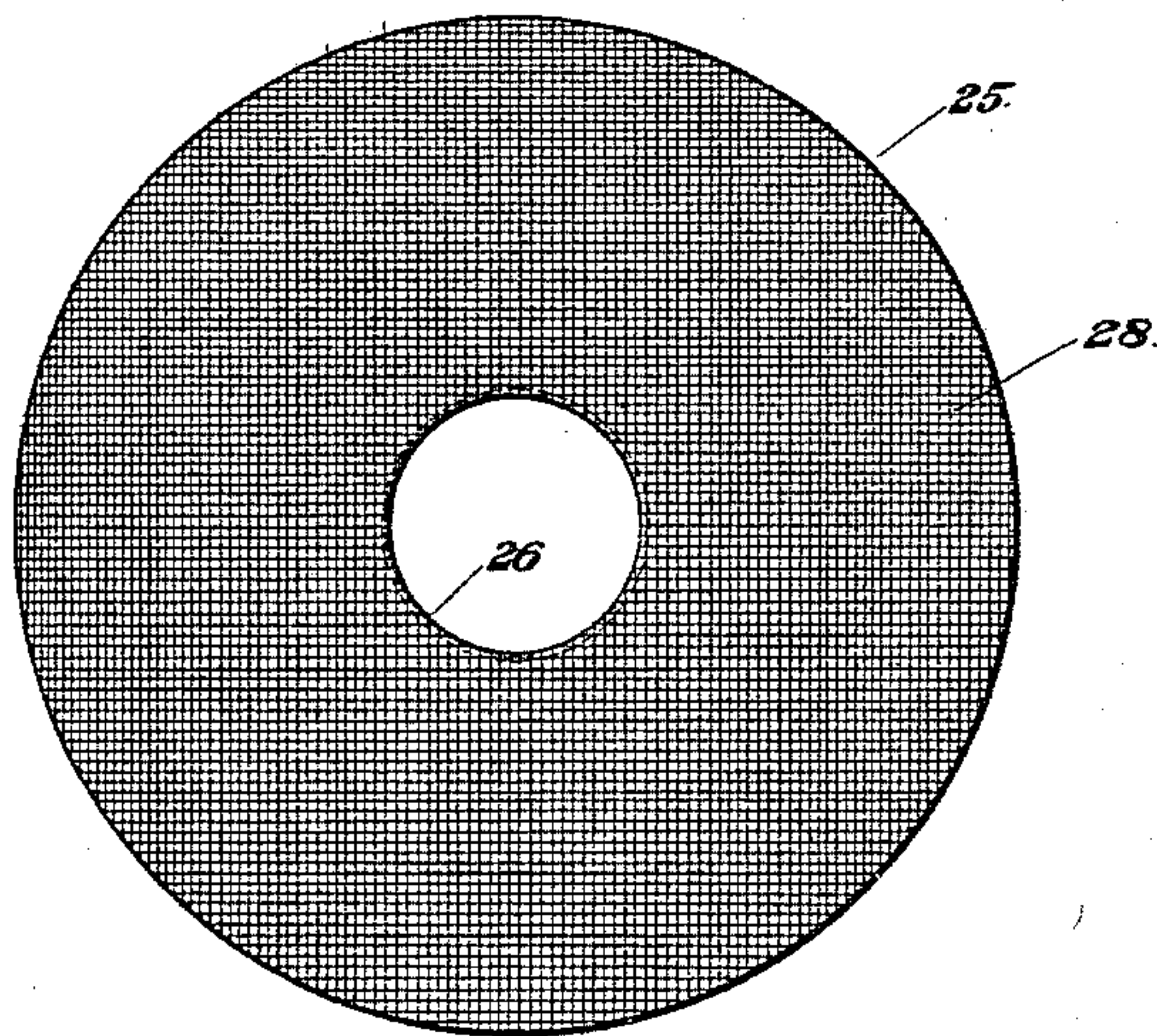


Fig. 3.

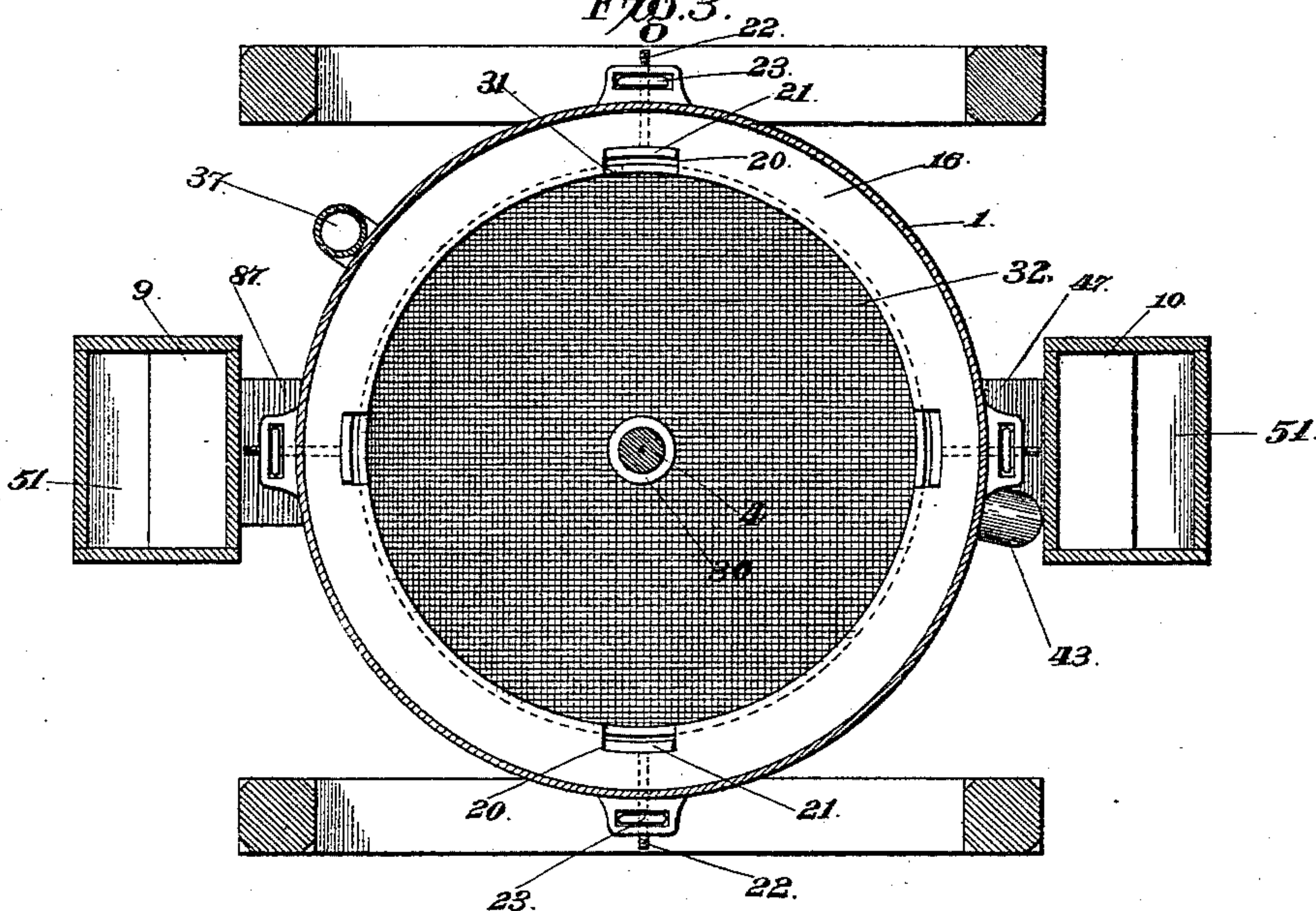
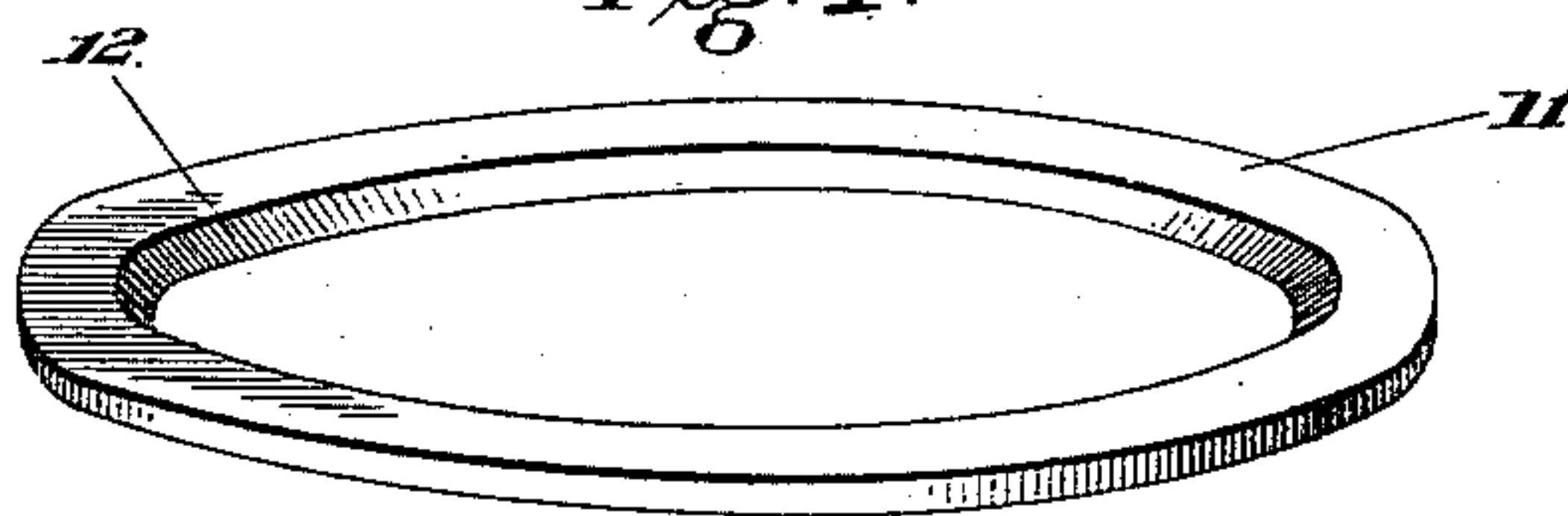


Fig. 4.



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Fig. 5.

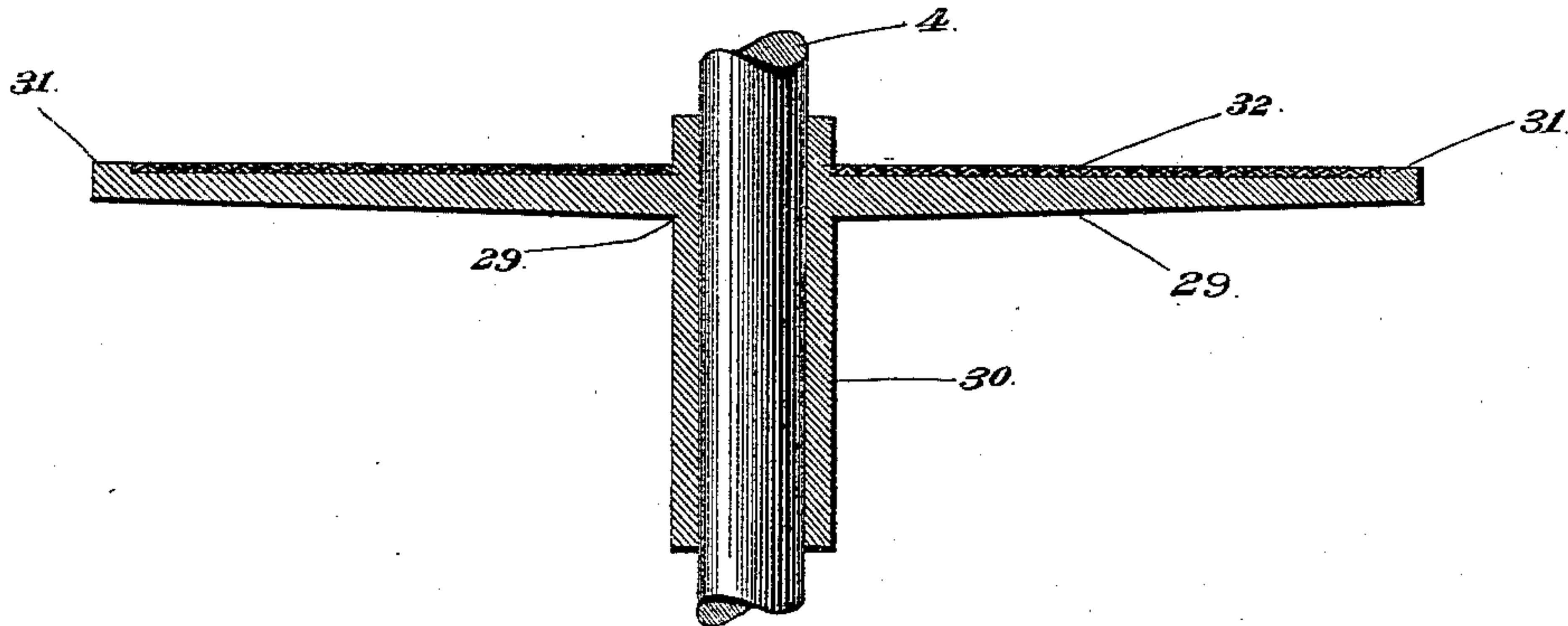


Fig. 6.

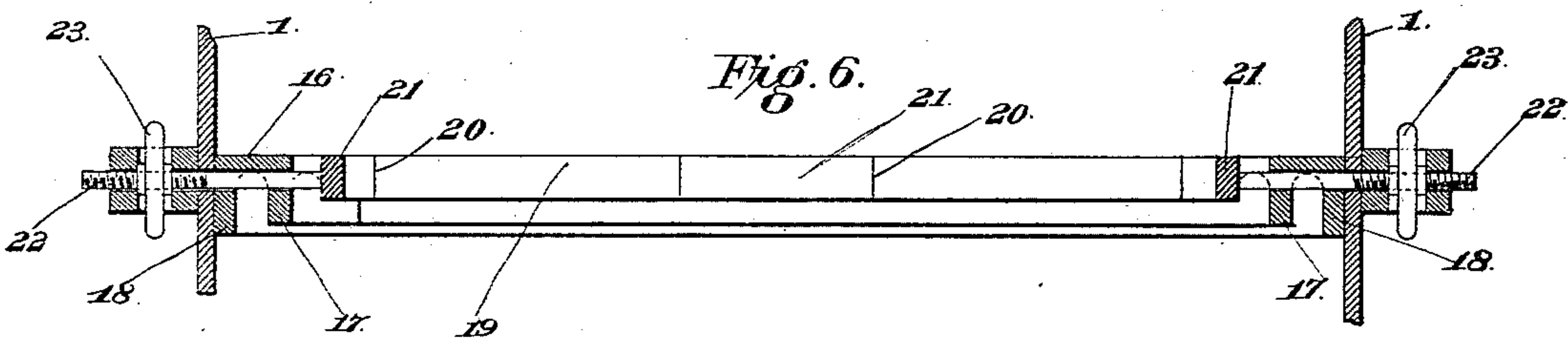
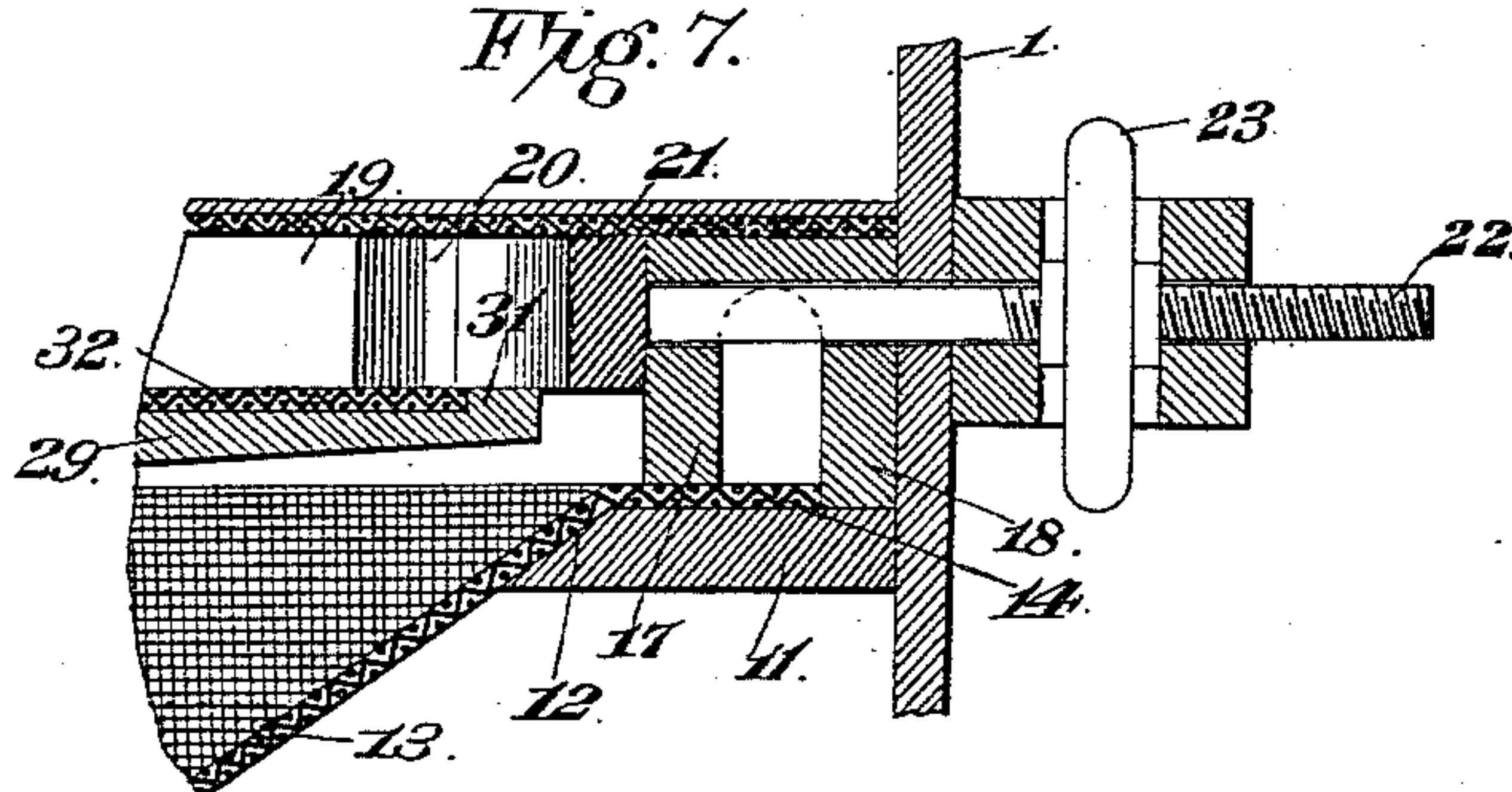


Fig. 7.



Witnesses

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UNITED STATES PATENT OFFICE.

PETER PROVOST, OF MINNEAPOLIS, MINNESOTA.

GRAIN-SCOURING MACHINE.

SPECIFICATION forming part of Letters Patent No. 457,795, dated August 18, 1891.

Application filed January 30, 1891. Serial No. 379,666. (No model.)

To all whom it may concern:

Be it known that I, PETER PROVOST, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented a new and useful Grain-Scouring Machine, of which the following is a specification.

This invention has relation to machines for cleaning and scouring wheat and other grain, and it may be described as being an improvement on the device for which Letters Patent of the United States No. 398,538 were granted to myself on the 26th day of February, 1889.

My present invention has for its object to construct a machine of this class which shall combine simplicity with durability and effectiveness in operation; and it consists in the improved construction, arrangement, and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, Figure 1 is a vertical sectional view of a grain-scouring machine embodying my improvements, the casing being partly broken away to expose the upper end of the exterior spout 37, which is shown in section. Fig. 2 is a detail bottom plan view of one of the stationary scouring disks or diaphragms. Fig. 3 is a horizontal sectional view taken on the line 3 3 in Fig. 1 and looking in a downward direction. Fig. 4 is a detail view of the supporting-rim flange for one of the stationary disks. Fig. 5 is a sectional detail view of one of the revolving scouring-disks mounted upon the shaft of the machine. Fig. 6 is a sectional detail view of the supporting-rim, showing the slides for regulating the passage of the grain. Fig. 7 is an enlarged detail vertical sectional view of a portion of one of the scouring devices and supports, showing the grain-passage therethrough.

Like numerals of reference indicate like parts in all the figures of the drawings.

The casing 1 of my improved grain-scouring machine is cylindrical in shape and is mounted upon a base 2, which latter is provided with a step 3, in which is mounted the lower end of a vertical shaft 4, the upper end of which has a bearing in the top plate 5. The cylindrical casing is extended above the said top plate to form the fan-case 6, the upper side of which has the centrally-located

inlet 7. A fan 8 is mounted upon the upper end of the shaft 4, within the casing 6, and the inlet 7 of the latter is connected with the tubes or spouts 9 and 10, which extend vertically on diametrically-opposite sides of the casing. Suitably secured within the casing are the annular supporting rings or flanges 11, of which there may be any desired number, which are to be arranged suitable distances apart. These rings or flanges, which are preferably made of cast-iron, are for the purpose of supporting the stationary parts of the scouring and cleaning mechanism, and the inner edges of said rings are beveled in a downward direction, as will be seen at 12. In the drawings hereto annexed two of these supporting-rings have been shown, this number being usually deemed sufficient. Each of these rings supports, first, a conical screen or hopper 13, which may be made of perforated sheet metal or of wire-cloth of suitable mesh and provided at its upper edge with a flange 14, whereby it is supported upon the upper side of the ring 11. The beveled inner edges of the rings 11 serve to accommodate the tapering or conical edges of the said screens. The lower ends of the latter are formed with downwardly-extending flanges 15, adapted to be connected with the upper ends of conveying-spouts, to be hereinafter more fully described.

Upon the flanges 11, above the flanges 14 of the conical screens 13, are mounted the annular supporting-rims 16, each of which is provided with annular supporting-feet 17 and 18, the outer ones of which 18 are shorter than the inner ones, so as to rest upon the upper sides of the flanges 14, while the outer long feet 18 rest directly upon the supporting-ring 11. At their inner edges the rims 16 are provided with depending flanges 19, having cut-away portions or recesses 20, in which are located slides or cut-offs 21, having outwardly-extending screw-threaded shanks 22, that extend through the casing of the machine and are provided with hand wheels or nuts 23, by means of which the said slides may be adjusted. The hand-wheels 23 may be suitably swiveled to the casing, so as to keep them from radial movement with relation to the axis of the latter.

Upon the upper sides of the rims 16 are mounted the stationary scouring-disks 24.

Each of these is composed of a sheet-metal disk 25, having a central opening 26, surrounded by an upwardly-extending flange 27, and to the under side of each of the said disks is permanently bolted a disk 28, of wire-cloth of suitable mesh, which constitutes the scouring-face. The flange 27 of each of the said disks surrounds the vertical shaft of the machine and is of sufficient dimensions for the admission of grain.

Suitably mounted upon the shaft 4, directly below each of the stationary scouring-disks, is a revolving scouring-disk 29, which is composed of a cast-iron disk having a hub 30 and provided at its upper edge with a flange 31, which bears against the under side of the flange 19 of the adjacent supporting-rim 16. Upon the upper side of each of the disks 29 is bolted a wire disk 32, which, together with the adjacent wire disk 28, constitutes the scrubbing mechanism of the device.

Upon the shaft 4, underneath each of the disks 29 and within each of the hoppers 13, is mounted a spreading device consisting of a hub 33, having radially-extending fingers or spreaders 34, the outer ends of which are bent slightly in a downward direction.

35 designates the inlet-spout, which extends through the top of the casing and has an inclined branch 36, which is extended into the flange 27 of the uppermost scouring-disk 24. A branch 37, which extends downwardly from the inclined spout 36, passing without the casing but within the frame-work of the machine, is provided near its upper end with a regulating slide or valve 38, which may be provided with a handle 39, extending through the casing, to enable the said slide to be readily manipulated. The branch spout 37 has an inclined lower end 40, protruding within the next lower chamber and which is extended into the flange 27 of the second scouring-disk 24. If additional scouring-disks are used, additional conducting-spouts are to be provided, and these are to be so arranged and provided with regulating slides or valves that the supply of grain to the several scouring-disks may be cut off and regulated at will.

The flange 15 at the lower edge of the uppermost conical screen or hopper is connected with the upper end of an inclined conducting-spout 43. The spout 43 has near its upper end a downwardly-extending branch 44, which extends into the receiving-flange 27 of the scouring mechanism next below. Regulating slides or valves 45 and 46 are arranged in the spouts 43 and 44, respectively, so that the passage of grain through either of said spouts may be cut off at will. Spouts 40 and 44 are also to be provided with any suitable means through which the passage of grain may be observed by the operator, who is thus enabled to regulate the quantity of grain passing into the machine without danger of choking the latter. The flange 15 at the lower edge of the lower screen or hopper 13 is connected by means of an inclined spout 47 with

the lower end of the spout 10. A suitably-arranged inclined spout 48 connects the spout 47 with the lower end of the spout 43.

A suitably-arranged conical conducting plate or deflector 49 is arranged below the upper screen or hopper 13 to convey the dust and screenings to the openings 85 in the casing at the corners of the frame-work. A hopper 86, having a discharge-spout 87, is arranged below the lower screen 13 to convey small wheat, dust, and screenings to the lower end of the spout 9.

Each of the spouts 9 and 10 is provided with a downwardly and outwardly extending flange 50, forming a receptacle 51, having a hinged door 52. Triangular deflectors or abutments 53 are arranged short distances above the flanges 50, forming the compartments or receptacles 51. The lower ends of the spouts or compartments 9 and 10 are open for the passage of grain.

The lower end of the shaft 4 is provided with a pulley 54 to receive a band, the ends of which may be extended through suitable slots in the side of the casing to connect the said pulley with motive power of any suitable description.

The operation and advantages of my invention will be readily understood from the foregoing description, taken in connection with the drawings hereto annexed, by those skilled in the art to which it appertains. The grain, which may have been previously moistened in any suitable manner either by steam or water, is fed through the spout 35 and through the several branches of the said spout to the scouring-disks. It will be observed that by properly adjusting the slides or valves the grain may be supplied to the upper scouring mechanism alone direct from the spout 35. This is done when it shall be desired to subject the grain to the successive actions of the several scouring mechanisms, in which event the slide 45 is closed and the slide 46 is opened, thus causing the grain to pass from the upper hopper 13 to the scouring mechanism located next below. When the action of a single set of scouring-disks shall be deemed sufficient to complete the operation upon the grain, the slide 46 is closed and slide 45 is opened, while the slide 38 is likewise opened to cause a portion of the grain to pass direct to the lower scouring mechanism. The grain as it enters between the scouring-faces 28 and 32 of the disks 25 and 29, respectively, is caused by the centrifugal action of the revolving disk to pass in an outward direction, while at the same time the grains are rapidly rolled and tumbled about, and thus subjected to the abrading action of the wire disks between which it passes. From between the said disks the grain may pass through the openings 20 in the rim 16 and under the flange 19 of the latter. It will be seen that by properly adjusting the slide 21 the escape of the grain from the scouring-disks may be perfectly regulated and that any one or more of the escape-

openings may be completely closed, if desired. From between the scouring-disks the grain passes into the hopper underneath, and finally, in the manner described, to the outlet at the lower end of the spout or compartment 10. The dust and screenings that escape through the upper foraminous hopper 13 will be conveyed by the inclined conical deflector 49 to the outlets 85 in the casing. The small wheat and screenings will pass through hopper 86 and spout 87 to the lower end of spout 9.

During the above-described operation the fan 8 is rapidly revolved, thus creating suction in the chamber or casing 6 and forming partial vacuums in the spouts or compartments 9 and 10. The doors 52 are meanwhile kept closed. The heavier particles—namely, the small wheat and the cleaned wheat—will escape through the outlets at the lower ends of said spouts. The lighter parts will be sucked in an upward direction. On striking the triangular abutments 53 in the compartments 9 and 10, respectively, the screenings and the cockle will be separated from the dust and brought down into the compartment 51. From thence it may be afterward removed by opening the doors 52. The dust passes upwardly and into the fan-case, from whence it is blown out through openings in the sides of the casing.

My improved scouring and cleaning machine, as will be seen from the foregoing description, is exceedingly simple and compact in its construction, and the passage of grain through the said machine may be perfectly regulated, so as to cause the grain to be operated upon for any length of time that may be deemed necessary to complete the operation. This, of course, may be readily determined by observing the condition of the grain escaping at the outlet of the machine.

Having thus described my invention, what I claim is—

1. In a grain-scouring machine, the combination of a stationary and a revolving scouring-disk having their opposing faces covered with wire-cloth, a supporting-ring, a series of openings located in said ring and at the periphery of said disks, and regulating-slides arranged in the said openings, substantially as and for the purpose set forth.

2. In a grain-scouring machine, the combination of a stationary and a revolving scouring-disk, an annular rim supporting the former and having the downwardly-extending annular flange bearing against the edge of the latter, said flange being provided with a series of openings, and the regulating-slides mounted in the said openings, substantially as and for the purpose set forth.

3. In a grain-scouring machine, the combination of an annular supporting-flange, the conical foraminous hopper supported upon said flange, the supporting-rim mounted upon the flange at the upper edge of said hopper and having a depending annular flange at its inner edge, provided with a series of openings,

the regulating-slides mounted in said openings, the scouring-disk mounted upon the annular supporting-rim and having a central grain-inlet, and a revolving scouring-disk arranged below and bearing against the depending annular flange of the supporting-rim, substantially as and for the purpose set forth.

4. The combination of the supporting-flange having a beveled inner edge, the foraminous hopper having at its upper edge a flange resting upon the beveled supporting ring or flange, and the superimposed supporting-rim provided with annular supporting-feet of unequal height and with an annular depending flange having a series of openings provided with regulating-slides, substantially as and for the purpose set forth.

5. In a grain-scouring machine, the combination of a casing, a stationary supporting-rim, a foraminous hopper mounted upon the latter, and the superimposed supporting-rim supporting a stationary scouring-disk having a central grain-inlet, said supporting-rim being provided with a depending flange having a series of openings and regulating-slides, and a revolving scouring-disk mounted upon a central shaft and provided at its outer edge with a flange bearing against the under side of the depending flange of the supporting-rim, substantially as herein set forth.

6. In a grain-scouring machine, the combination of a casing, a series of scouring devices, each comprising a stationary and a revolving disk and a foraminous hopper, and a series of spouts and regulating-slides for conveying the grain direct to each scouring mechanism independently of the rest and thence to the outlet, or from each scouring mechanism to the scouring mechanism located next below, as may be desired, substantially as and for the purpose herein set forth.

7. In a grain-scouring machine, the combination of the casing, the fan-case having a central inlet, the vertical shaft carrying the fan, a series of stationary scouring-disks supported upon rims having openings provided with regulating-slides, the stationary foraminous hoppers, the scouring-disks and spreaders arranged upon the revolving shaft, and a series of conducting-tubes and regulating-slides, all arranged as herein described, and the spouts located exteriorly upon the casing and having their upper ends connected with the inlet of the fan-case and having the triangular abutments and the sub-compartments formed in the outer chamber of each of the said spouts and having the hinged doors, substantially as and for the purpose herein set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

PETER PROVOST.

Witnesses:

GEORGE E. LALELAIR,
M. MCEACHERN.