

No. 636,054.

J. J. MURPHY.

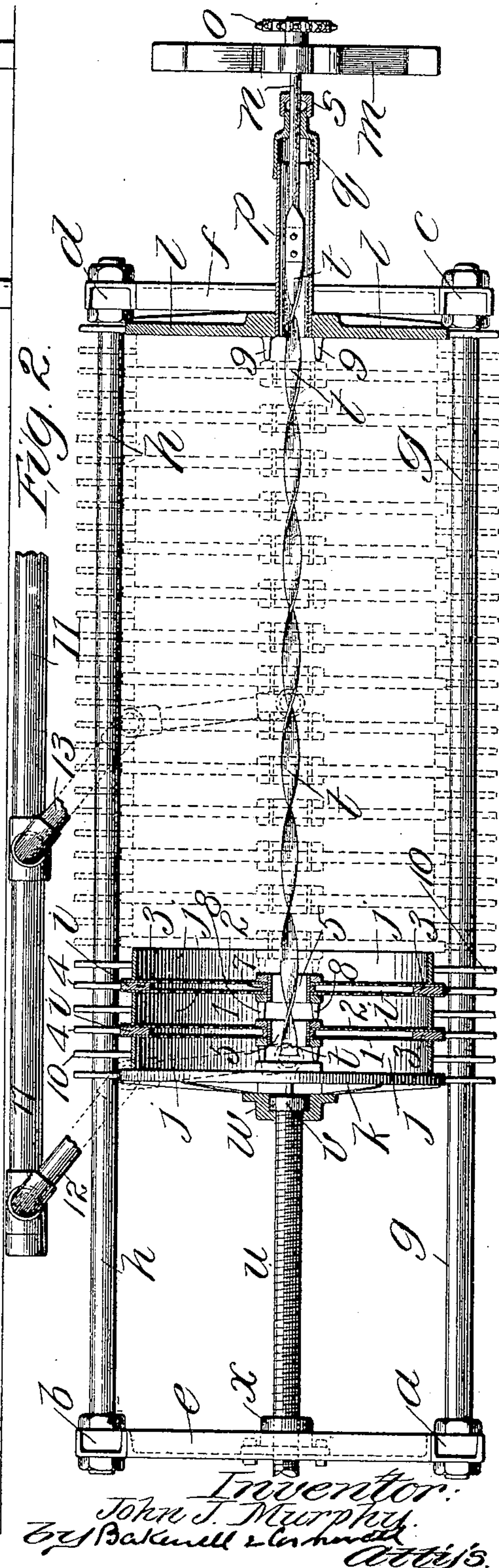
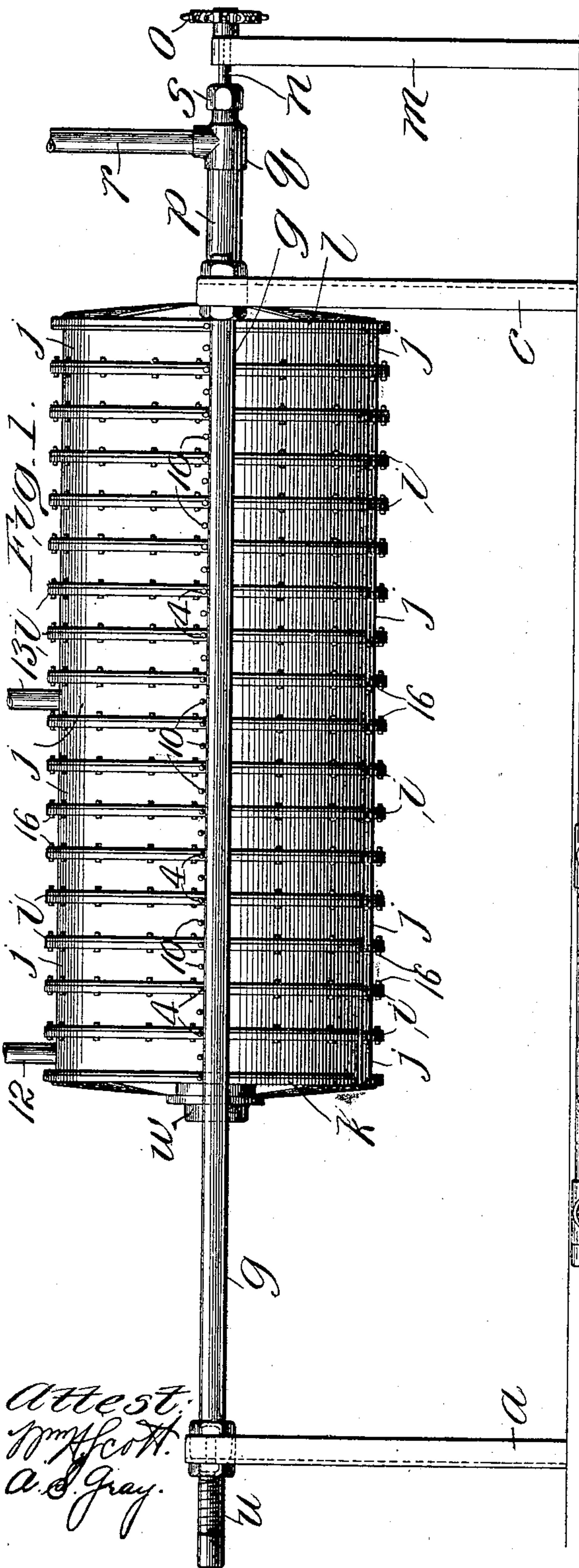
Patented Oct. 31, 1899.

STRAINER.

(No Model.)

(Application filed July 24, 1899.)

2 Sheets—Sheet 1.



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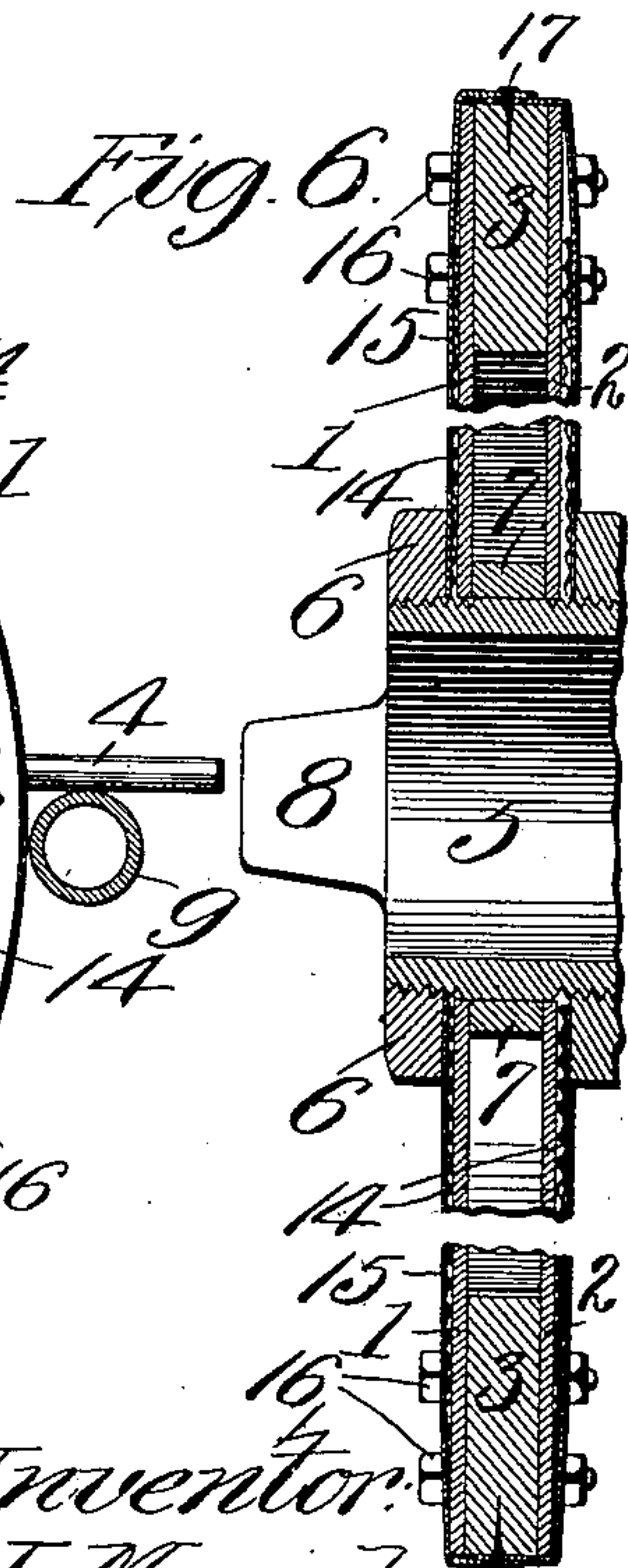
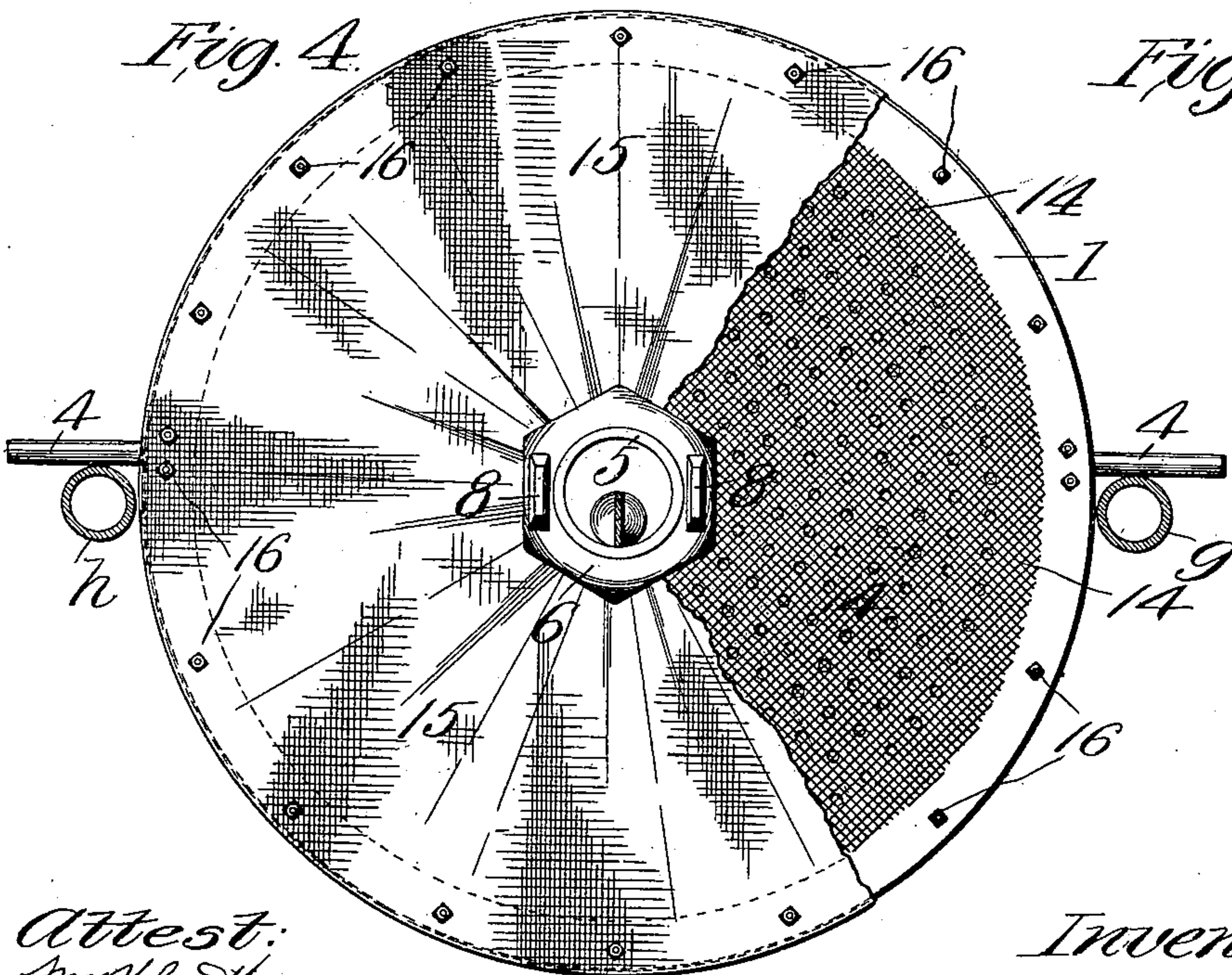
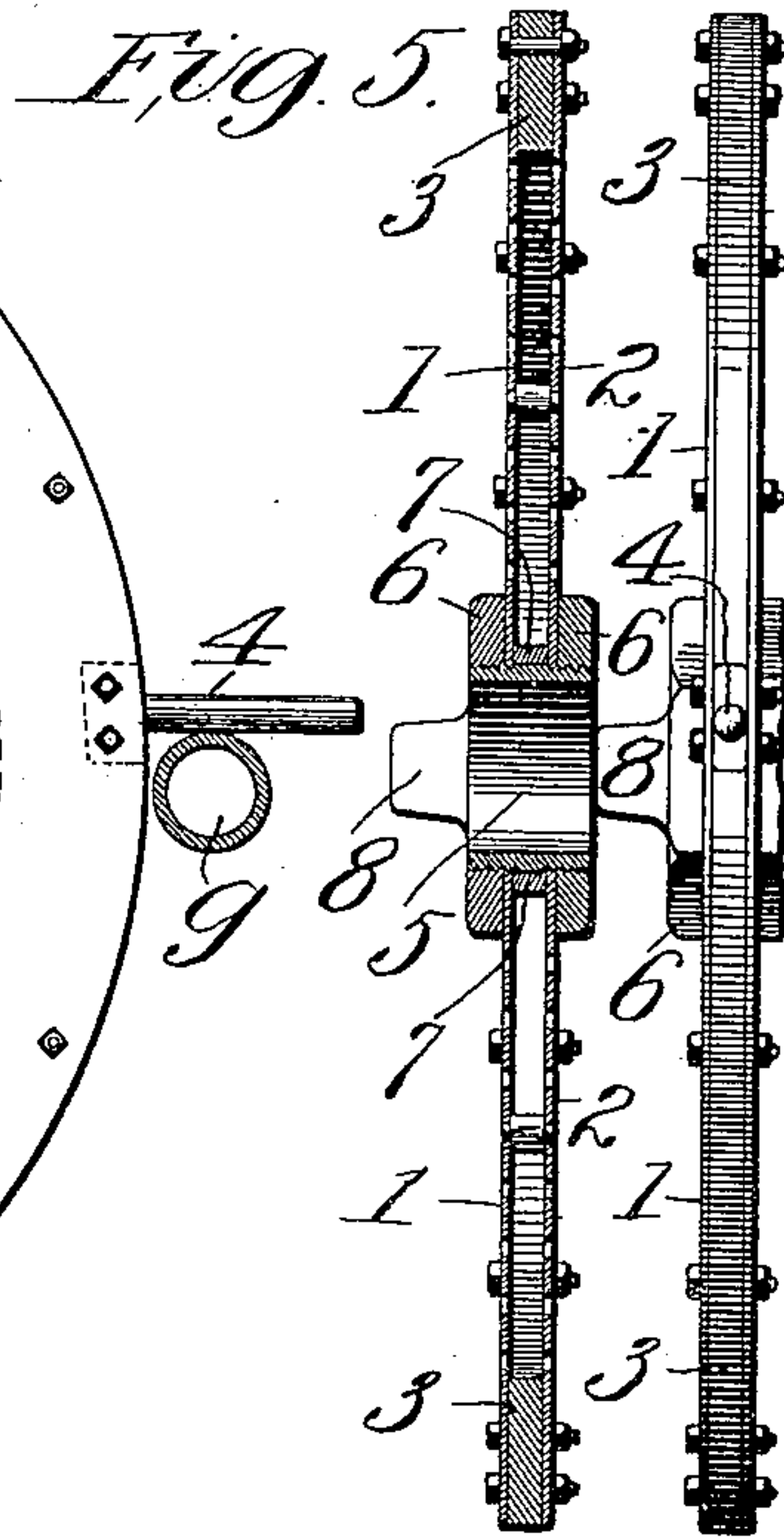
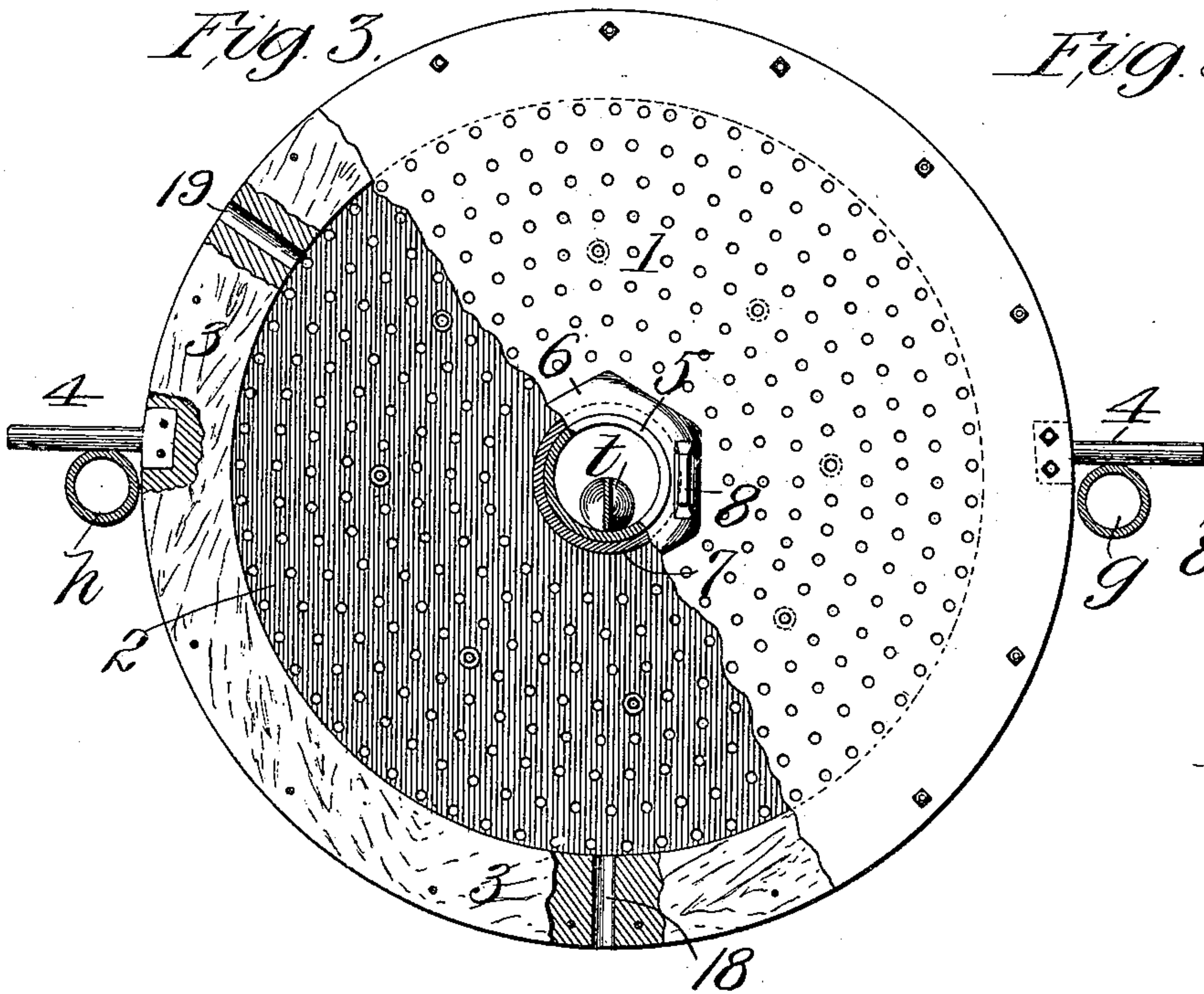
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

JOHN J. MURPHY, OF VINCENNES, INDIANA, ASSIGNOR TO THE T. S. TEUSCHER COMMISSION COMPANY, OF ST. LOUIS, MISSOURI.

STRAINER.

SPECIFICATION forming part of Letters Patent No. 636,054, dated October 31, 1899.

Application filed July 24, 1899. Serial No. 724,943. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. MURPHY, a citizen of the United States, residing at Vincennes, county of Knox, State of Indiana, have
5 invented a certain new and useful Improvement in Strainers, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference
10 being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevational view of my improved strainer. Fig. 2 is a plan view of the same, partly in section. Fig. 3 is an enlarged face view of one of the strainer-disks,
15 parts being broken away to more clearly illustrate its construction. Fig. 4 is an enlarged view of the same, illustrating thereon a wire screen and a fabric covering, the latter being partially broken away to reveal said screen.
20 Fig. 5 is an enlarged view of two of said strainer-disks, one of which is shown in vertical section, while the other is in side elevation; and Fig. 6 is a vertical sectional view,
25 on a still larger scale, of the same parts, being broken away to economize space.

This invention relates to a new and useful improvement in strainers, being particularly designed for straining or separating liquor
30 from what is known as distillery "slop"—that is, the wet, mealy mass which results from "mash" and which is designed to be separated from the liquid in order to collect the meal subsequently used for various purposes, such as food for cattle. It is quite
35 obvious, however, that this invention can be employed in straining various substances, and hence I do not wish to limit myself to any particular use to which it may be put.

40 The essential features of this invention are, first, in the novel construction of the strainers proper; second, in the novel construction of the heads of the strainer as an entirety, and, finally, the invention consists in the novel
45 construction and arrangement of the several parts, all as will hereinafter be more fully described, and afterward pointed out in the claims.

Heretofore strainers proper of this character have been constructed of suitable material, usually wood, and provided upon their

faces with suitable semicircular grooves, over which faces was placed cloth or other fabric, such as burlap. This construction was objectionable for the reason that when the slop
55 was pumped into the strainer under pressure the fabric was forced into the grooves, thus preventing the free flow of liquor there-through, resulting in choking the machine. Under these circumstances the machine had
60 to be taken apart and cleaned. In my improved strainer this objection is completely overcome, as will be clearly understood from the following description.

In the drawings, *a*, *b*, *c*, and *d* represent
65 suitable standards or supports, which are preferably made of commercially-rolled iron or steel, the standards *a* and *b* being connected at their upper ends by a transverse beam *e*, while the standards *c* and *d* are likewise
70 connected by a beam *f*, said beams *e* and *f* being also preferably made of commercially-rolled metal. *g* and *h* represent cylindrical rods or tubes, which are designed to connect at their upper ends the standards *a* and *c* and
75 *b* and *d*, respectively. This framework thus formed by the standards *a*, *b*, *c*, and *d*, the transverse beams *e* and *f*, and the rods or tubes *g* and *h* is designed to support my improved strainer, which is composed of a plu-
80 rality of strainers proper or sieves *i*, distanced from each other by suitable rings *j*, and two heads *k* and *l* are arranged at the ends of the device.

m indicates a suitable standard or support
85 arranged some distance away from the standards *c* and *d* and designed to serve as a bearing for a shaft *n*, which shaft *n* has mounted thereupon a sprocket-wheel *o*, through the instrumentality of which power is applied to
90 said shaft, as is obvious.

The head *l*, which is next adjacent to the standards *c* and *d*, is designed to be practically stationary, inasmuch as it is not intended to be moved after once being placed in position, and secured to the center of this head
95 *l* and extending outwardly therefrom is a tube or pipe *p*, which is fitted at its outer end with a T-joint *q*, one member of said T-joint being fitted with a conduit-pipe *r*, while another
100 of its members, the one axially in line with the member in which the pipe *p* is fitted, is

provided with a stuffing-box *s*, designed to pack the shaft *n*, which passes therethrough. This shaft *n* is provided with the sprocket-wheel *o* and extends into and has attached
5 to its inner end a twisted bar or screw conveyor *t*, which is of a length almost equal to the total length of the strainer as an entirety.

u represents a clamping-screw whose inner end is designed to bear against the outer face
10 of the head *k*, said screw being formed with an enlarged head *v*, which coöperates with a keeper *w*, secured to said head *k*, the purpose and function of which is to cause the head *k* to move outwardly when the screw *u* is with-
15 drawn, as will be readily understood.

x represents a nut bolted or otherwise secured to the beam *e*, said nut being designed to coöperate with the clamping-screw *u*, as is obvious.

20 I will now describe the construction of the sieves *i* and the rings *j* and call particular attention to Sheet 2 of the drawings.

As illustrated in Figs. 3, 4, 5, and 6, the sieve *i* is formed by bolting or otherwise se-
25 curing two perforated plates 1 and 2 to a ring or short tubular wooden band 3, although it is quite obvious that this sieve might as well be constructed wholly of metal either by casting or stamping. Secured to each side of
30 this sieve *i* and preferably some little distance above center are arranged in any suitable manner short rods 4, designed to rest upon the upper edge of the tubes *g* and *h*, and thereby suspend said sieve.

35 5 indicates a short length of pipe which passes through suitable axial openings in the plates 1 and 2 and extends therebeyond a sufficient distance to receive upon its externally-screw-threaded ends nuts 6. Surrounding
40 this pipe 5 and between the plates 1 and 2 is arranged a distance-collar 7, and when the nuts 6 are tightly screwed home a rigid water-tight joint between these parts is effected. One of the nuts 6 is provided with integral
45 distance-pieces or lugs 8, formed on its outer face, which lugs 8 are designed to arrest the longitudinal movement of the next adjacent sieve or, in other words, abut against the nut of the next adjacent sieve, as is clearly illus-
50 trated in Figs. 2 and 5 of the drawings.

The head *l* is provided with one or more inwardly-projecting lugs 9, which serve the same purpose as do the lugs 8 on the nuts 6, just referred to, in that said lug or lugs 9 limit the
55 longitudinal movement of the next adjacent sieve. (See Fig. 2.)

The rings *j* are simply short sections of a tube and are designed to be placed between the sieves *i* and are provided with short rods
60 10, which in purpose and function are identical with the rods 4 of the sieve in that they rest upon the tubes *g* and *h*, and thus support their carried ring.

11 indicates a main conduit-pipe, which is
65 provided with branch pipes 12 and 13, which branch pipes are designed to open into the rings *j* at suitable distances along the strainer

as an entirety. These branch pipes may be flexible, if desired, or may be provided with a gas-pipe joint, which latter construction is
70 illustrated in dotted lines in Fig. 2 of the drawings.

14 indicates a wire screen which is placed on each side of the sieve, and 15 a fabric cov-
75 ering placed over said screen, said screen and fabric being both firmly held in place by the nuts 6, while the outer edge of the screen is left unfastened. The fabric, however, is addi-
80 tionally secured by the bolts 16, which secure the plates 1 and 2 to the wooden ring 3. The raw edges of the fabric are thus folded over the edge of the sieve and tacked or nailed to the same, as at 17. (See Fig. 6.)

The operation of the device just described is as follows: When the strainer is clamped
85 into the position shown in the drawings, the liquid mass—such, for instance, as distillery slop—is pumped under pressure into the main conduit-pipe 11, whence it finds its way, through its branches 12 and 13 and also the
90 pipe *r*, which may be one of its branches, into the rings *j*, and after filling the rings, which are connected by said branches, is forced by the pressure of the pump through the pipe 5 into the next adjacent ring, and so on until
95 all of the rings are filled. During this filling of the rings the liquor from the mass is forced by pressure, through the fabric 15, wire screen 14, and the perforations in the plates 1 and 2, to the interior of the screen, whence it has
100 exit through the opening 18 and is finally conducted to any suitable place. After the deposit which is retained by the rings *j* has more than half filled all of said rings it is ob-
105 vious that the communication between the rings formed by the pipes 5 will to a great extent choke the strainer or, in other words, prevent this mass of deposit from passing freely through said pipes 5, and in order to obviate this difficulty I employ the screw
110 conveyer *t*, which, when the machine is being used, is kept constantly rotating. This screw conveyer tends to carry the deposit from one end of the machine to the other, which is not so important as keeping these pipes 5 open
115 or partially open, whereby communication is easily established between the rings. After the strainer has been completely filled with the deposit and all or nearly all of the liquor has been expressed therefrom the supply is
120 stopped and the clamping-screw *u* is withdrawn, which withdrawal also carries outwardly the head *k*, and then the first ring *j* is slid outwardly a convenient distance and rocked, whereby the collected mass or pulp-
125 like substance is easily removed. The next sieve is then slid outwardly, and then the next ring, and so on until all of the rings have been separated and their contents removed for the purpose of being dried and
130 used for any purpose desired.

After constant or long use I find that some small particles of the deposit will pass into the interior of the sieve or between the plates

1 and 2, or frequently the fabric covering of the sieves will become clogged, and in order to cleanse the same I form at any convenient place around the edge of said sieve an opening 19, and through this opening I am enabled to introduce a blast of steam or a jet of hot water, and thus scour and clean the interior. After removing the deposit and cleaning the sieves in the manner above described the machine is again assembled by sliding the rings and sieves as far as they will go, each one limiting the movement of the other, until all have been properly placed, and then the clamping-screw is turned in the proper direction to firmly clamp the parts together, after which the machine is ready for another charge.

I am aware that minor changes in the arrangement, construction, and combination of several parts of my device can be made and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

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

1. In a sieve or strainer the combination with two perforated plates separated a suitable distance, a short section of pipe passing through said perforated plates, and spacing-lugs 8 secured to at least one of the projecting ends of said pipe; substantially as described.

2. In a sieve or strainer the combination with two perforated plates, of a spacing-ring interposed between the peripheries thereof, a pipe axially arranged relative to said sieve or strainer and passing through said perforated plates, a distance-piece encircling said pipe for separating the centers of the plates, nuts on the ends of the pipe for clamping said plates to said distance-piece, and spacing-lugs on at least one of said nuts; substantially as described.

3. In a sieve or strainer, the combination with a peripheral spacing-ring, perforated plates arranged on each side thereof, a pipe which passes through alining openings in said plates, a distance-piece around said pipe between the plates, and means for clamping the plates to said distance-piece; substantially as described.

4. The combination with perforated plates, of a spacing-ring for separating the same, wire mesh arranged exteriorly said plates, and fabric arranged over said wire mesh for securing the same in position on the plates; substantially as described.

5. In a sieve or strainer, the combination with a peripheral spacing-ring, of perforated plates arranged on each side thereof, a pipe passing through said plates, nuts on the ends of the pipe, at least one of which is provided with a spacing lug or lugs, said peripheral spacing-ring being formed with an opening leading to the exterior; substantially as described.

6. The combination with a series of alined strainers, of independently-movable spacing-rings *j* interposed therebetween, and adapted to receive the material to be strained, each of said strainers comprising a hollow body portion with perforated sides, pipes passing through said body portion establishing communication between the space, within the rings *j*, and means for forcing the material under pressure into the space within the several rings *j*, through said pipes; substantially as described.

7. The combination with a peripheral spacing-ring, of perforated plates arranged on each side thereof, a pipe 5 passing through said perforated plates and having its ends projecting therebeyond, a distance-piece 7, surrounding said pipe and interposed between said perforated plates, and nuts on each end of the pipe for clamping the plates against the distance-piece; substantially as described.

8. The combination with a peripheral spacing-ring, of perforated plates on each side thereof, a pipe passing through said perforated plates and having its ends projecting on each side thereof, screens arranged outside of said perforated plates, fabric arranged over said screens, means for securing the edges of said fabric in position, and clamping devices on the projecting ends of said pipe for securing the middle portions of said fabric and screens in place; substantially as described.

9. In a sieve or strainer, the combination with perforated sides, spacing devices arranged therebetween at different points, wire mesh arranged exteriorly the hollow body thus formed, and fabric which covers the side faces of said sieves and is secured to the edges of said hollow body portion; substantially as described.

10. The combination with a series of strainers, each comprising a hollow body portion with perforated sides, and a pipe extending through said body portion and projecting some distance each side thereof, spacing-rings *j* interposed between each of said strainers, spacing devices approximately at the centers of several strainers for supporting the same and permitting communication between the pipes and the space within the rings *j*, and a clearing-blade extending through the opening formed by the alined pipes; substantially as described.

11. The combination with a series of strainers, each comprising a hollow body portion with perforated sides, and a pipe extending through said body portion and projecting some distance each side thereof, spacing-rings *j* interposed between each of said strainers, spacing devices approximately at the centers of several strainers for supporting the same and permitting communication between the pipes and the space within the rings *j*, a clearing-blade extending through the opening formed by the alined pipes, said clearing-blade being in the form of a screw of less diameter

than the opening through the pipes, and means for forcing the material to be strained through said pipes independently of the action of said clearing-blade; substantially as described.

12. In a device of the character described, the combination with parallel supports, of strainers supported thereon consisting of hollow bodies opening to the exterior, and spacing-rings *j* interposed between said hollow bodies, pipes passing through said hollow bodies to admit material between said strainers and within the spacing-rings *j*, and a screw conveyer arranged in said pipe for forcing the material under pressure between said strainers; substantially as described.

13. In a device of the character described, the combination with suitable parallel tubes, of strainers supported thereon, rings *j* interposed between said strainers, solid heads

which cooperate with the end rings, short sections of pipes which pass through said strainers and open to the spaces within the rings *j*, a screw conveyer passing through the pipe-openings, means for driving said screw conveyer, a clamping-screw for cooperating with at least one of said heads for clamping the rings *j* and sieves together, a conduit-pipe, branches from said conduit-pipe, and means for connecting said branch pipes to one or more rings *j*, whereby said rings may be moved without disconnecting said branch pipes; substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 17th day of July, 1899.

JOHN J. MURPHY.

Witnesses:

V. H. TEUSCHER,
W. C. SNEED.