

No. 770,307.

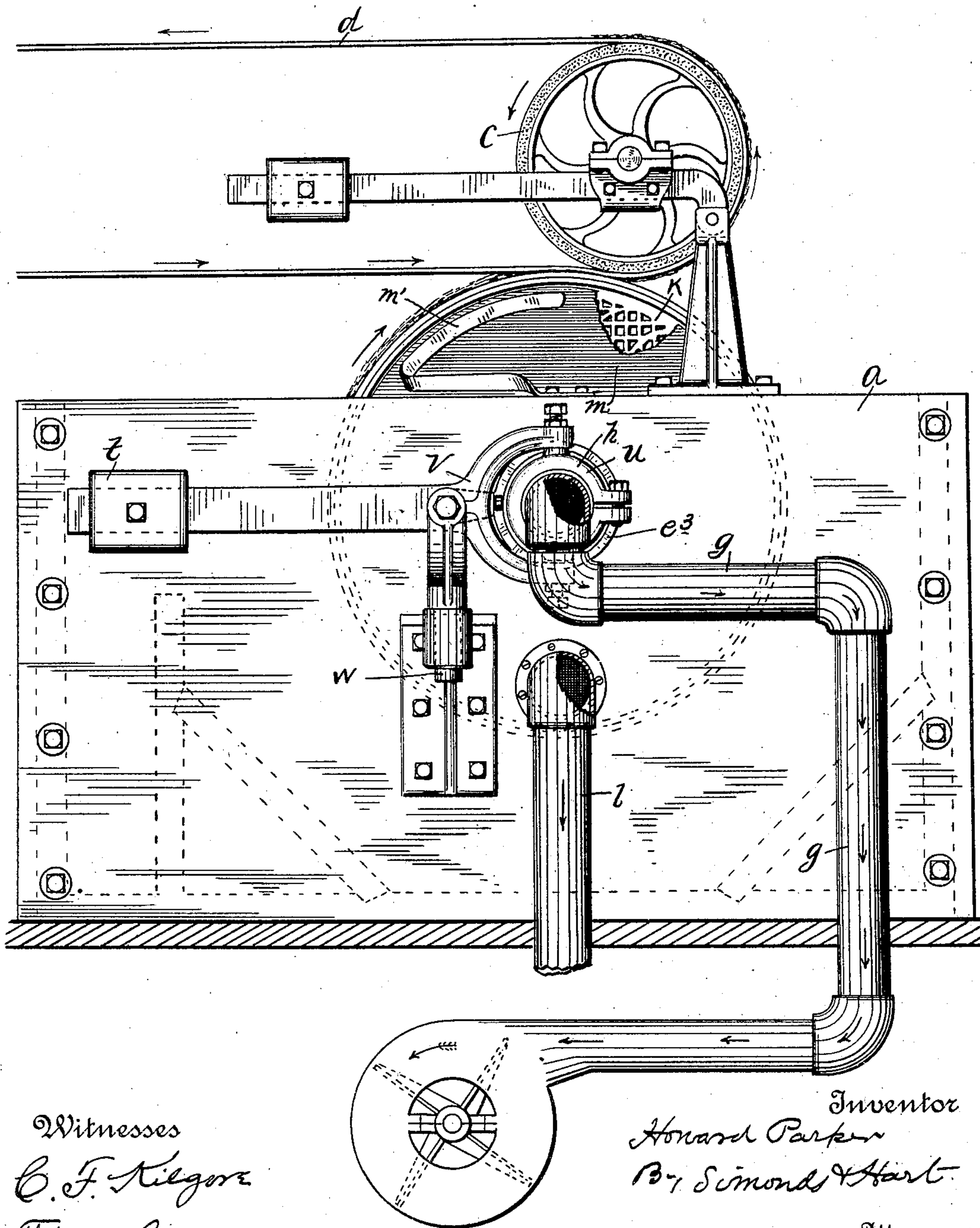
PATENTED SEPT. 20. 1904.

H. PARKER.
PULP TREATING MACHINE.
APPLICATION FILED MAR. 25, 1901.

NO MODEL.

6 SHEETS—SHEET 1.

Fig. 1



Witnesses
C. F. Kilgore
F. M. Bragg.

Inventor
Howard Parker
By Simonds & Hart.
Attorneys

No. 770,307.

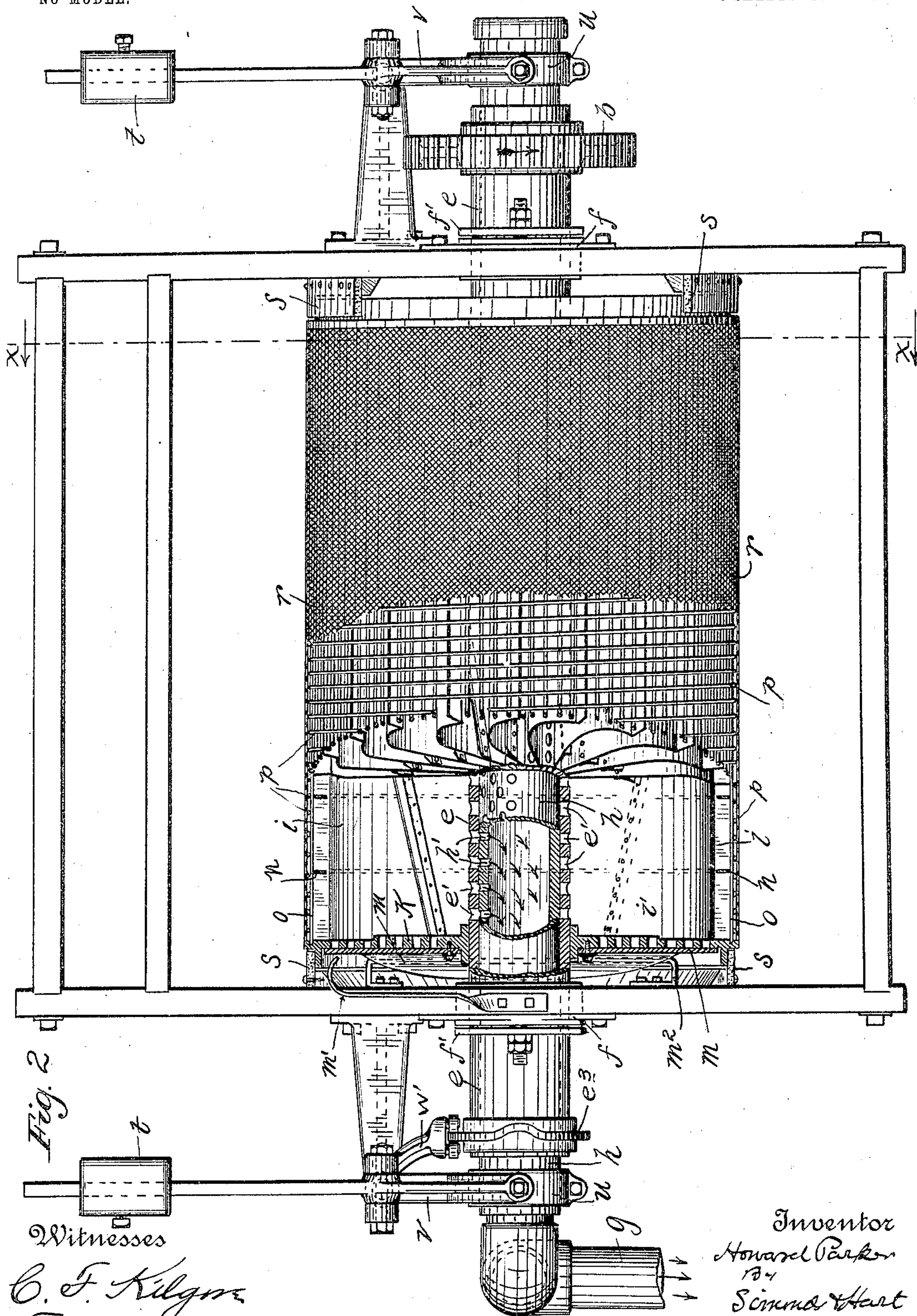
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6 SHEETS—SHEET 2.



Witnesses
C. F. Kilgore
F. M. Bragg.

Inventor
Howard Parker
By
Simms & Hart
Attorneys

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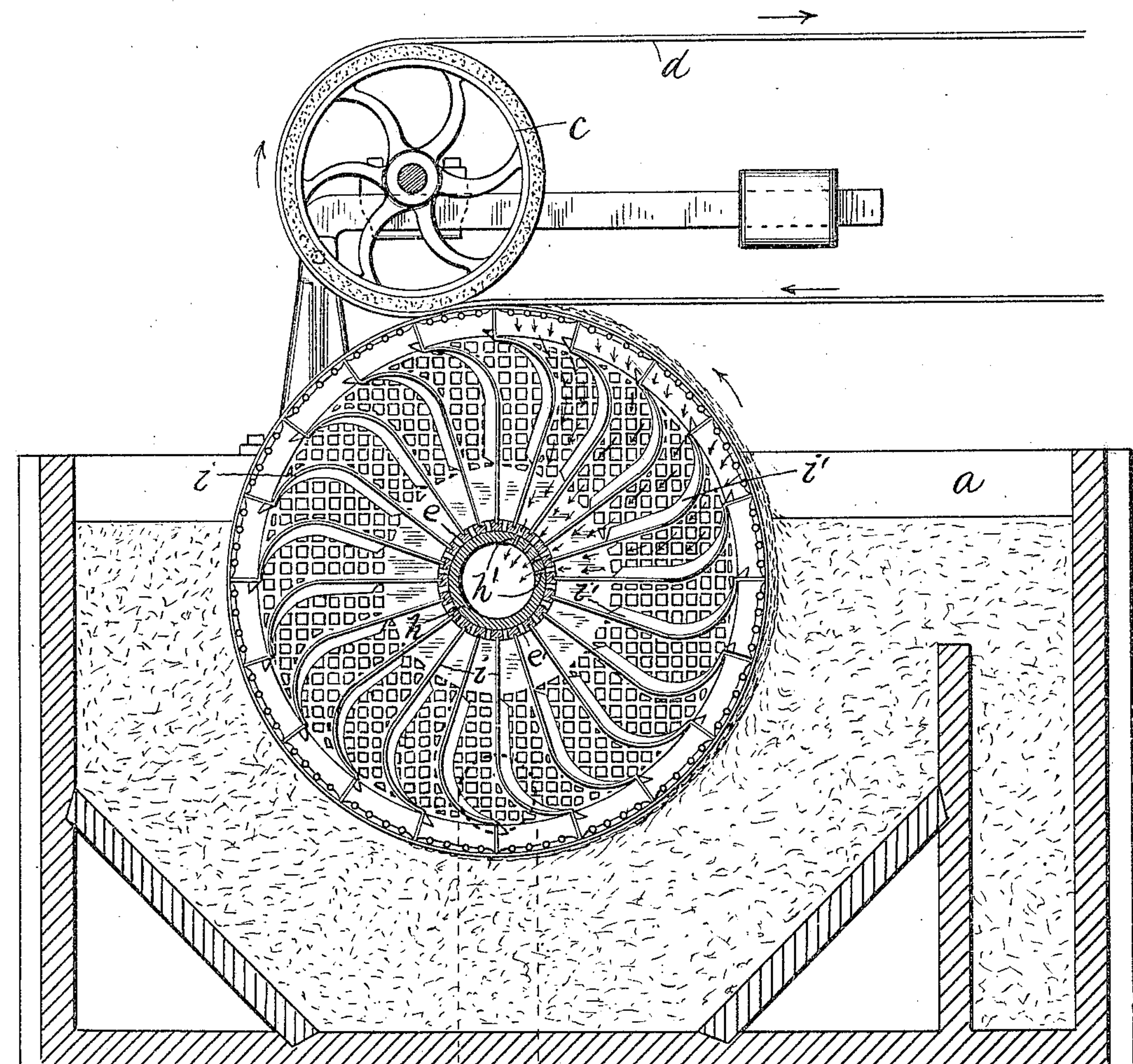
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6 SHEETS—SHEET 3.

Fig. 3.



Witnesses
C. F. Kilgore
F. M. Pragg.

Inventor
Howard Parker
By Simonds & Hart
Attorney

No. 770,307.

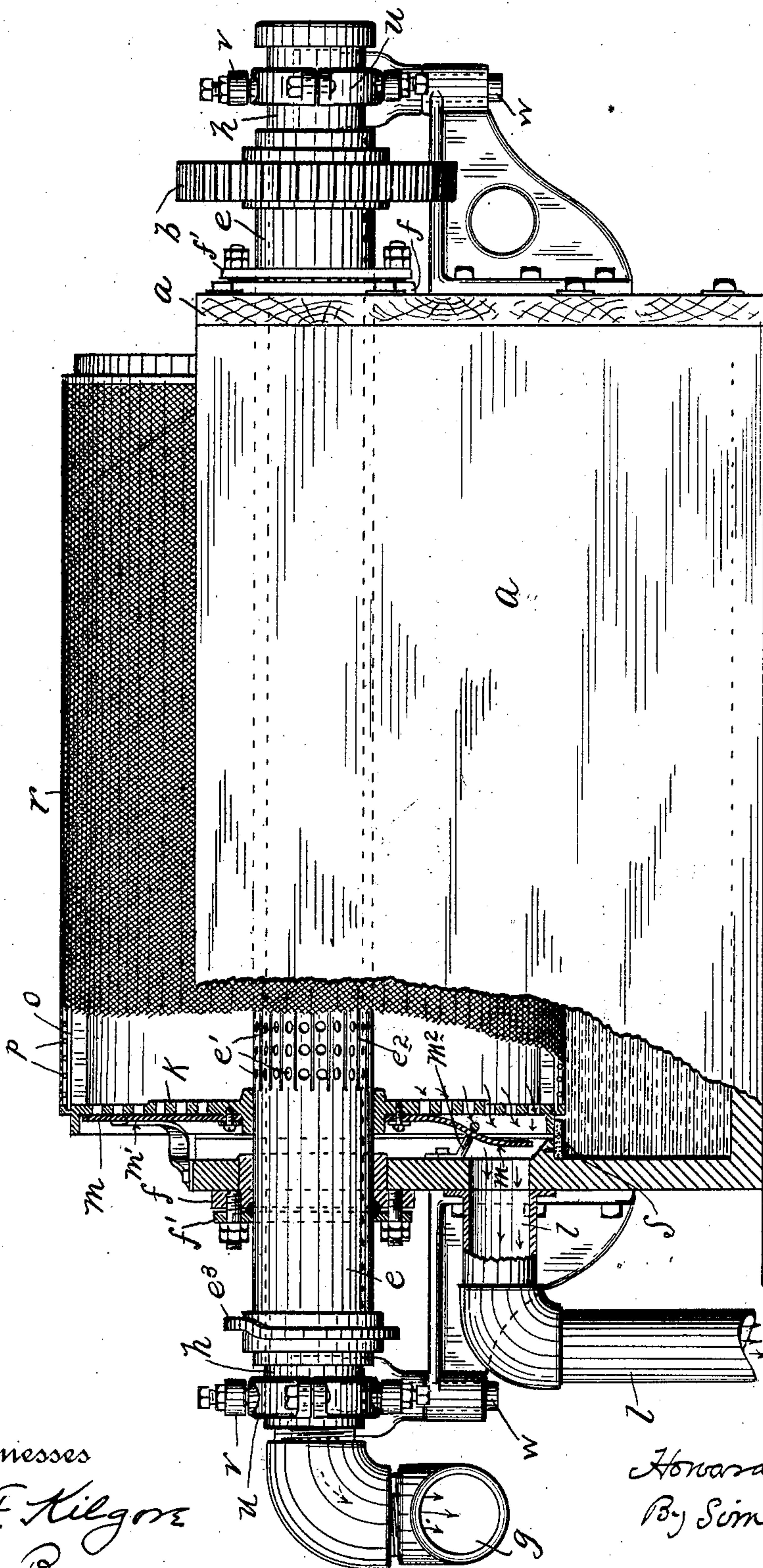
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6 SHEETS—SHEET 4.



Witnesses
C. F. Kilgore
F. M. Bragg.

2
Inventor
Howard Parker
By Simonds & Hart
Attorney

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6 SHEETS—SHEET 5.

Fig. 5

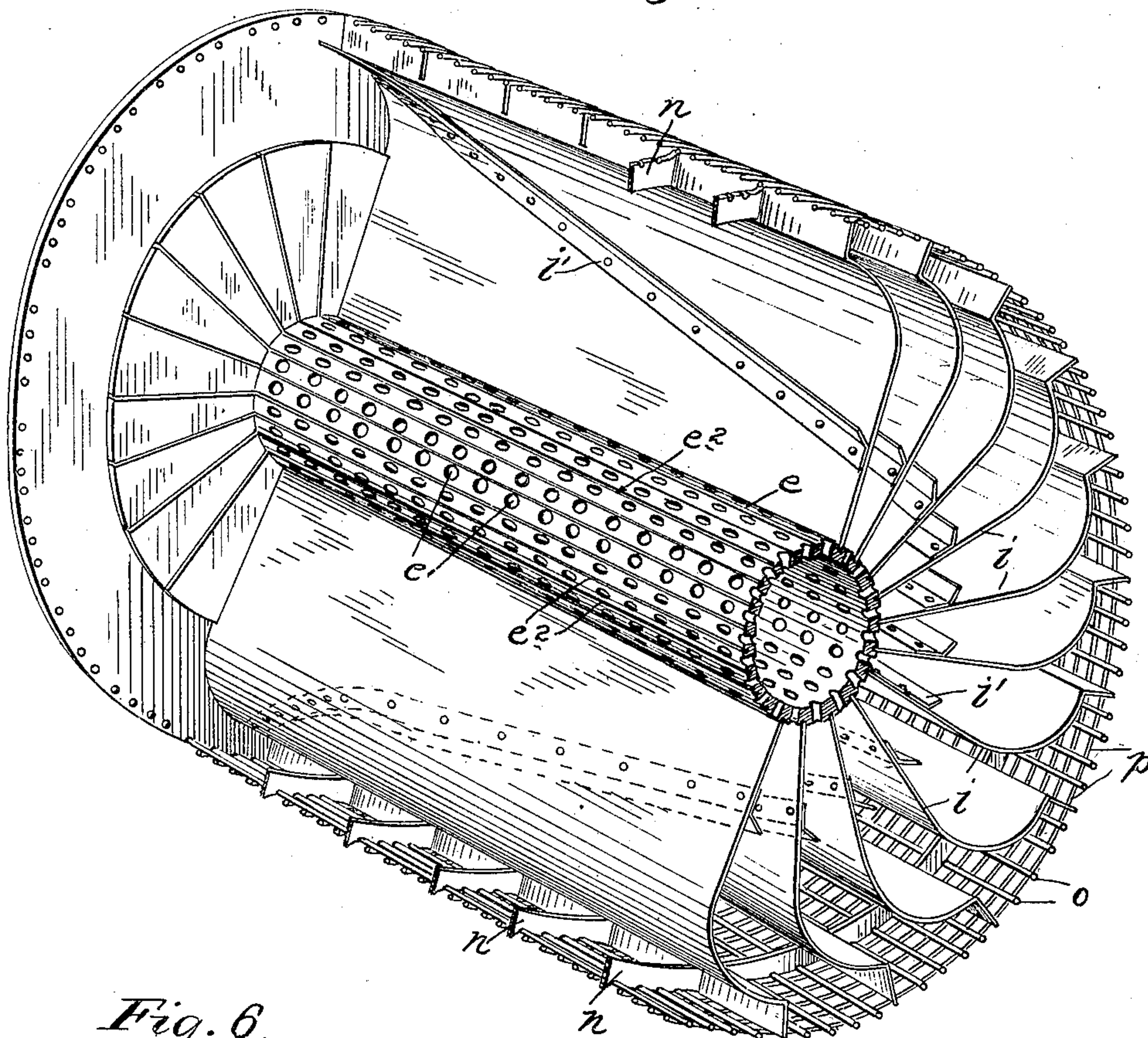
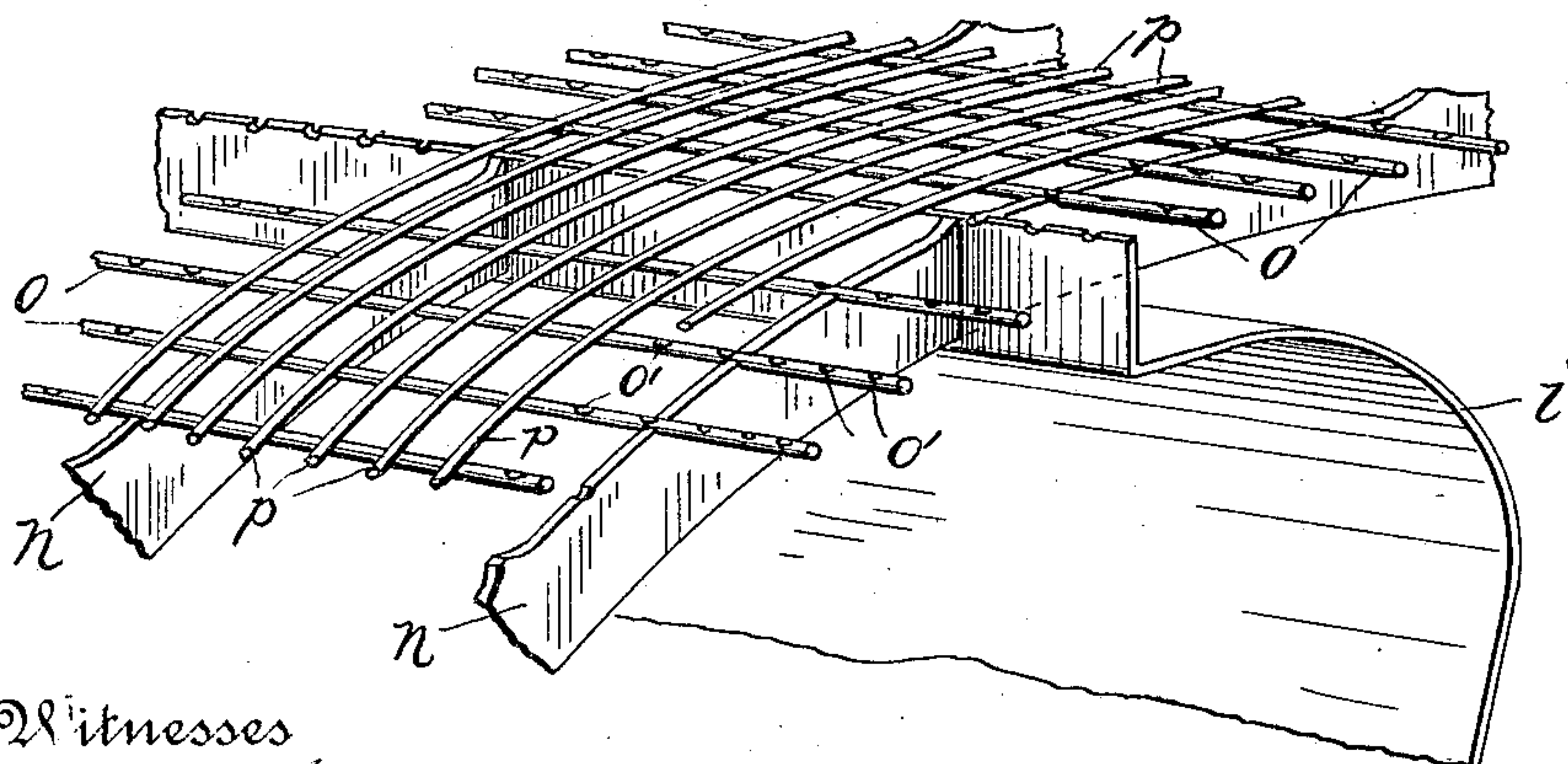


Fig. 6.



Witnesses
C. F. Kiegor
F. M. Dragg

Inventor
Howard Parker
By Simonds & Hart
Attorneys

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6 SHEETS—SHEET 6.

Fig. 7

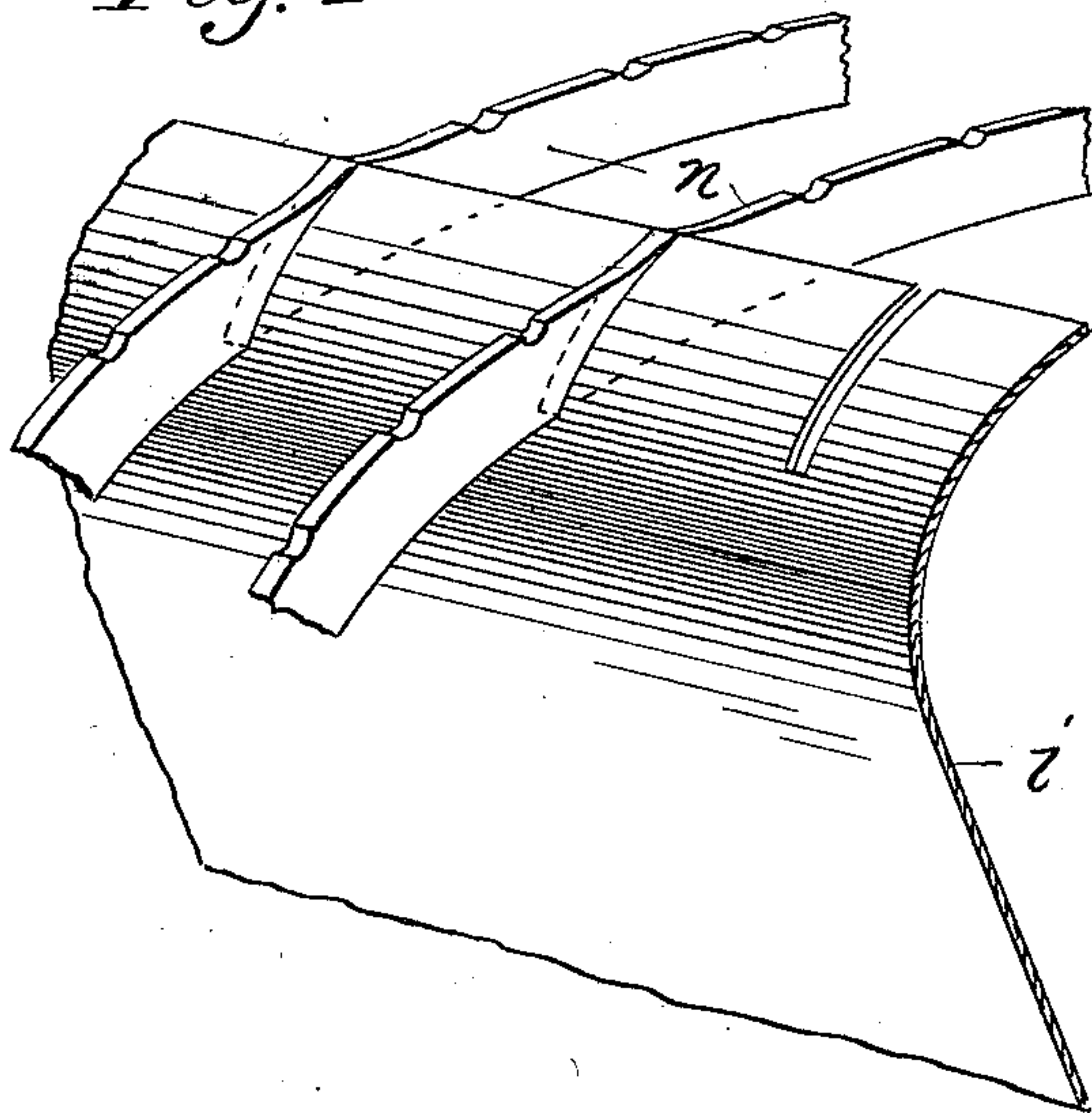
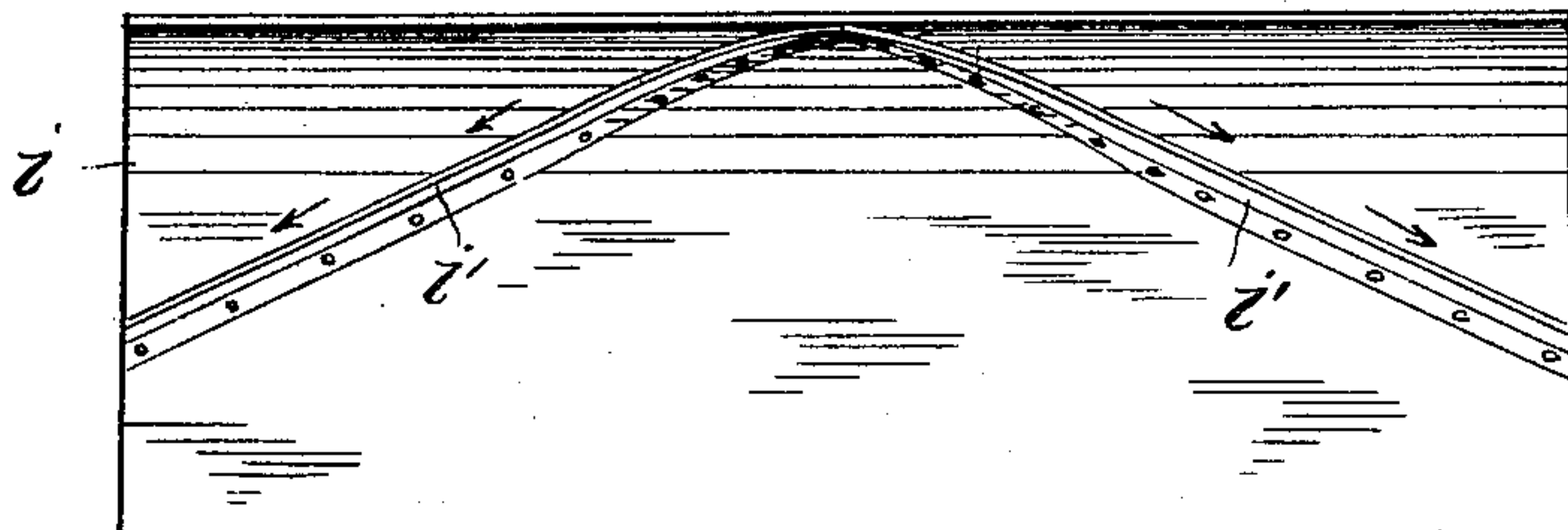


Fig. 8



Witnesses
G. F. Kilgore
F. M. Bragg.

Inventor
Howard Parker
By Simonds & Hart
Attorneys

UNITED STATES PATENT OFFICE.

HOWARD PARKER, OF BELLOWS FALLS, VERMONT.

PULP-TREATING MACHINE.

SPECIFICATION forming part of Letters Patent No. 770,307, dated September 20, 1904.

Application filed March 25, 1901. Serial No. 52,863. (No model.)

To all whom it may concern:

Be it known that I, HOWARD PARKER, a citizen of the United States of America, residing at Bellows Falls, in the county of Windham and State of Vermont, have invented a certain new and useful Improvement in Pulp-Treating Machines, of which the following is a specification, reference being had to the accompanying drawings, wherein—

Figure 1 is an end elevation view of an apparatus embodying said improvement. With reference to the view which is shown in Fig. 2, this is an elevation view at the left end. Fig. 2 is a plan view with some of the parts represented as broken away in order to expose interior construction. Fig. 3 is a view in sectional elevation on the plane denoted by the dotted line *xx* of Fig. 2 and looking in the direction indicated by the arrows overlying that dotted line. Fig. 4 is what may be termed a "front" elevation view. Some of the parts are represented as broken away. Fig. 5 is a detail view in perspective, on an enlarged scale, showing parts of the cylinder which revolve in the tank of pulp. Fig. 6 is a detail perspective view, on an enlarged scale, illustrating the construction of parts of the cylinder above referred to. Fig. 7 is a perspective view of a modified form of a part on an enlarged scale. Fig. 8 is a view of one of the wing-arms of the cylinder, showing a water-trough which sheds both ways. Those shown in the other figures shed only one way.

The object of the improvement is the production of a mechanism for treating paper-pulp, taking the pulp in its liquid form and forming it into a sheet, which may, if desired, be delivered directly upon the "felt" of a paper-making machine.

In the accompanying drawings the letter *a* denotes the pulp-tank, to which the pulp is supplied in any suitable manner. In this tank there revolves a cylinder having a perforated surface readily identified by the eye, which is rotated in some suitable manner, as by a gear meshing with the gear *b*, which is fixed on the same shaft with the cylinder. As the cylinder revolves in the pulp it takes a coating thereof upon its surface, which is pressed between the cylinder and the couch-

roll *c*, becoming thereby attached to the felt *d* and traveling on its surface to some proper destination, which may, if desired, be any proper part of a paper-making machine.

The cylinder-shaft *e* (to which gear *b* is fixedly attached) rotates in suitable bearings—as, for instance, in bearings *f*, carrying stuffing-boxes *f'*. This cylinder-shaft has perforations *e'*, which are primarily for permitting the working of a certain suction-draft. A proper mechanism for producing that suction-draft (see Fig. 1) is attached to the pipe *g*, which is in connection with a non-rotary pipe *h*, which is within the hollow shaft of the revoluble cylinder. In the upper part of the pipe *h* there are perforations *h'*, wherefore the suction-draft is confined to the upper part of the cylinder and is confined to that portion of the cylinder which in revolution precedes its contact with the felt *d*. This suction-draft draws the coating of pulp which is on the cylinder into regular and intimate contact therewith and to a substantial degree draws the water therefrom. That water passes through the perforated exterior part of the cylinder and into the interior thereof. There the troughs *i'*, which are on the wing-arms *i*, catch the water, conduct it to one end of the cylinder, when it is delivered through the perforated cylinder-head *k*, at the lower part thereof, whence it runs off through the pipe *l*. The water escapes thus from the cylinder at its lower part only, for it is necessary that the upper part be closed for the maintenance of the suction-draft already referred to. In order to bring that about, there is a flexible valve *m*, much like a gasket in shape and which may well be of rubber or rubber compound, which is attached by its central part to the perforated cylinder-head *k*, being loose therefrom elsewhere. It is held against the upper part of the cylinder for the maintenance of the suction-draft already mentioned by means of a spring *m'*, and it is kept from contact with the lower part of the perforated cylinder-head *k* by a guide *m''*, which may well be in the shape of a loop, as it is shown in the drawings.

At their inner ends the wing-arms *i* are inserted in grooves *e''*, which are cut in the pe-

riphery of the cylinder-shaft *e*. At the ends they are entered into radial grooves in the cylinder-heads, as well seen in Fig. 5. At the outer edges they are held in secure relation to each other by being secured to the rings *n*. These rings *n* carry the cross-bars *o*, which are entered at their ends into the cylinder-heads. On their outer surfaces the cross-bars *o* bear grooves or notches *o'* in a spiral relation to each other, and in them the wire *p* is laid spirally.

The letter *r* denotes a wire screen, such as cylinders for like purposes are often surfaced with, which is laid upon the exterior of the spiral wires *p* and forms the superficial part of the cylinder. The suction-draft through the upper part of the cylinder is constant, and its effects are as have already been described.

The letter *s* denotes a packing between the tank and the perforated cylinder-head. It is fastened to a parti-annular projection *S'* on the inside of the tank and presses against an annular flange projecting from the exterior of the perforated cylinder-head. Its purpose is to prevent the escape of the pulp into the chamber which received the water, which escapes through the perforated cylinder-head.

The pipe *h* is slightly smaller than the cylinder-shaft *e*, which incloses it. The pipe *h* is kept pressed against the upper interior part of the cylinder-shaft *e* by the counterweights *t*. The letter *u* denotes the bearings of the shaft *h*, which are pivotally hung to the levers *v*, (carrying the counterweights *t*), which are in turn pivotally hung to the rotatable shafts *w*. This is an arrangement which gives the shaft *h* and its bearings a freedom of movement in different directions which is consistent with keeping the shaft *h* pressed upward against the upper interior part of the cylinder shape *e*. Of course springs might be substituted for the counterweights. That freedom of motion is availed of to give the shaft *h* a short back-and-forth movement with every rotation of the cylinder primarily for the purpose of freeing the contact-surfaces of pipe *h* and cylinder-shaft *e* from grit and the like. One protruding end of the shaft *e* is provided with the cam-flange *e'*.

The letter *w'* denotes a cam-arm practically fast to a rotatable shaft *w*. This cam-arm takes hold of the cam-flange *e'*, and the coöperation of the two gives the pipe *h* the back-and-forth movement already referred to.

Fig. 7 is intended to illustrate the construction of the rings *n*. One of these rings may be made of one entire piece; but preferably it is made in two parts, and it is that construction which is illustrated in Fig. 7. In that construction two bars of rectangular shape in cross-section and of greater width than thickness are bent edgewise. Then by means of suitable milling or other machinery they are

given the appropriate and proper contour. The surface 1 2 3 is the surface of the ring before it is wrought into shape. The surface 3 4 shows the first cutting that is made, and the surface from 4 to 1 shows the complete contour and configuration. This method of construction produces a ring in which the grain of the metal is so disposed that the greatest strength is obtained with the least weight.

In Fig. 7 the shape of a wing-arm is shown modified in form as compared with the shape of the same member shown in other figures of the drawings.

In Fig. 8 the trough *z'* is shown as delivering at both ends of the wing-arm instead of wholly at one end, as in the other figures of drawings. In case this trough is thus made to deliver at two ends both of the cylinder-heads must be perforated and otherwise provided with means for the escape of the water.

I claim as my improvement—

1. The revoluble cylinder having a perforated surface, the hollow shaft perforated throughout the entire extent of its surface, and wing-arms from the shaft to the exterior and extending continuously for the length of the cylinder, in combination with the pipe within the shaft perforated in part only and connected to a suction draft device for extracting moisture from the material on the surface of the cylinder and means carried by said wing-arms for conducting from the interior of the cylinder the moisture thus extracted, all substantially as described and for the purposes set forth.

2. The combination with the revoluble cylinder having a perforated surface, the perforated hollow shaft, and the radial partitions, of a pipe perforated in part only and located within said hollow shaft, and means for maintaining said pipe in contact with said shaft, said pipe being connected with a suction draft device, substantially as described.

3. The combination with the revoluble cylinder having a perforated surface, the perforated hollow shaft, and the wing-arms, of a pipe perforated in part only and located within said shaft and means for maintaining said pipe in contact with said shaft, substantially as described.

4. In combination; the revoluble cylinder having perforated hollow shaft; the perforated pipe within said shaft; and a device for giving said pipe endwise reciprocation; all substantially as described and for the purposes set forth.

5. In combination; the revoluble cylinder having perforated shaft; the perforated pipe within said shaft; a device for keeping said pipe against said shaft with yielding pressure; and a device for giving said pipe endwise reciprocation; all substantially as described and for the purposes set forth.

6. In combination; the revoluble cylinder

having perforated surface, a perforated head, wing-arms and hollow perforated shaft; the pipe within said shaft perforated in part only; the flexible valve appurtenant to said perforated head; means for keeping said valve against said head at one place; and means for keeping said valve off said head at another place; all substantially as described and for the purposes set forth.

10 7. In combination; the revoluble cylinder having perforated surface, perforated head, wing-arms, and hollow shaft perforated in part only; a device for keeping said pipe against said shaft with yielding pressure; a
15 device for giving said pipe endwise reciprocation; the flexible valve appurtenant to said head; means for keeping said valve against said head at one place; and means for keeping said valve off said head at another place;
20 all substantially as described and for the purposes set forth.

8. The revoluble cylinder having perforated surface, wing - arms and perforated hollow shaft in combination with the slanting troughs
25 carried by said arms, all substantially as described and for the purposes set forth.

9. In combination, the revoluble cylinder having a perforated head and surface; the hollow perforated shaft; radial webs extending along said shaft forming compartments extending from end to end of said cylinder; a pipe perforated in part only and located within the hollow shaft, and connected to a suction device; an annular flange extending from the ends of said cylinder; the tank; and a part-
30 annular flange secured to the tank; and the packing between said two flanges, all substantially as described and for the purposes set forth.

10. A revoluble cylinder having partitions arranged interiorly thereof extending from shaft to shell, and troughs or conveyers carried by said partitions.

11. The combination with a revoluble cylinder, partitions arranged interiorly thereof
45 and having buckets formed at their outer edges, of troughs carried by said partitions.

HOWARD PARKER.

Witnesses:

BERTHA I. CAPRON,
CHARLES H. ROBB.