

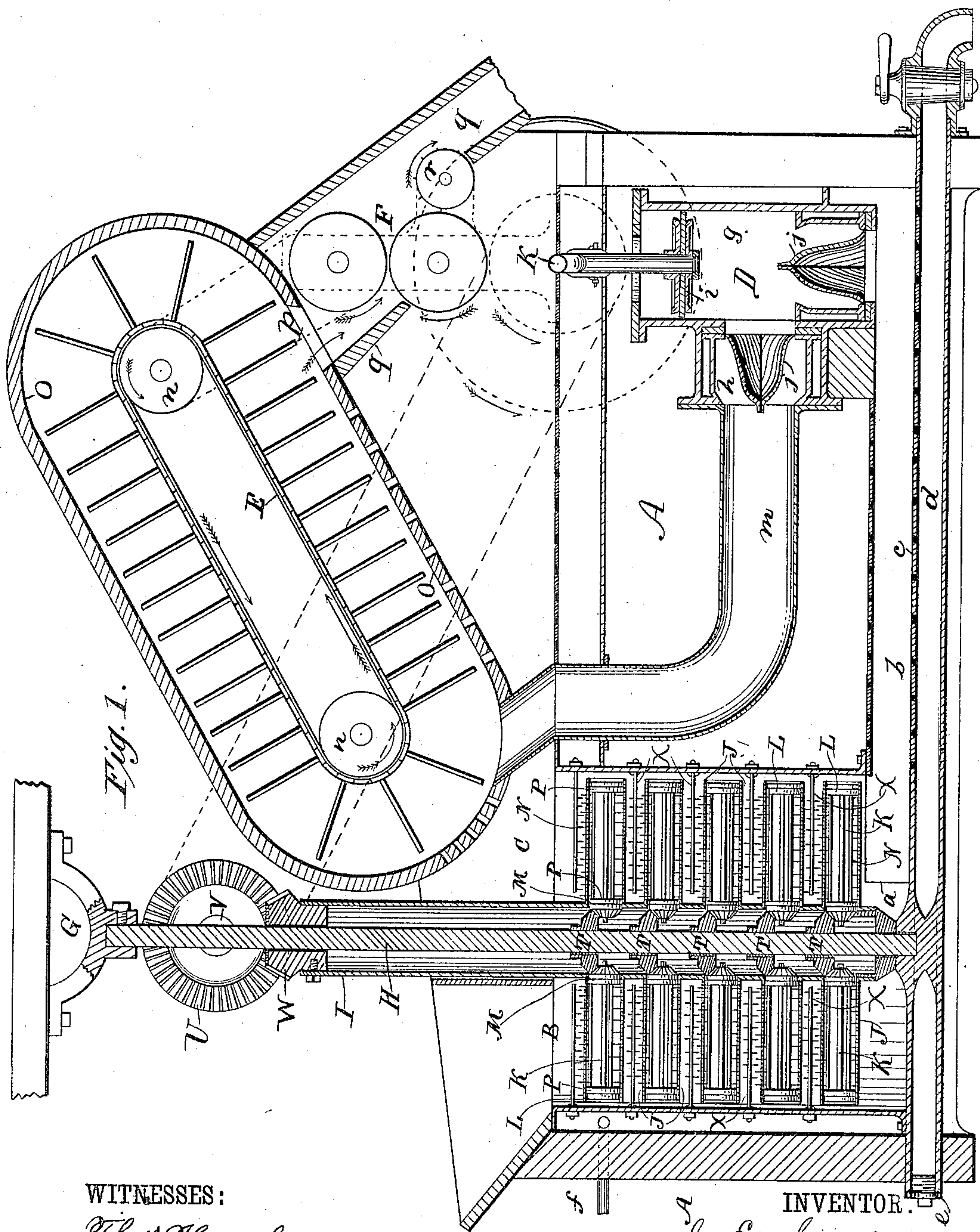
(No Model.)

6 Sheets—Sheet 1.

J. E. SINCLAIR.  
WOOL WASHING MACHINE.

No. 330,163.

Patented Nov. 10, 1885.



WITNESSES:

*Thos. Houghton.*  
*Edw. W. Ryan*

INVENTOR.

*J. E. Sinclair*  
BY *Munn & Co*

ATTORNEYS.



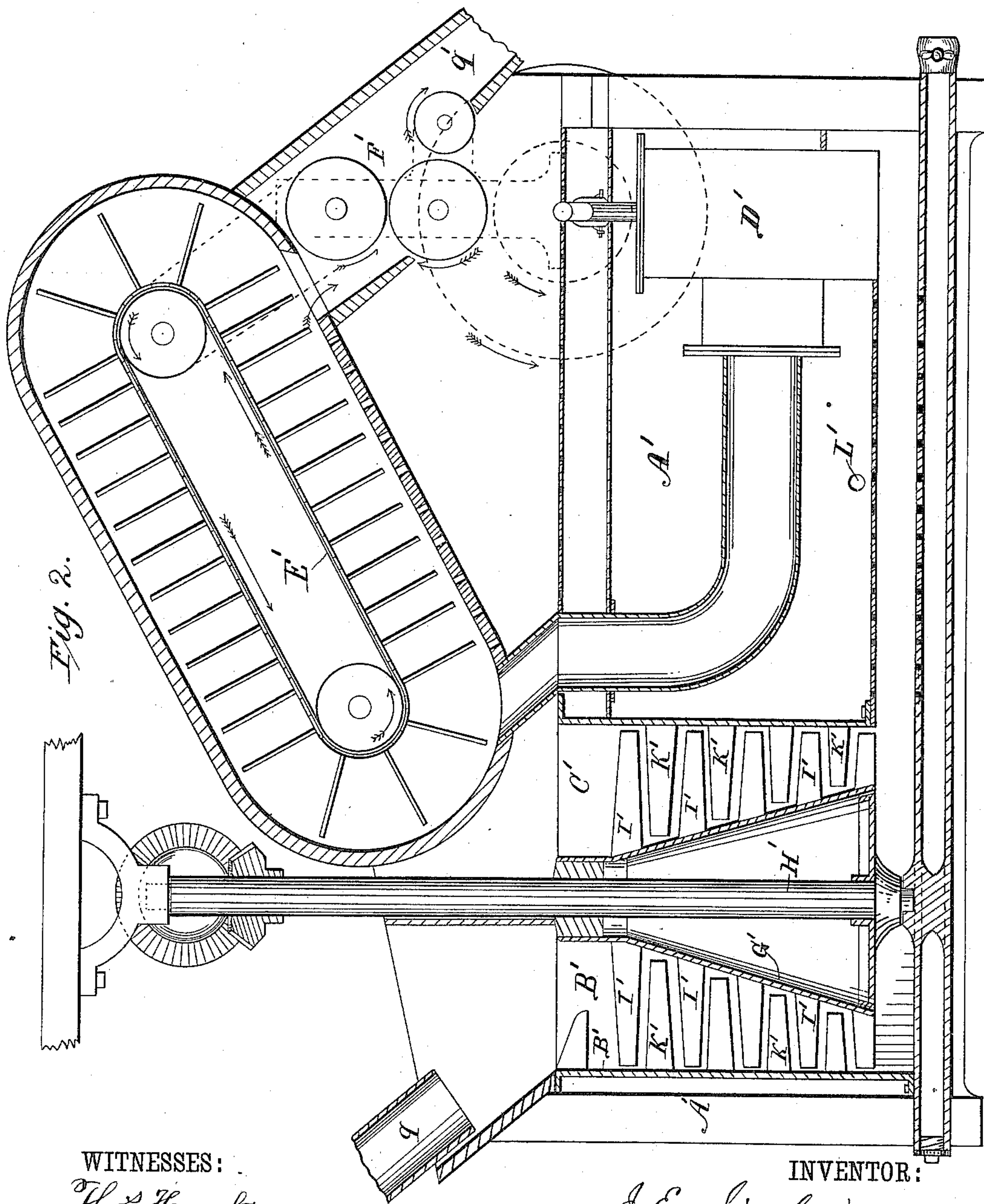
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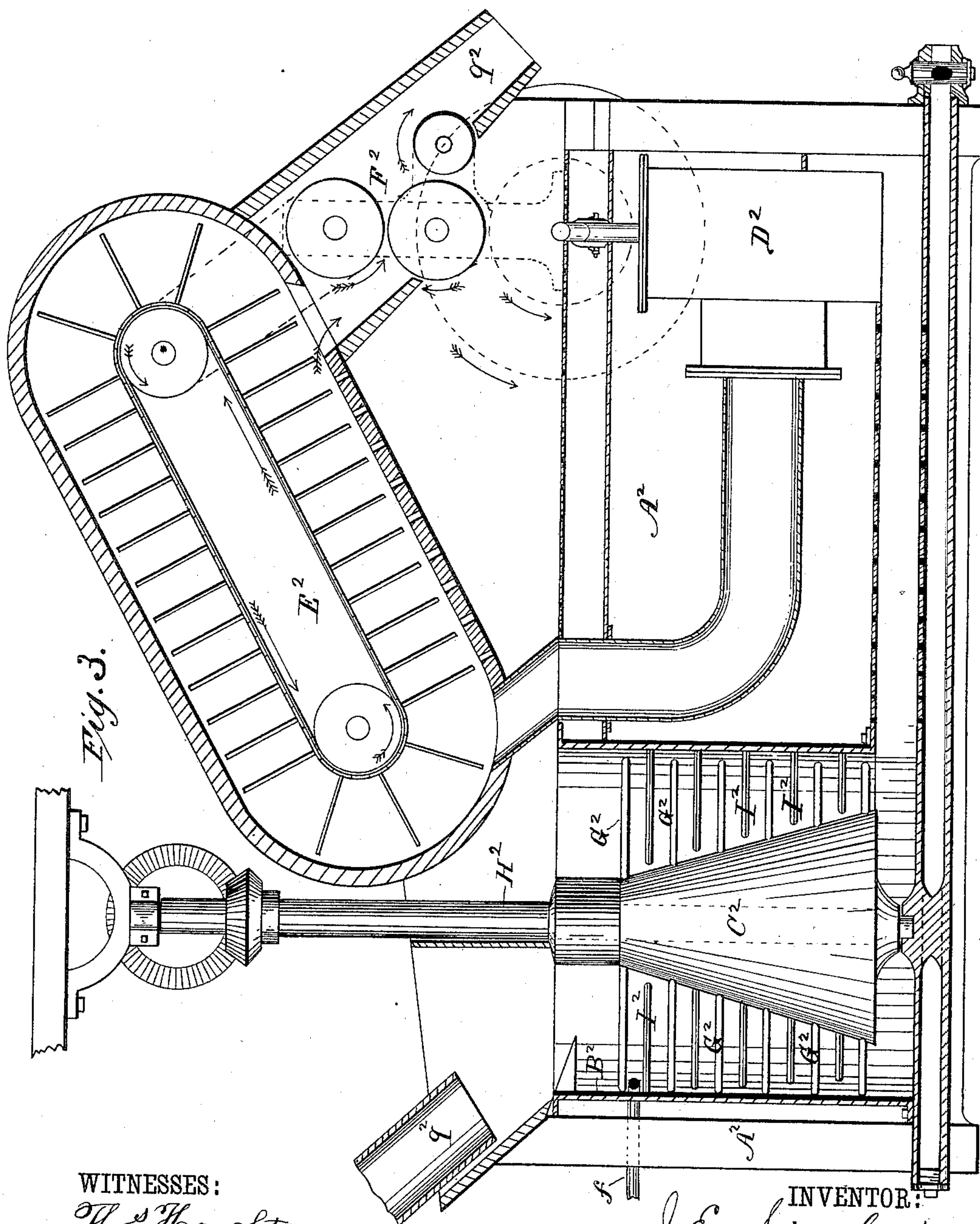
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Fig. 9.

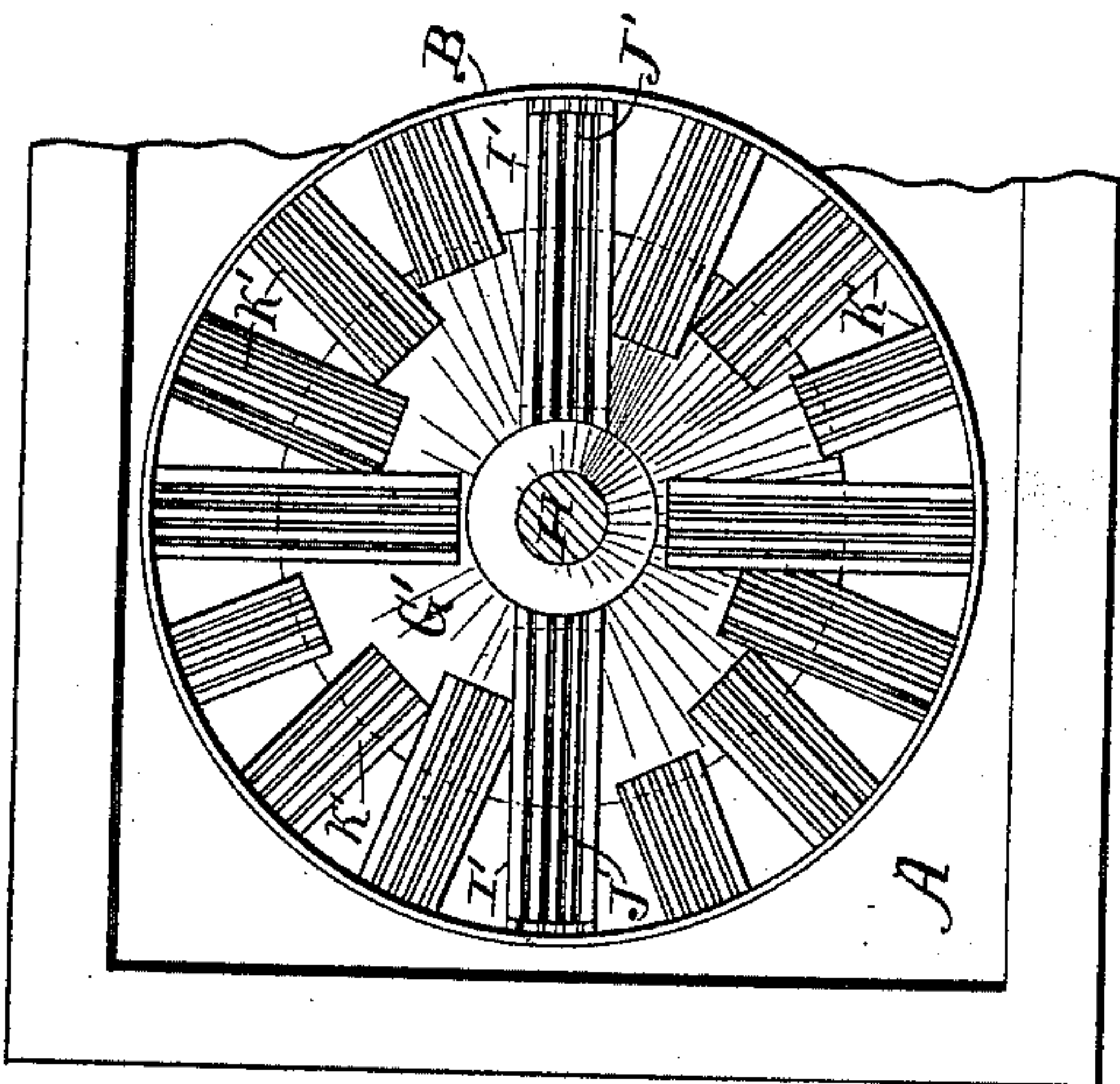


Fig. 4.

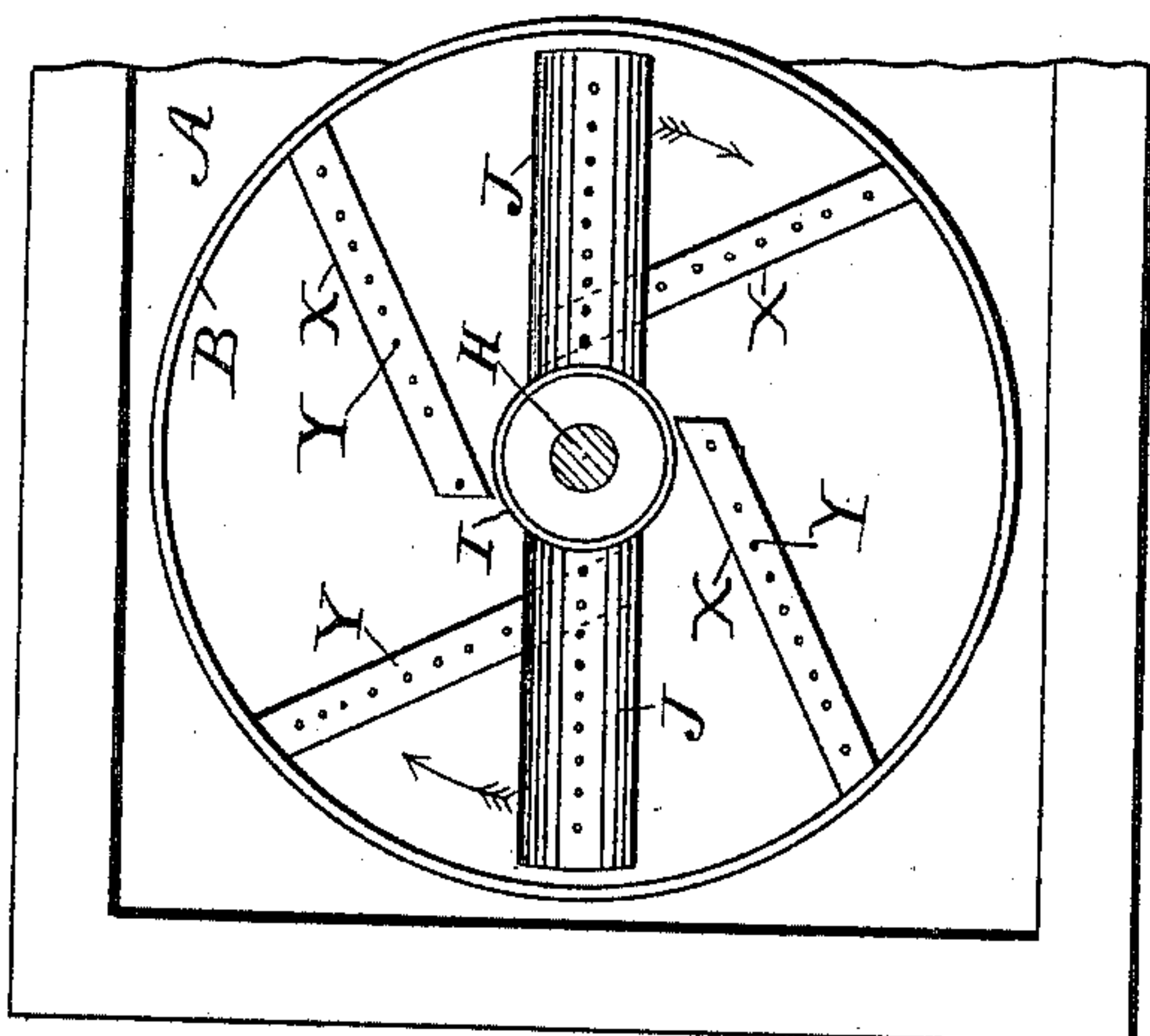
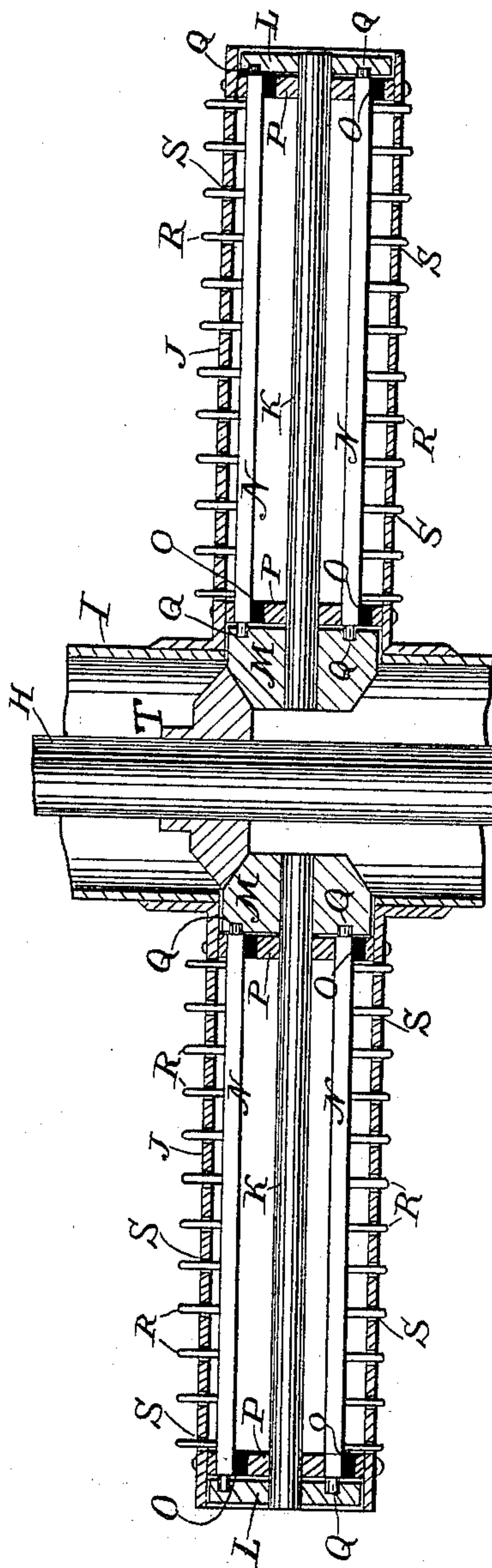


Fig. 5.



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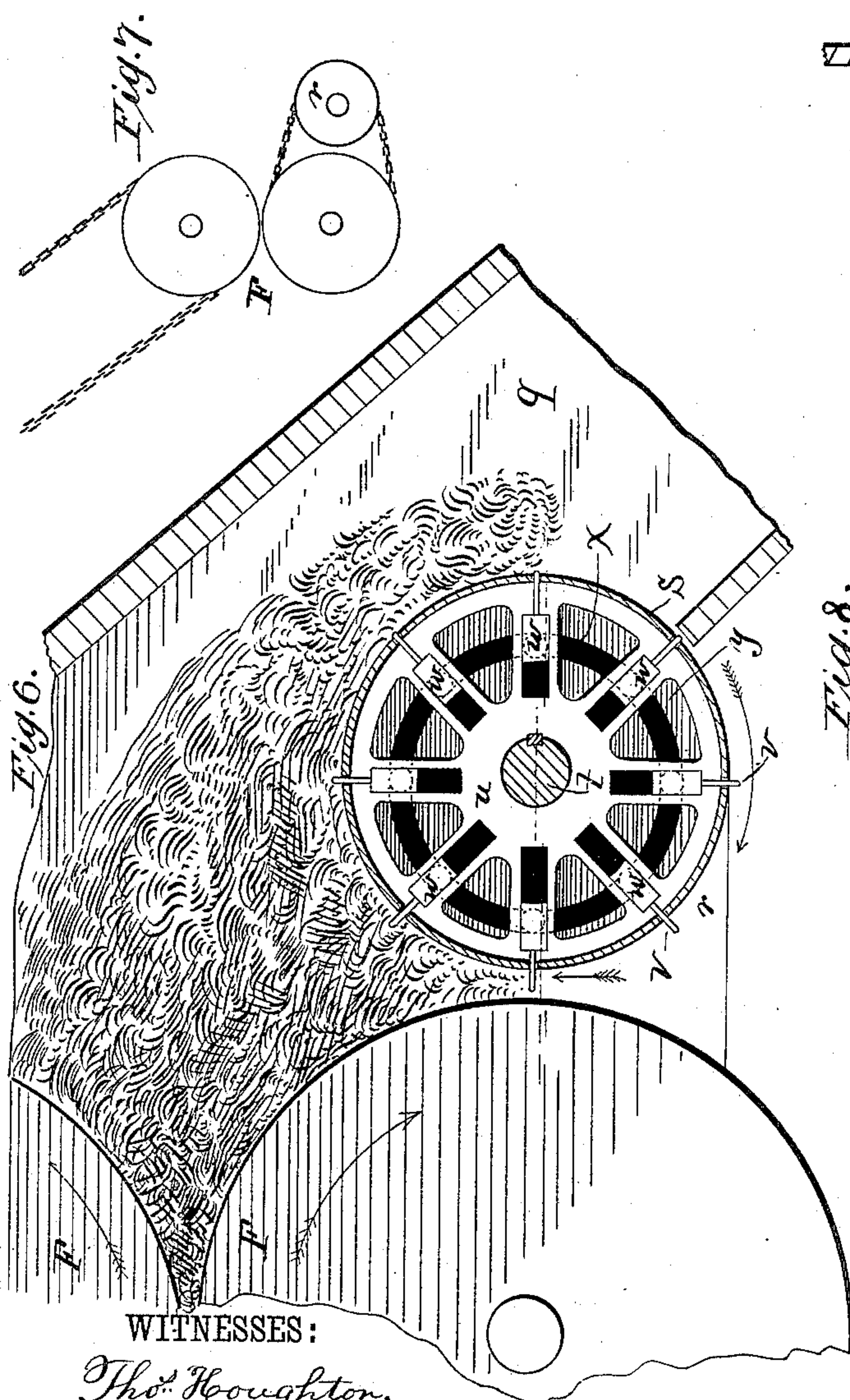
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J. E. SINCLAIR.  
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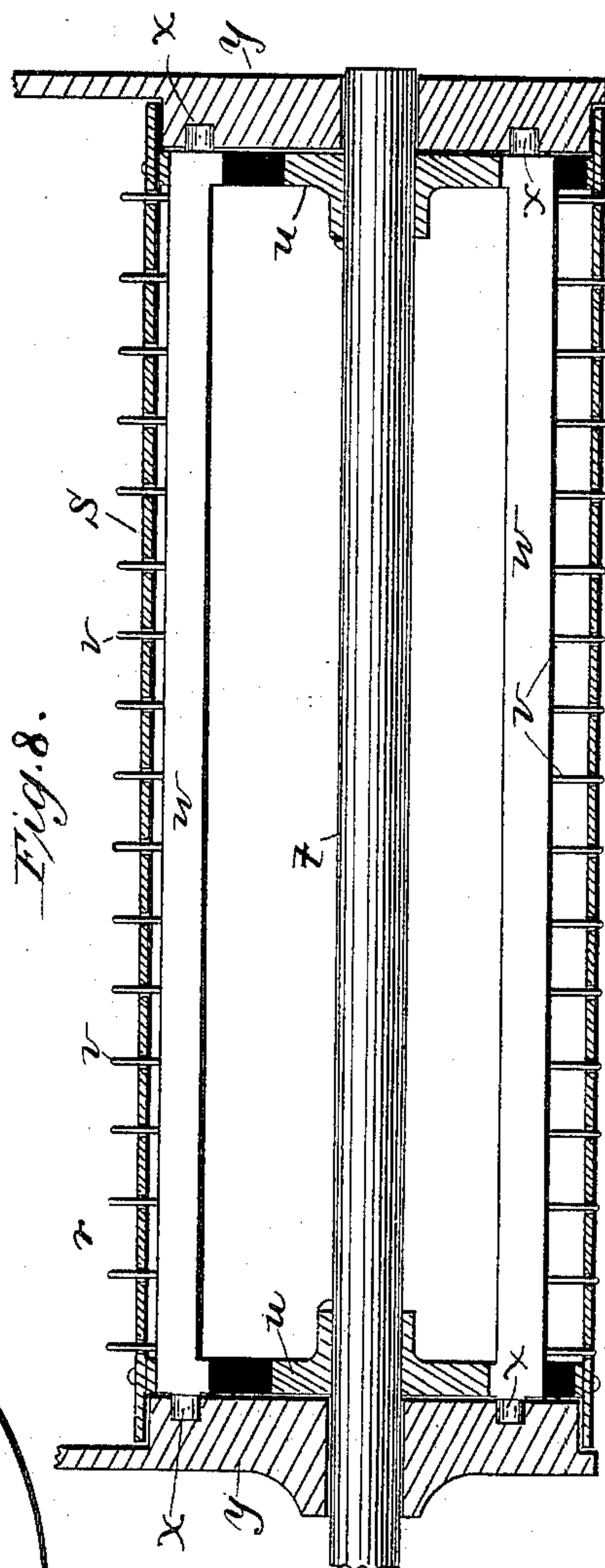
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(No Model.)

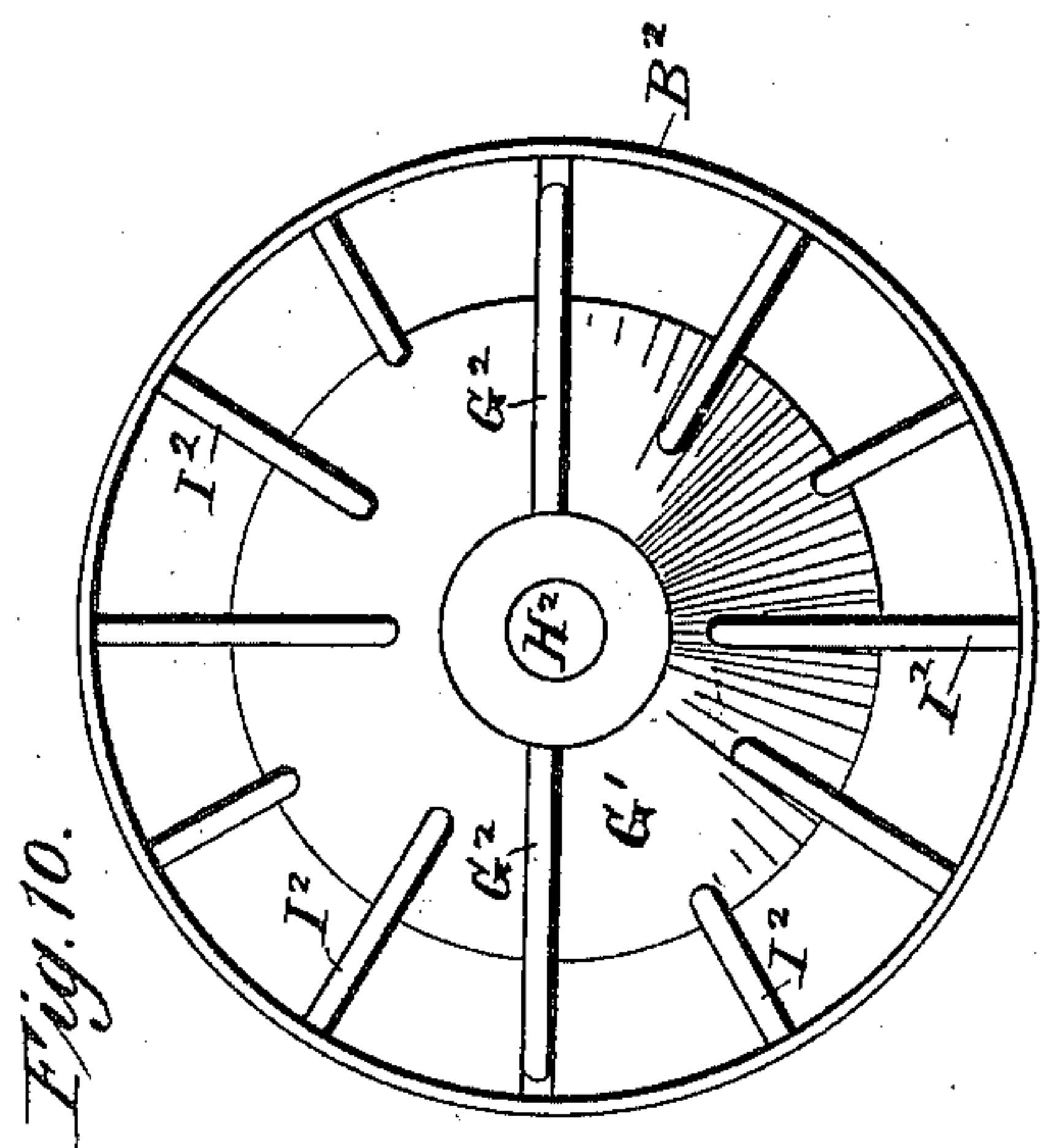
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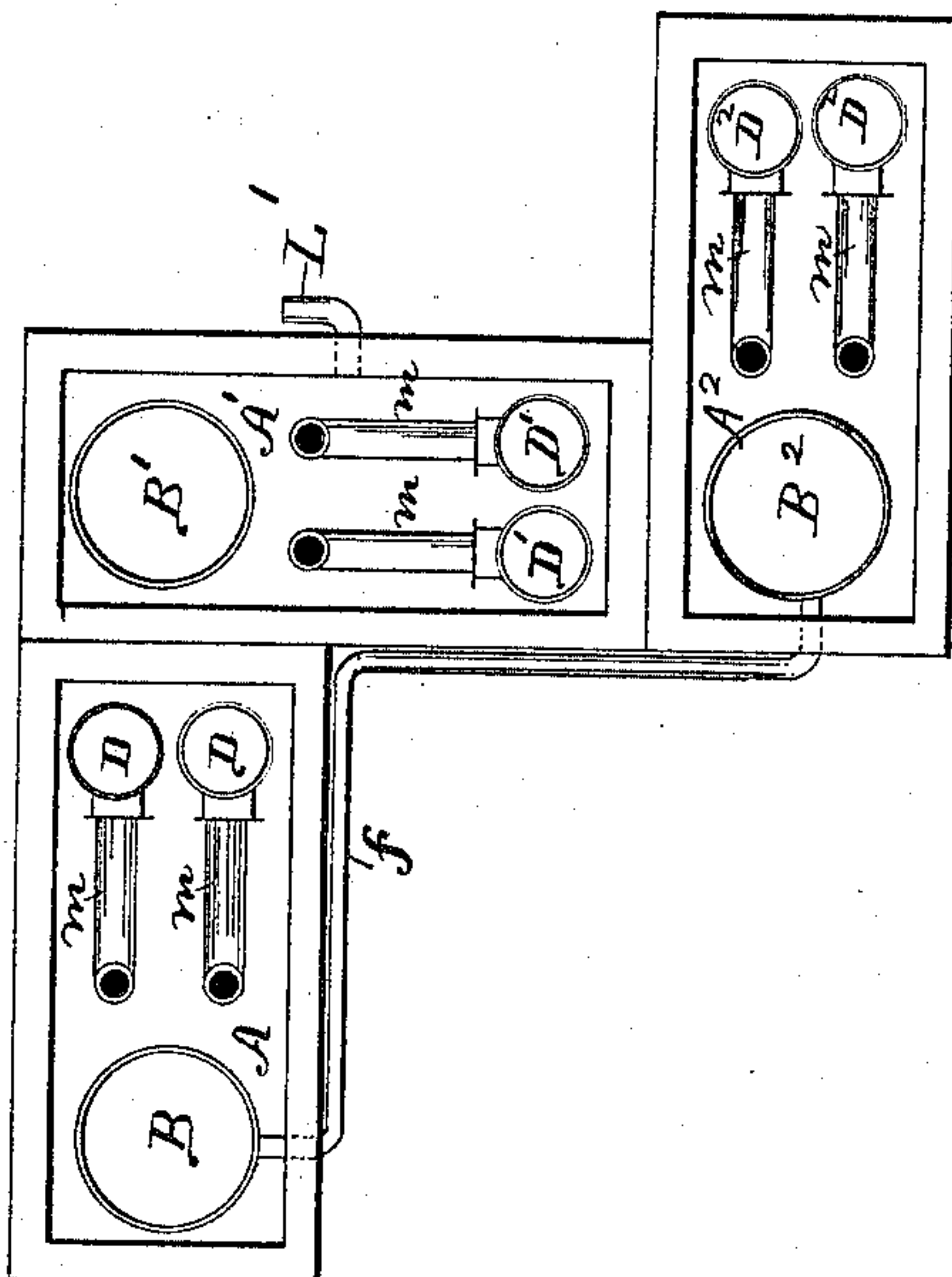
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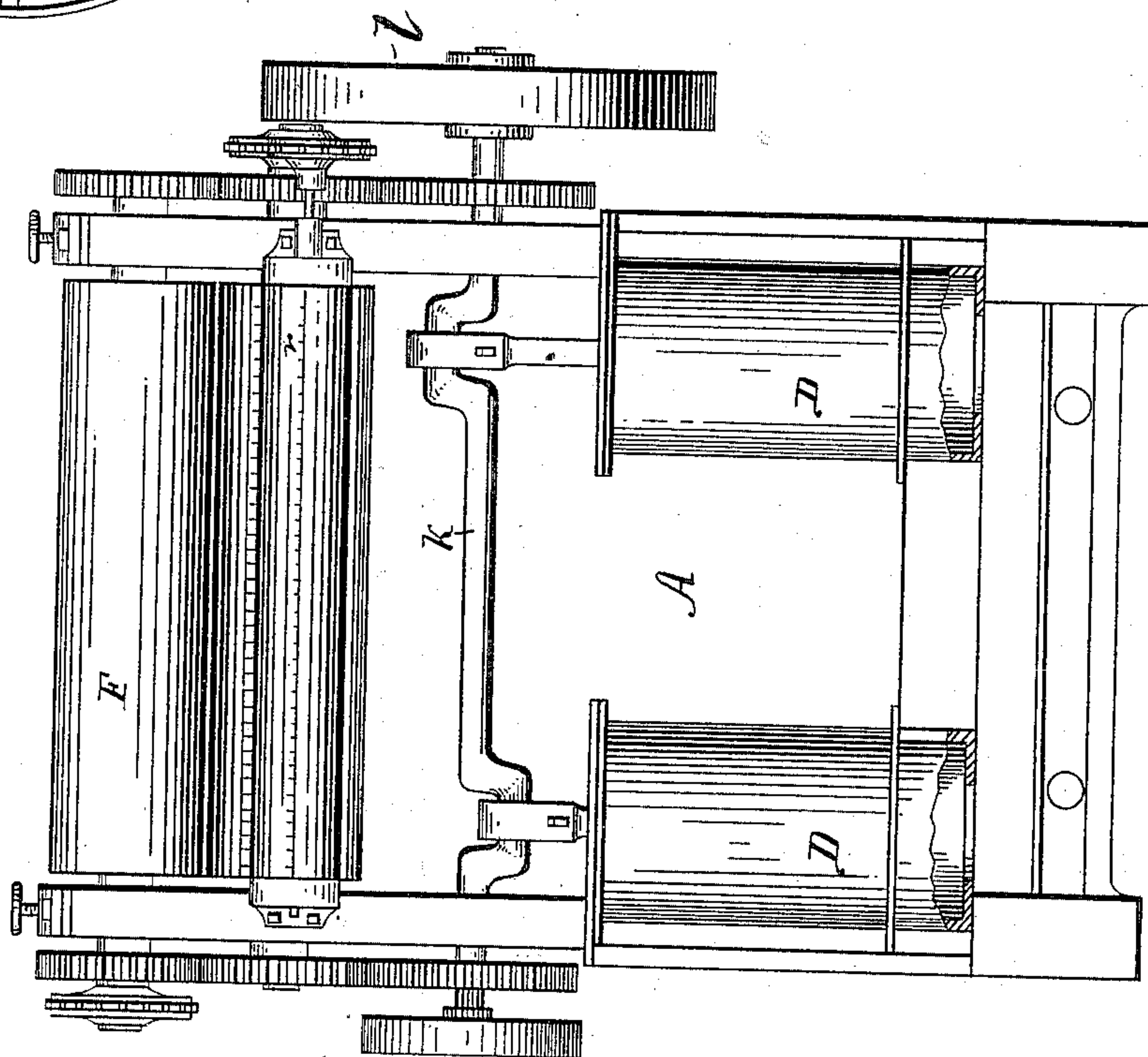
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*Fig. 12.*



*Fig. 11.*



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# UNITED STATES PATENT OFFICE.

JAMES E. SINCLAIR, OF WAVERLY, MARYLAND.

## WOOL-WASHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 330,163, dated November 10, 1885.

Application filed April 16, 1884. Serial No. 128,111. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES E. SINCLAIR, of Waverly, in the county of Baltimore and State of Maryland, have invented a new and useful  
5 Improvement in Machines for Washing and Cleaning Wool, Hair, or Similar Material, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, forming part of this specification.  
10

This invention relates to certain improvements on my machine for washing, scouring, and burring wool, described in Letters Patent No. 292,869, dated February 5, 1884. In said  
15 patent I have shown a machine for treating wool having a series of connected receptacles in which the wool is successively treated, and which receptacles are combined with one or more pumps for elevating the wool and water  
20 from one receptacle to another, and aprons and troughs for returning the elevated water to the receptacle from which it was drawn.

My present invention consists of certain improvements relating to the several parts of  
25 the machine, as hereinafter described and claimed.

In the drawings, Figure 1 is a central vertical section of one pump and the apparatus for washing the loose dirt and lime from the  
30 wool, on line *xx*, Fig. 12. Fig. 2 is a vertical section, at line *yy*, Fig. 12, of the receptacle and apparatus for scouring and cleansing the wool. Fig. 3 is a vertical section on line *zz*, Fig. 12, of the receptacle and apparatus for rinsing the  
35 wool. Fig. 4 is a plan view of the wool-separating device shown in Fig. 1. Fig. 5 is an enlarged detail view of the same in section. Fig. 6 is an enlarged detail view of the wringers and brush, the latter being in section. Fig.  
40 7 is a diagram showing the gearing of the same. Fig. 8 is a longitudinal section of the said brush. Fig. 9 is a plan view of the wool-rubbing device shown in Fig. 2. Fig. 10 is a plan view of the wool-stirring device shown  
45 in Fig. 3. Fig. 11 is an elevation of the wringers, brush, and pumps shown in Figs. 1, 2, and 3; and Fig. 12 is a diagram showing a convenient arrangement of the three principal parts of the machine.

50 The improved washing receptacle and apparatus consists of a box, A, containing at

one end a vertical cylinder or hopper, B, provided with a wool-separating device, C, the pump D in the opposite end of the box, the traveling rake E, arranged above the box, and  
55 the wringer F. In the center of the cylinder B, and supported in the bottom of the box and in a bearing, G, above the same, is a stationary vertical shaft, H, around which a vertical sleeve, I, having horizontal hollow cylindrical  
60 branches J, is adapted to rotate. In each of the branches J, of which there may be any desired number, is arranged a longitudinal shaft, K, having a roller, L, rigidly secured to its outer end, and a bevel gear-wheel, M, rigidly  
65 secured to its inner end, the said shaft being supported by and adapted to rotate within spiders P, secured to the branch or cylinder J. Between the roller and gear-wheel  
70 are placed two or more bars, N, supported loosely in radial slots O in the spiders P, and having their ends in engagement with eccentric grooves, Q, formed in opposite ends of the roller and gear-wheel in a well-known manner,  
75 so that as the latter revolve the said bars will be moved toward and from the shaft K, and the pins R, attached to the bars, will be made to project through holes S in the cylinder J and be drawn inward again in successive  
80 order. The shaft K receives its motion by means of the rotation of the sleeve I around the shaft H and the engagement of the gear-wheel M with a bevel gear-wheel, T, rigidly  
85 secured to shaft H, the sleeve I deriving its motion from a bevel-gear, U, mounted on a horizontal shaft, V, and meshing with a bevel-gear, W, secured in the upper end of the sleeve I, and forming a bearing for the sleeve against shaft H. The shaft V is to be  
90 driven by any convenient connection with the pump D, which is to be driven by a suitable motor.

The branches J of the sleeve I are arranged one above another and on opposite sides of the said sleeve, so that each gear-wheel T on  
95 shaft H shall mesh with two or more gear-wheels, M. Between the branch cylinders J are arranged bars X, which are rigidly secured to the inner surface of the cylinder B, and are provided with pins or teeth Y, which, from  
100 time to time, mesh with the pins R as the sleeve I revolves, and assist in separating the



fibers of the wool. The bars X of each horizontal plane are arranged approximately at right angles one to another, with their inner ends in, or nearly in, contact with the sleeve

5 I. It is designed that the bars X of one horizontal plane shall not be arranged directly under those of the next higher plane of bars, but be set out from under the same severally in something of a spiral order, to facilitate the passage of the wool down through the cylinder B. Instead of arranging the bars X in such spiral order, they may be arranged one directly under another, and the branches J of the sleeve I may be given such spiral order instead, the result being the same in both cases.

With the above construction, as the sleeve I and its branches J are made to revolve around the shaft H, the shafts K are made to revolve within the branches J, causing the wool to be carried down through the cylinder B to the bottom of box A. The cylinder B is cut away on one side at its bottom, to form an opening, *a*, by which it communicates with a horizontal passage, *b*, leading to the end of the box containing the pump D. This passage is formed with a perforated false bottom, *c*, leading to the drain *d*, which catches the dirt from the wool, and from which the dirt is removed by directing a stream of water through the drain by means of a hose inserted into the end *e* of the drain. The false bottom *c* is constructed of loose boards, which may be removed for the purpose of cleaning the passage *d*. The ends of the drain are to be normally closed by suitable cocks.

The box A is supplied with water by a pipe, *f*, which is to lead from the rinsing receptacle and apparatus, as in my former invention, for the purpose of economizing the water.

The pump D consists of a vertical cylinder, *g*, having a horizontal branch cylinder, *h*, the piston *i*, and the rubber valves *j*. These valves are formed of two rubber plates secured in slots formed in opposite sides of each cylinder, as described in my application, No. 106,166, filed September 11, 1883.

There are two pumps, D, arranged side by side in the box A, and having their piston-rods connected to the same crank-shaft *k*, which is provided with a band-wheel, *l*, by which it is to be connected to a suitable motor. The two cranks on the shaft *k*, which operate the pumps D, stand at a quarter of a circle apart relative to each other. From each pump the wool is forced through a pipe, *m*, leading up to the traveling rake E above the box A. The rake consists of a toothed belt, and is carried by drums *n*, supported in the inclined casing *o*, and driven by suitable connection with the wringer F.

The bottom of the casing *o*, which is perforated to allow the water to run back into the box, serves to support the wool against the action of the rake until the wool is carried to the upper and rear end of the casing to an opening, *p*. Through this opening the wool

falls into the chute *q*, and is guided between the two rollers of the wringer F.

To prevent the wool from being carried around with the rollers by adhering thereto, one or more brushes, *r*, or equivalents may be used. The brush *r* is preferably formed of a hollow cylinder, *s*, mounted on a shaft, *t*, by means of spiders *u*, and having perforations through which work teeth *v*, attached to bars *w*, which are arranged to slide in radial slots formed in the spiders, and which have their ends set in eccentric grooves *x*, formed in stationary heads *y*, in which the shaft *t* is supported. With this construction the teeth will be made to project from the cylinder and be drawn inward in successive order.

The brush is preferably so arranged that the teeth will project from the cylinder as they pass the lower roller, so that they will catch the wool as it comes from the wringer, and as the brush continues to rotate the teeth are gradually drawn inward to disengage them from the wool and allow the latter to drop down the chute *q* into the second receptacle and apparatus. (Shown in Fig. 2.)

The scouring and cleansing receptacle and apparatus shown in Fig. 2 comprises a box, A', cylinder B', pump D', traveling rake E', and wringer F', similar in all respects to those above described. The wool-rubbing device C' is arranged in the cylinder B' and comprises a conoidal drum, G', secured to a vertical shaft, H', which drum is provided with radial arms I', having longitudinal corrugations J' therein, and the radial arms K', secured to the inner surface of the cylinder B'. The arms K' are likewise corrugated, as shown in Fig. 9, and are so arranged that those of one horizontal plane shall not be directly under those of the next higher plane of arms, but set out in something of a spiral order, forming gradually-descending passages from one plane of the arms to another.

The box A' is to be partially filled with any suitable cleansing solution for taking the animal-grease out of the wool, and this solution is to be heated by means of a steam-pipe, L', or other suitable device entering the box. The wool when sufficiently acted upon by the cleansing solution and the rubbing device is pumped up out of the box, the pumping causing the necessary circulation of the solution, and is carried through the wringer F' and down the chute *q'* into the rinsing receptacle and apparatus shown in Fig. 3.

The rinsing receptacle and apparatus shown in Fig. 3 comprises a box, A<sup>2</sup>, a cylinder, B<sup>2</sup>, pump D<sup>2</sup>, traveling rake E<sup>2</sup>, and wringer F<sup>2</sup>, similar in all respects to those above described. In the cylinder B<sup>2</sup> is arranged a conoidal drum, C<sup>2</sup>, having smooth stirring-arms G<sup>2</sup> secured thereto. The drum is secured to a shaft, H<sup>2</sup>, which is to be rotated by suitable mechanism. To the inner surface of the cylinder B<sup>2</sup> are secured arms I<sup>2</sup>, arranged substantially in the manner of the arms K' above described. The box A<sup>2</sup> is supplied with fresh water in



any suitable manner, as by a hose, and is provided with an overflow-pipe, *f*, leading to the box A, above described. The passage of the wool through the box A<sup>2</sup> is precisely the same as through the boxes A A', and it is discharged through the chute *q*<sup>2</sup> into any suitable receptacle in condition for being dried and carded.

Fig. 12 is a diagram showing a convenient arrangement of the three boxes A A' A<sup>2</sup>. Instead of this arrangement the box A<sup>2</sup> may be arranged in the angle formed by boxes A and A' with each other.

As the washing in box A is chiefly for removing lime, &c., from the wool before it is put into the box A', containing the grease-removing solution, said box or apparatus A may in some instances be dispensed with where there is no lime or other substance in the wool that would counteract the effects of the grease-removing solution.

What I claim is—

1. The combination of the vertical cylinder B, the stationary shaft H, having beveled gears T, rigidly secured thereon, the vertical sleeve I, journaled around the said shaft, and having horizontal hollow cylindrical arms J, the rotary devices arranged within the said arms and geared with said gears T, and the radially-sliding toothed bars N and the toothed bars X, secured to the inner surface of the cylinder and arranged in spiral order, substantially as shown and described.

2. The combination of the fixed vertical shaft H, the beveled gears T, secured thereon, the sleeve I, journaled upon the said shaft, the hollow cylindrical arms J, fixed radially upon the sleeve, the radially-slotted spiders P, fixed within the said arms, the bars N, provided with teeth adapted to protrude through the said arms and fitted in the spider-slots, the

shaft K, journaled centrally in the said arms, the roller L on one end of shaft K, and the gear M on the other end of the shaft provided with eccentric grooves, the wheels M and T, geared together, and the bars N, engaging the said eccentric grooves, substantially as shown and described.

3. The combination of the box A, perforated through its top, the pumps D, located in the box, the pipes *m*, leading from the pumps up out of the box, the toothed belt-rake E, mounted above the box A, and the casing O, mounted on an incline above the box around the rake and perforated through its bottom, and provided with an outlet, *p*, at the upper end of its inclined bottom, substantially as shown and described, whereby the wool may be raised to the wringer and be partially drained in its passage, and the drainage may return to the box, for the purpose specified.

4. The combination, in a machine for treating wool, of a vertical cylinder, B, a vertical hollow shaft or sleeve centrally journaled therein, cylindrical radial arms fixed upon the said sleeve, a series of teeth, and mechanism, substantially as described, for alternately protruding said series of teeth through the arms, and a series of toothed bars fixed to project radially inward from the shell of the cylinder, the said bars being arranged around within the cylinder spirally relative to each other, substantially as set forth, whereby the wool will alternately gather upon and be released from the circumference of the radial arms and will be gradually worked from the top to the bottom end of the cylinder, as set forth.

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Witnesses:

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WILLIAM H. BERRY.