

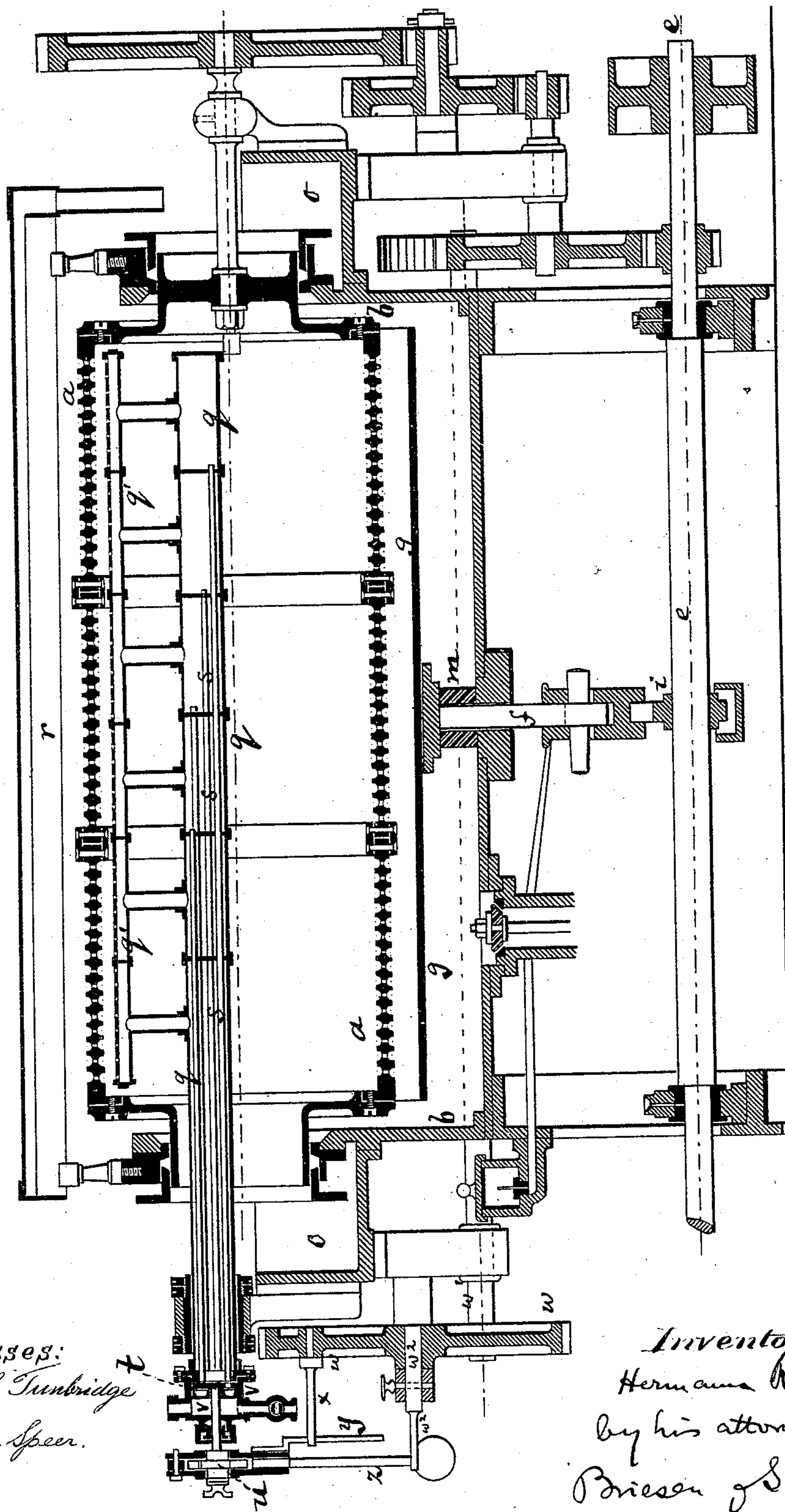
(No Model.)

3 Sheets—Sheet 1

H. REINICKE.
PULP STRAINER.

No. 287,164.

Patented Oct. 23, 1883.



Witnesses:
John C. Turnbridge
John M. Speer.

Inventor:
Hermann Reinicke
by his attorneys
Briesen & Seel

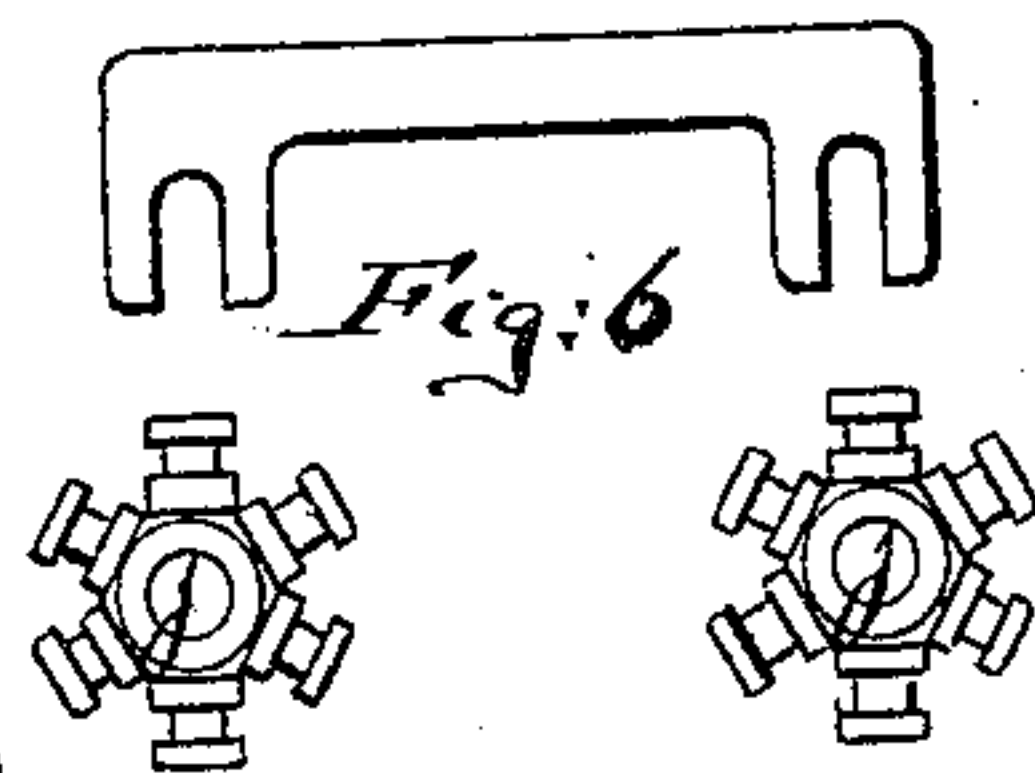
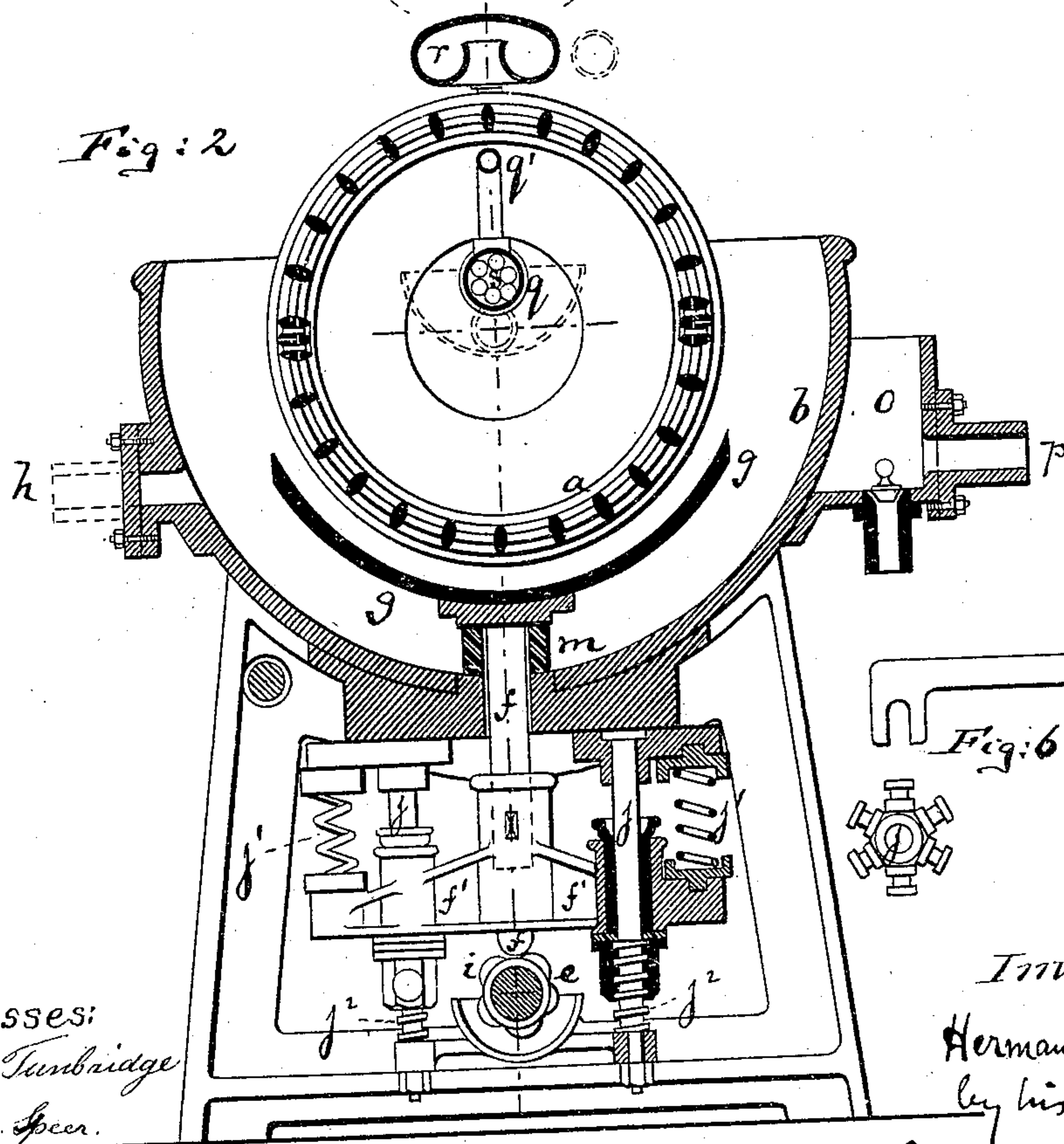
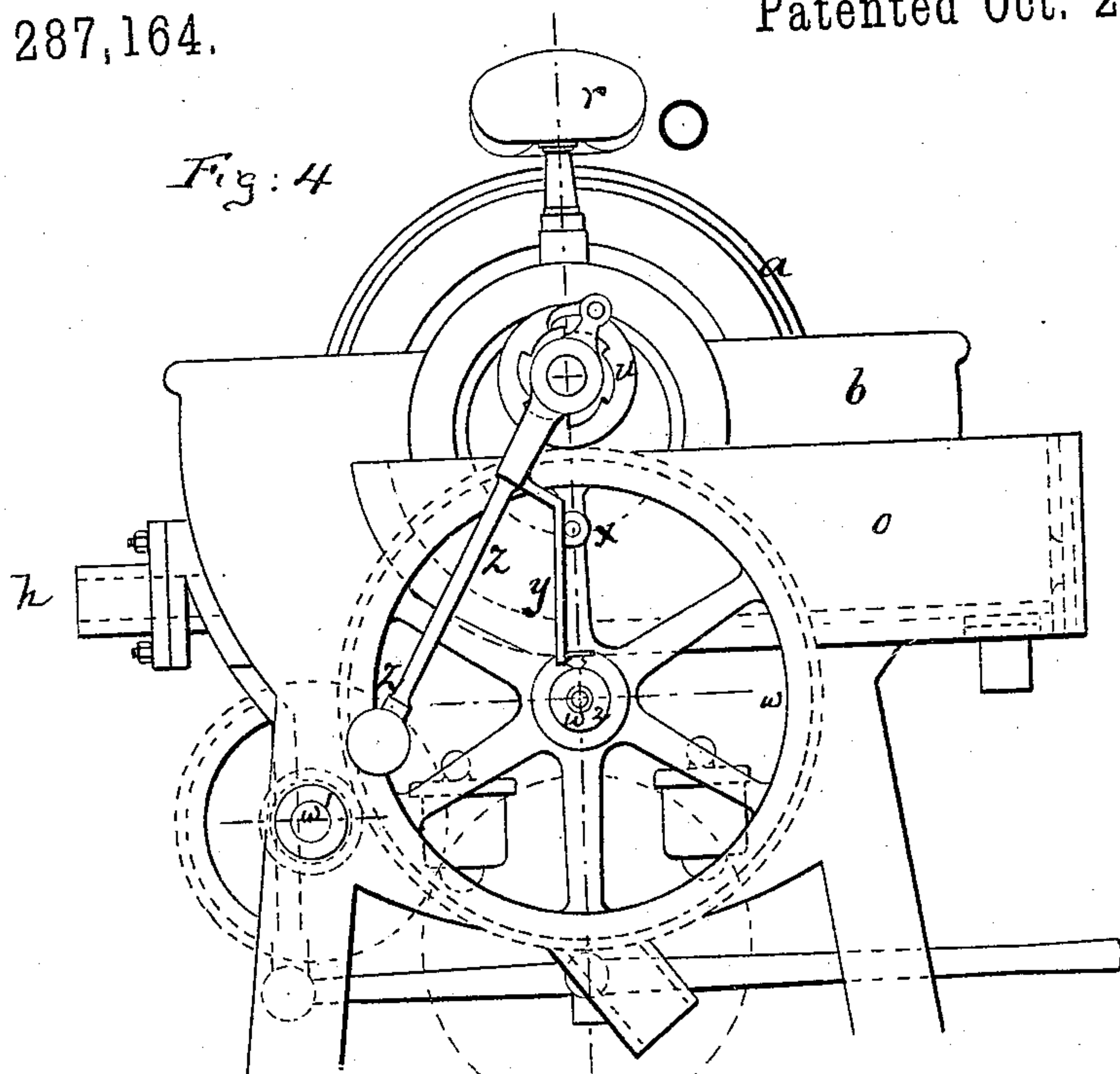
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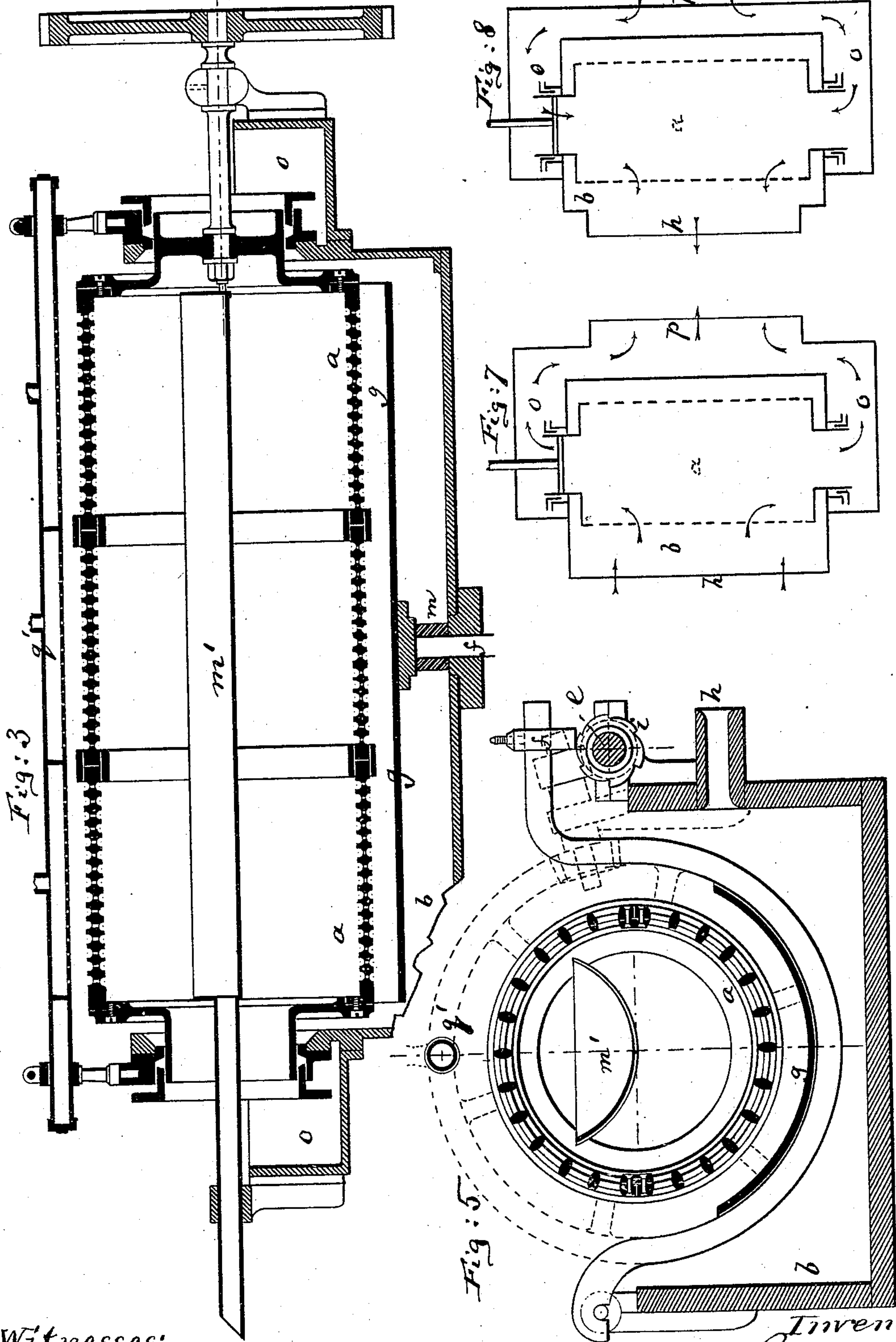
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UNITED STATES PATENT OFFICE.

HERMANN REINICKE, OF CÖTHEN, ANHALT, GERMANY.

PULP-STRAINER.

SPECIFICATION forming part of Letters Patent No. 287,164, dated October 23, 1883.

Application filed August 3, 1883. (No model.)

To all whom it may concern:

Be it known that I, HERMANN REINICKE, of the city of Cöthen, Duchy of Anhalt, Empire of Germany, have invented Improvements in Pulp-Strainers, of which the following is a specification, reference being had to the accompanying drawings, which form a part of it, and in which similar letters indicate corresponding parts.

Figure 1 is a vertical longitudinal section of a machine built according to my invention. Fig. 2 is a vertical cross-section of it. Fig. 3 is a vertical longitudinal section of a machine with external water-squirt. Fig. 4 is a front elevation. Fig. 5 is a vertical cross-section of a machine with external water-squirt and an altered tossing device. Fig. 6 shows the nut-locking device. Fig. 7 shows a skeleton plan of the pulp passing the cylinder from the outside; Fig. 8, a skeleton plan of the pulp passing the cylinder from the inside.

In the pulp-strainers hitherto used in the manufacture of paper the sieve-cylinder rotating in the pulp was tossed up and down, water being squirted upon its outer surface. The purified pulp was carried off through one of the trunnions of the sieve to the paper-machine. This construction of the pulp-strainer possesses many inconveniences. By tossing heavy masses—such as the sieve-cylinder with its bearings—the whole frame of the strainer was subjected to severe shocks, so that the running parts were soon destroyed. The pulp was liable to be too much diluted, and knots accumulated to such a degree that the box had to be emptied and the work temporarily interrupted.

The present invention furnishes a pulp-strainer which is free from all these deficiencies and disadvantages, and which requires only a small driving-power.

The sieve-cylinder *a*, the holes of which are of peculiar shape, as described afterward, rotates, with its hollow trunnions, in stationary bearings of a box, *b*, forming a part of the frame of the machine. One of the trunnions carries an inner cross, and is connected by it and by a train of gear-wheels to the main shaft *e*, from which the cylinder receives its rotary motion. Both trunnions connect the inside of the cylinder *a* with the trough *o*. The pulp can be

passed through the sieve-cylinder in two ways. It can, as in Fig. 7, enter the box *b* through the pipe *h*, pass the holes of the cylinder *a*, leave it through the hollow trunnions, and, after having traversed the trough *o*, leave the strainer for the paper-machine through the pipe *p*; or the pulp can enter through *p*, pass *o*, enter the cylinder *a* through its hollow trunnions, flow from there into the box *b*, and leave the strainer through *h*. (See Fig. 8.) In both cases it is necessary to agitate the pulp by an especial device, consisting, according to the invention, of a bent plate, *g*, provided in the box *b*, between its bottom and the sieve-cylinder. This agitator *g* rests by a rod, *f*, that passes through the bottom of the box *b*, upon a disk, *i*, which is mounted on the shaft *e*, and which bears on its circumference a suitable number of projections or rounded teeth. The turning motion of the shaft *e* will give to the agitator *g* a rapidly-tossing up-and-down motion, as is easily understood. Between the agitator *g* and the bottom of the box *b* a thick ring of soft rubber, *m*, is mounted round the rod *f*, to prevent any pulp escaping through the hole in the bottom of the box *b*, through which the rod *f* is passing. To the lower end of the rod *f* a cross-head, *f'*, is fastened, which is guided by the guide-rods *j*, fixed to the under side of the box *b*, and to the frame-work. To make the shocks elastic and the working of the tossing apparatus smooth and uninjurious to the whole strainer, springs *j'* and *j''* are arranged above and below the cross-head *f'*. The lower springs, *j''*, can be adjusted by means of nuts screwing upon the guide-rods *j*. The locking device of these nuts is shown in Fig. 6, and can be understood without further explanation. The agitator *g* may be made in one or more pieces, solid or perforated, &c., to suit the different kinds of pulp. Instead of driving the agitator *g* from below, it can be arranged as shown in Fig. 5. The main shaft *e*, with the cam-disk, is in this case situated along the top of one side of the box *b*, the beams supporting the agitator *g* and resting on the cam-disks of the shaft *e*, being hinged to suitable brackets on top of the other side of the box *b*. In case the pulp enters the box *b* and passes the sieve of the cylinder *a* from the outside, Figs. 1, 2, and 7, the squirting of the water ought to be

done from the inside; but if the course of the pulp is reversed, Figs. 3, 5, and 8, the squirting of the water takes place from the outside. To permit the use of the same sieve-cylinder in either of these cases, according to the will of the paper-maker, the holes of the sieve are constructed in a peculiar way. They are countersunk from both sides, bringing the smallest portion of the holes in the middle part of the sieve-plates. The squirting of the water may be executed by one pipe suitably perforated, and fed with water under proper pressure, as shown in Figs. 3 and 5, but which arrangement is liable to dilute the pulp too much. The device shown in Figs. 1, 2, and 4 is better adapted for the object in view. A large pipe, q , is connected by a number of branch pipes (here six) with a small pipe, q' , perforated in a proper way along its length, to squirt the water against the sieve-cylinder a and into its holes. Both pipes q and q' are divided by five cross-walls into six compartments, so that the first compartment of the large pipe q is connected by the first branch with the first compartment of the small pipe q' , the second with the second, and so on. The water is conducted through pipes s , lying inside of pipe q , into each single compartment of the pipes q and q' . The outer ends of these pipes s are fastened into the closing front wall of the pipe q , and flush with its front face, upon which is mounted a disk, t , which, being furnished with a hole corresponding to the diameter of the small pipes s , that are ranged in a circle, can be rotated by a ratchet device, u , operated by gear-connections from the main shaft e . The disk t moves in a chamber, v , through which enters the required water from a high reservoir or a pump. As long as the hole in the disk t corresponds with the pipe s of the first compartments of the pipes q and q' the water will squirt from the pipe q' against the revolving sieve a in a length corresponding to that of the first compartment of the pipe q' . If the disk t is turned so as to bring the opening in it opposite to the second pipe s , the second compartment only of the pipe q' will eject water, and so on over the whole length of the sieve-cylinder a , until the hole of the disk t comes again opposite to the first pipe s , whereby the squirting of the water begins again at the front end of the cylinder a . The ratchet device u is mounted upon the end of a central shaft of the disk t , which penetrates the chamber v by means of a stuffing-box. It receives its motion in the following way: The intermediate shaft, w' , connected by gear-wheels to the main shaft e , transfers the motion of the latter to wheel w , turning idly on the axle or pin w^2 , which is fastened to the machine-frame. On one arm of the wheel w is fixed a projecting driver-pin, x . The pawl which works into the ratchet-wheel u is hung to the short arm of a lever oscillating round the shaft of the ratchet-wheel u . The long arm z of this lever is weighted, and furnished with a branch dog,

y . The driver x meets, during each revolution of the wheel w , this dog y , and carries the pawl to the next tooth of the ratchet u . When the dog y falls from the driver x , the weighted lever z falls also, being stopped by the pin w^2 , and turns the ratchet u , and with it the disk t . The number of teeth of the ratchet u corresponds with that of the pipes s . According to the purchase of the main shaft e and the wheel w and the sieve-cylinder a , the hole of the disk t can be made to correspond with each pipe s during one revolution of the cylinder a —that is to say, at each revolution another sixth part of the cylinder-surface will be washed.

It must be understood that alterations can be made as to the number of compartments q and q' , or that of the holes in the disk t , as well as to the purchase of the disk t and the cylinder a . This arrangement of the squirting apparatus can be made use of when the water is squirting upon the sieve from the inside of the cylinder as well as if it were done from the outside. In the first case the water thrown through the holes of the sieve is collected, together with the knots, by and into the reversed trough r , Figs. 1 and 2, arranged outside and on top of the cylinder a . In the second case, Figs. 3 and 5, and in dotted lines, Fig. 2, the water and the knots are collected by and into the trough m' , arranged in the inside of the sieve-cylinder a , from where they are carried off by means of a pipe, which passes the open end of the cylinder a . In Fig. 2 is shown a very simple arrangement by which the pulp may be passed from the box b to the interior of the cylinder a , and then off through o and p ; or it may enter through o , pass the cylinder a from the inside, and leave the box b through h , according to the intention of the operator. The first arrangement is shown in Fig. 2 in full lines, and corresponds with Fig. 7. By opening the pipe h and closing the pipe p , the second arrangement will take place, as indicated in Fig. 2 in dotted lines, and which corresponds with Fig. 8.

The apparatus drawn in Fig. 5 is made use of if an acid pulp is to be worked, which would corrode the iron parts of the machines shown in the other figures. The box b and the agitator are made entirely of wood, or nearly so, and where iron would come in contact with the pulp it is coated or lined with a material which will not be corroded by acid pulp.

I claim—

1. In pulp-strainers, the sieve-cylinder a , rotating in stationary bearings, in combination with the agitator-plate g , working in the pulp, and with the rod or rods f , disk i , shaft e , and rubber ring m , substantially as shown, and for the purpose explained.

2. The combination of the cylinder a , box b , and trough m' , with the water-squirting pipe q' and agitator g , substantially as and for the purpose shown and described.

3. The sieve-cylinder a , constructed with

holes, which are countersunk from the inside and outside, so as to bring the narrowest portion of each hole in the middle portion of the sieve-plate, for the purpose specified.

5 4. The combination of the series of pipes *s* with the large pipe *q*, having compartments, and with the squirting-pipe *q'*, substantially as herein specified and shown.

10 5. The combination of the cylinder *a* with the pipes *q* and *q'*, which are divided into com-

partments, and with the pipes *s s*, perforated disk *t*, box *v*, and means, substantially as described, for turning said disk, all as specified.

This specification signed by me this 2d day of April, 1883.

HERMANN REINICKE.

Witnesses:

O. MÜLLER,
CARL FREDK. LOHMALYRIED.