

(No Model.)

2 Sheets—Sheet 1.

N. KAISER.

MACHINERY FOR ASSORTING WOOD PULP AND SIMILAR MATERIAL.
No. 276,250.

Patented Apr. 24, 1883.

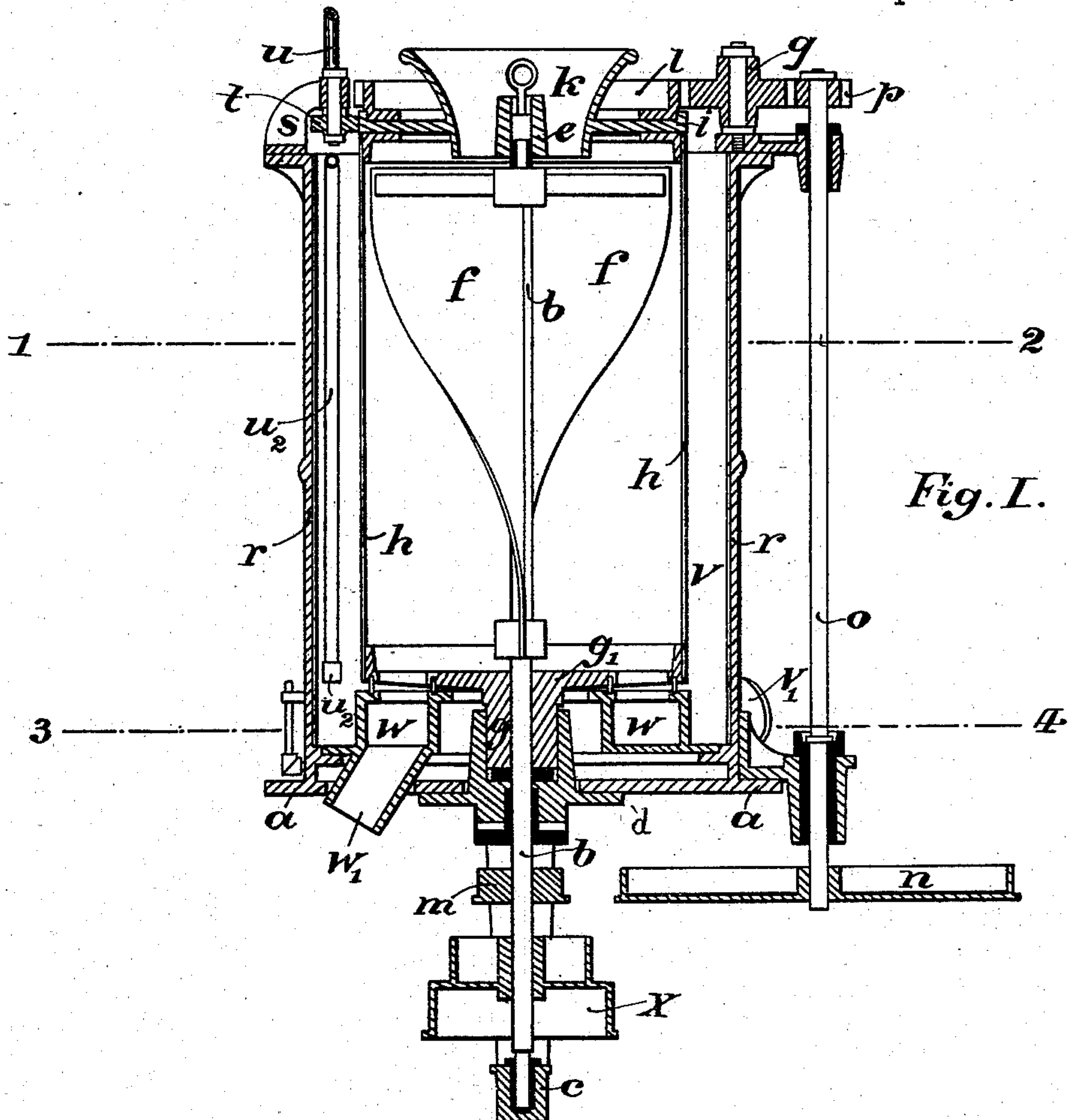


Fig. I.

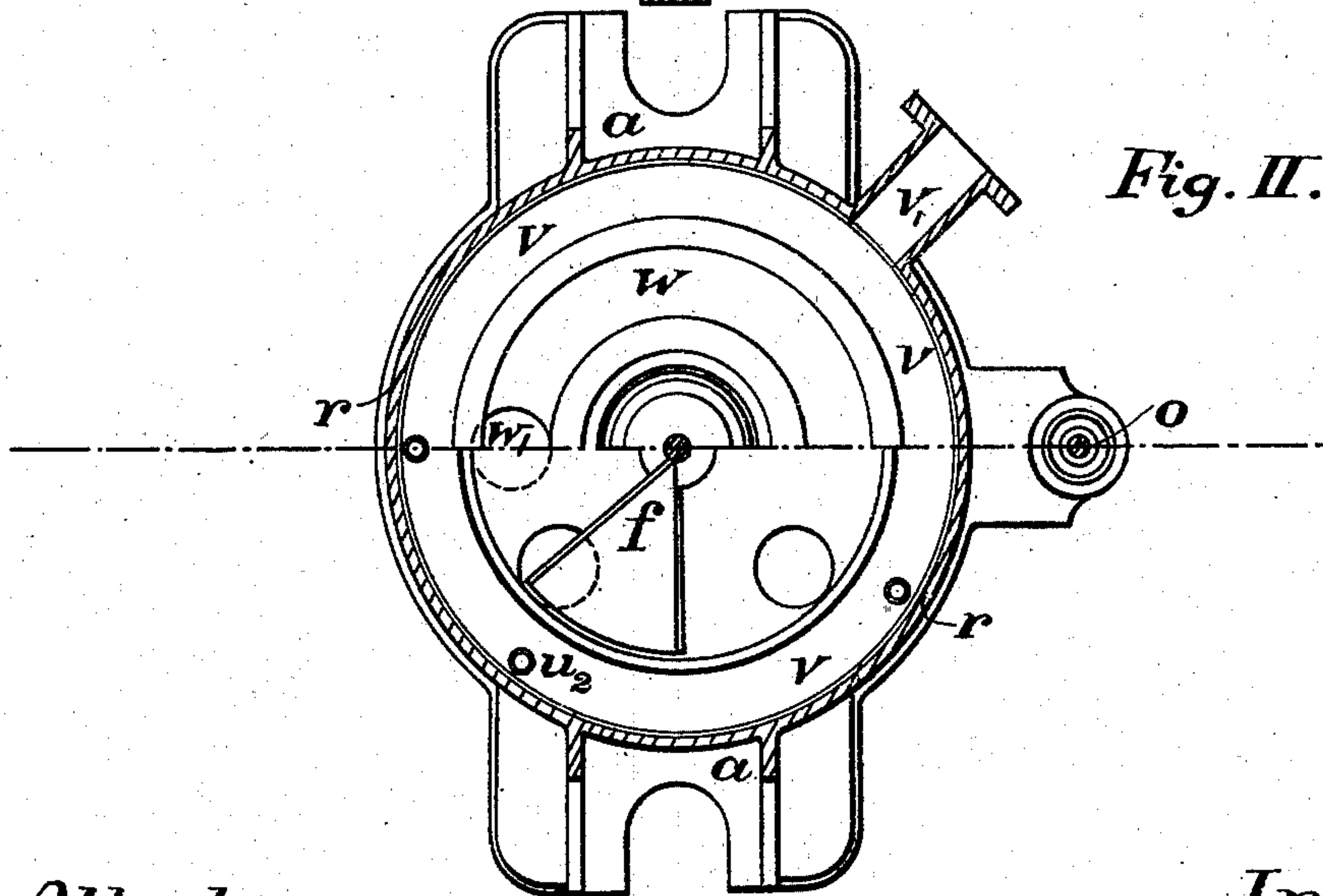


Fig. II.

Attest:
Rene Geelhaar
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Inventor:
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by Bruns & Co. atty

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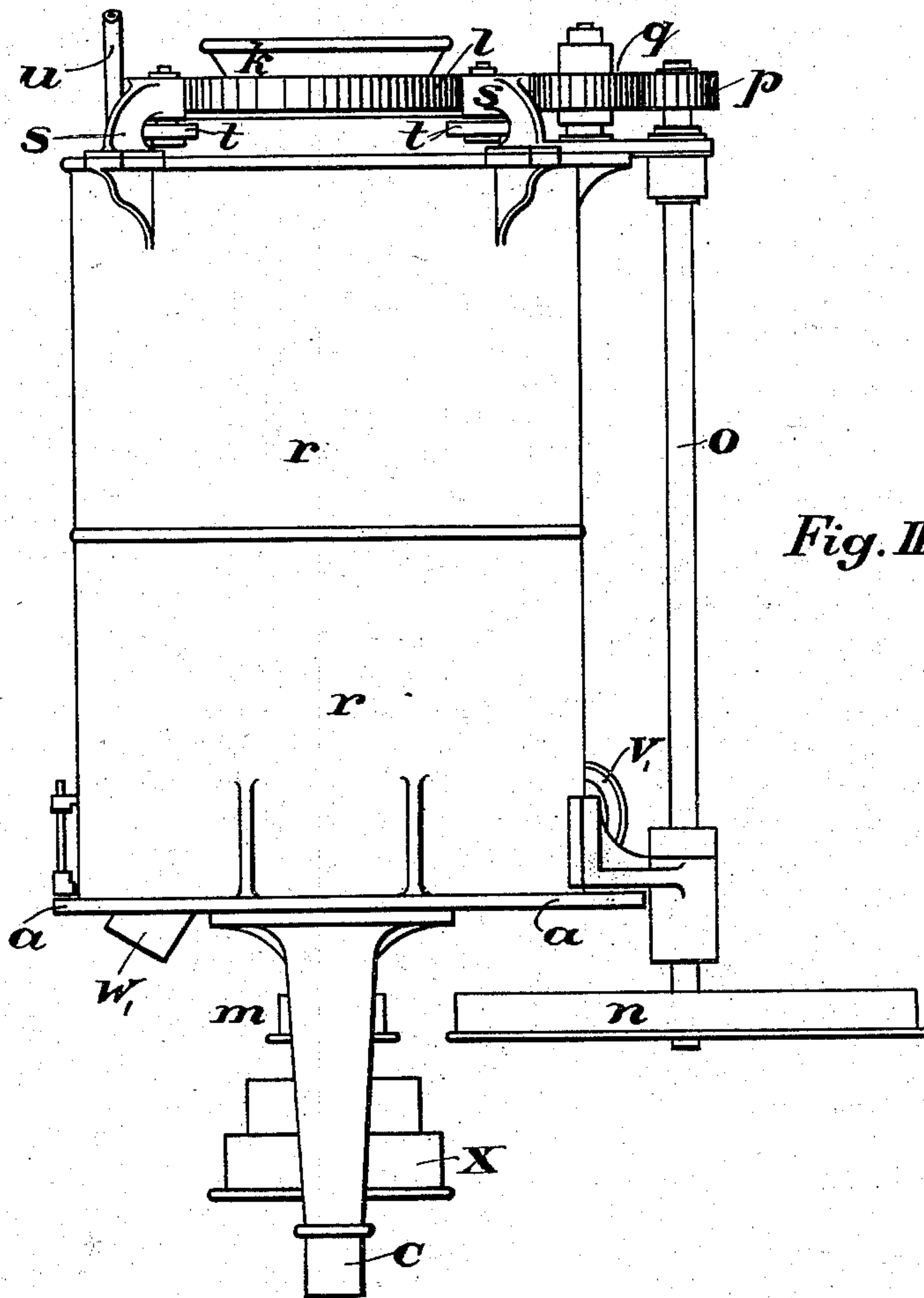


Fig. III.

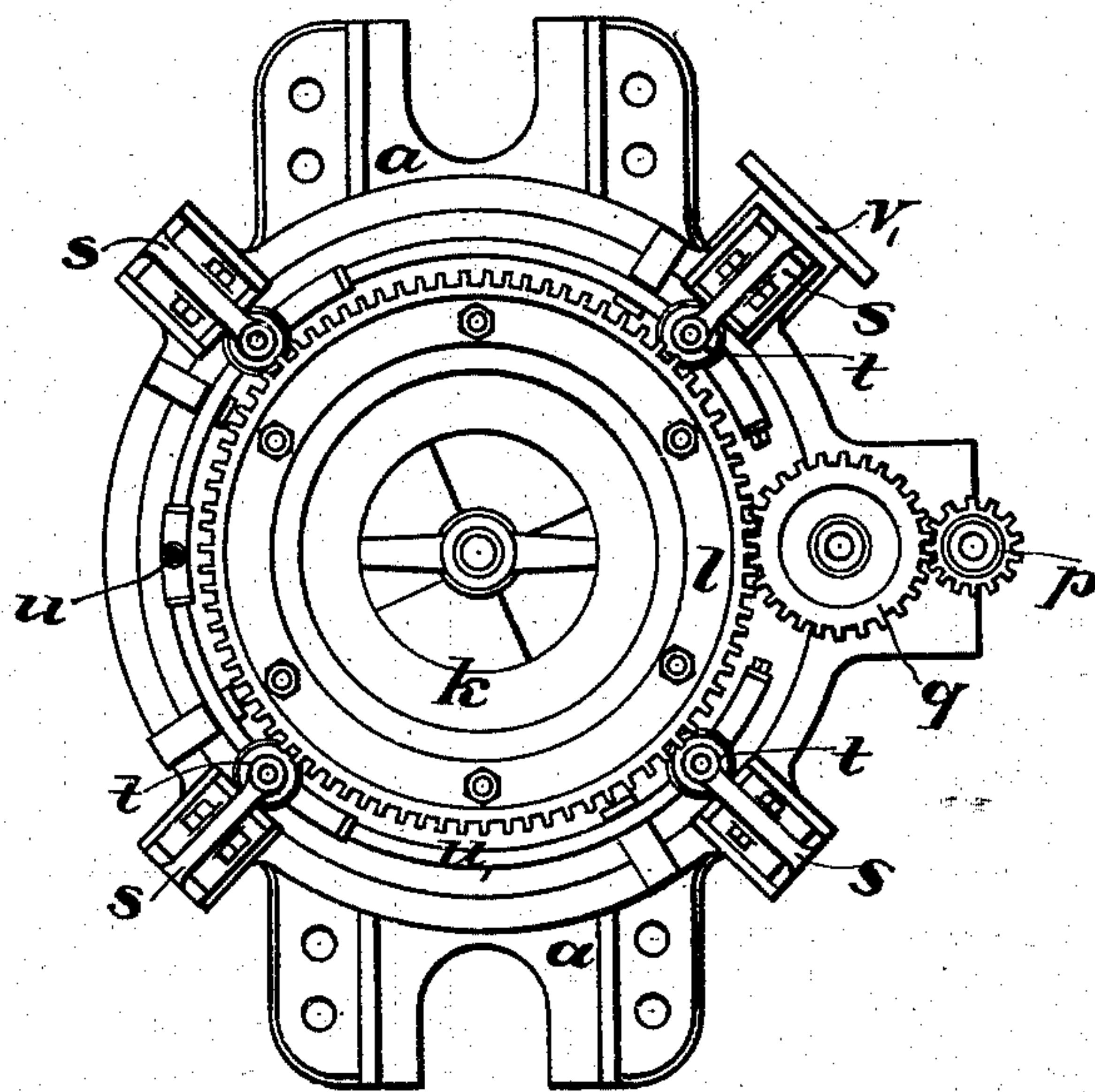


Fig. IV.

Attest:
Reni Seelhaas
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UNITED STATES PATENT OFFICE.

NICOLAUS KAISER, OF GRELLINGEN, SWITZERLAND.

MACHINERY FOR ASSORTING WOOD PULP AND SIMILAR MATERIAL.

SPECIFICATION forming part of Letters Patent No. 276,250, dated April 24, 1883.

Application filed February 20, 1883. (No model.)

To all whom it may concern:

Be it known that I, NICOLAUS KAISER, of Grellingen, in the Republic of Switzerland, have invented some new and useful Improvements in Machinery for Sifting and Assorting Wood Pulp and Similar Materials, of which the following is a specification.

My invention relates to certain improvements in sifting and assorting wood pulp and similar materials—to wit, in separating the coarse material from the small particles and watery substances. Heretofore the machines used for this purpose were principally built with shaking flat sieves placed at some inclination, or with revolving screen-drums, with or without stirring device in the inside, all these machines on the gravitation principle—that is, on the principle of agitating the pulp in order to spread it out uniformly over screen-sheets and to bring all its particles into reach of the screen-holes—the feeding of the pulp being effected in the case of flat screens by having the pulp to flow in a broad jet on the screens at their upper end, and, owing to the shaking motion of said screens, to have the pulp spreading uniformly over their whole area, thus causing the fine and watery substance to pass through the sieves and the coarse fibers to be conveyed to the lower end, therefore assorting the pulp according to length of fibers. In the case of cylindrical screens the feeding was effected in a similar way, with the difference that here the shaking motion was substituted by the revolving motion of the screens, and that this case allowed the use of stirring-wheels. It is easily seen what disadvantages this mode of sifting necessarily must show. The afflux of the pulp to the flat screens being effected on a relatively small part of their area, the pulp would accumulate to a lump, which could not flow apart fast enough and would be conveyed over the screens by the shaking without spreading uniformly over their whole surface, and would drop as a lump at their lower end, thus mixing coarse and fine stuff and giving an imperfect and wasteful sifting. In cylindrical screens the formation of such lumps was expected to be impossible, owing to the stirring device; but it is evident that the screens, being only worked at their bottom part, could not be of great capacity, requiring

therefore a disproportionate floor-space, driving machinery, and power. The pulp in this case could not be spread over the screen-surface in a film of even thickness, and would therefore give likewise an imperfect and wasteful sifting.

I am further aware that centrifugal machines have heretofore been made with an upright shaft provided with a continuous spiral blade, the whole arranged within a sieve. They have also been provided with screens constructed like that of the propeller. These constructions are employed for the purpose of producing a heavy pressure on the substance fed thereto, in order to extract juice therefrom. The said constructions do not have the least bearing on my invention, as it would be utterly impossible to produce the result required when applied thereto. I do not desire to produce a downward or upward pressure. What I wish to obtain is the distribution of wood pulp into a thin film by centrifugal force, which I accomplish with helicoidal-shaped blades made fast to a shaft arranged within a cylindrical sieve. It will be observed that the rapid rotation of the blades will throw the pulp against the screen or sieve and distribute it in a uniform and thin film, as required. It will also be observed that my invention does not perform the functions as required by the screw or propeller.

My invention has for its object to overcome all these defects, and bases on the centrifugal principle. Inside of a vertical screen-drum, being made stationary or revolving in either sense, a helicoidal fan mounted on a vertical shaft is made to revolve rapidly, throwing the pulp fed through a funnel-shaped inlet at the top of the drum against the inner walls of the screen, imparting to all particles a strong centrifugal motion, which causes the pulp to spread in a uniform film all over the inside of the screen, allowing the watery substance to pass through the holes, but the coarse material to remain inside and to drop to the bottom of the drum, thus separating the pulp according to length of fibers. The screen-drum is placed inside of a cast-iron tank of larger diameter, so as to have an annular chamber between screen and tank, wherein a number of water-jets perform rinsing duty, which surplus water, to-

gether with the sifted material, is carried off through an outlet at the bottom. Said cast-iron tank, having at its top a series of guide-rollers for keeping the screen-drum in a central position, has bolted or cast to its bottom plate, right underneath the screen-drum, an annular chamber with an outlet for the coarse material. By this arrangement the capacity of one machine is greatly increased, and therefore a considerable saving of floor-space, driving machinery, and power is obtained. Besides, owing to the strong centrifugal motion imparted to all particles, the pulp is spread in a uniform film over the whole screen, thus giving an even and perfect sifting process by straining all the whole of the screen to the same amount.

In Figure I a vertical section on the center line is given; in Fig. II, two horizontal half-sections on lines 1 2 and 3 4; in Fig. III, a side elevation, and in Fig. IV a plan.

Similar letters of reference indicate corresponding parts.

r r represent a cast-iron cylinder with bottom plate, *a*, the whole forming the main body of the machine. In bottom plate, *a*, bearing *d* for the fan-shaft *b* is provided, said bearing *d* carrying in a cup the lower hub, *g*, of screen-drum *h*, together with face-plate *g'*, said face-plate having large holes to prevent any accumulation of pulp inside screens *h*. Inside of cylinder *r*, on top of bottom plate, *a*, a cast-iron piece, forming an annular chamber, *w*, is solidly bolted or cast on, corresponding in diameter with the screen-drum, and being placed next underneath it, so as to receive all pulp dropped through the holes of face-plate *g'* and delivering it through outlet *w'*. The upper face-plate, *i*, of screen-drum *h* is provided at its center with a funnel-shaped inlet, *k*, wherein the top bearing, *e*, for the fan-shaft *b* is arranged, solidly connected with face-plate *i*, said inlet *k* delivering the pulp to be sifted into the interior of screen-drum *h*, which is made stationary or revolving in either sense, with exchangeable screens or sieves having circular or slotted holes of the size best suited for the material to be sifted. The screen receives its motion through gear-wheel *l*, bolted or cast on top of face-plate *i*, working into gear-wheels *q* and *p* on shaft *o*, said shaft being driven by belts on pulleys *n* and *m*, pulley *m* placed on the fan-shaft, which is the driving-shaft of the machine. Screen-drum *h* revolves independently on shaft *b*, hub *g* being fitted loosely to it, and the top face-plate, *i*, being guided by three or more guide-rollers, *t*, on brackets *s*, said brackets bolted to the top of cylinder *r r*. Inside of screen-drum *h* a helicoidal fan, *f*, with two or more blades, is mounted rigidly on shaft *b*, being the driving-shaft, and made to revolve rapidly, receiving its motion from belt on pulley *x*, between bearing *d* and *c*, said fan being made of about the same diameter as the inside diameter of the drum, leaving a small play and filling it to its whole height. The rela-

tive diameter of screen-drum *h* and cylinder *r* is made such as to form an annular chamber, *v*, between drum and cylinder, into which chamber the pulp passed through the screen-holes enters and drops to the bottom, where an outlet, *v'*, for the fine material is provided in said annular chamber *v*, water-pipes *u u²* performing rinsing duty.

Whenever the pulp to be sifted is fed through the funnel-shaped inlet *k*, it is caught by the rapidly-revolving fan *f* and thrown against the inner walls of screen-drum *h*, which is made stationary or to revolve in either sense, according to the desired fineness of work. The strong centrifugal motion imparted to the pulp causes it to spread in a uniform film all over the surface of the screen *h*, where the coarse fibers are retained, and, dropping to the bottom through face-plate *g'* into the annular space *w*, are led off through outlet *w'*; but the fine and watery material, passing through the holes or slots of screen *h*, flows to the bottom of the annular space between screen-drum *h* and cylinder *r*, and is washed off by the water-pipes *u u²*, placed therein for rinsing purposes. Thus, the whole surface of the screen being made effective, a large production per machine is possible, and, owing to the spreading out of the pulp in a uniform film, an even and perfect sifting is effected.

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

1. In a pulp sifting and assorting machine composed of drums and screens, a fan or other suitable means for assorting and sifting pulp by centrifugal force.

2. In a machine for sifting and assorting pulp, a fan provided with two or more helicoidal wings, in combination with a vertical screen-drum, being made stationary or revolving, substantially as shown and described.

3. In the machines for sifting and assorting pulp, the combination of a helicoidal fan with a vertical screen-drum, with exchangeable sieves or screens, said sieves or screens having circular or slotted holes, according to circumstances, all for the purpose set forth and described.

4. In the machine for sifting and assorting pulp, the combination of a helicoidal fan, *f*, mounted on a vertical shaft, *b*, within bearings *e d c*, screen-cylinder *h*, face-plates *i* and *g'*, hub *g*, funnel-shaped inlet *k*, cast-iron cylinder *r*, annular chamber *v* and *w*, outlet *v'* and *w'*, rinsing-pipes *u²*, guide-roller *t*, gear-wheels *q* and *p*, shaft *o*, and pulleys *n* and *m* and driving-pulley *x*.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, the 12th day of January, 1883.

N. KAISER.

Witnesses:

EMIL BLINN,
H. WUHRMANN.