

No. 688,050.

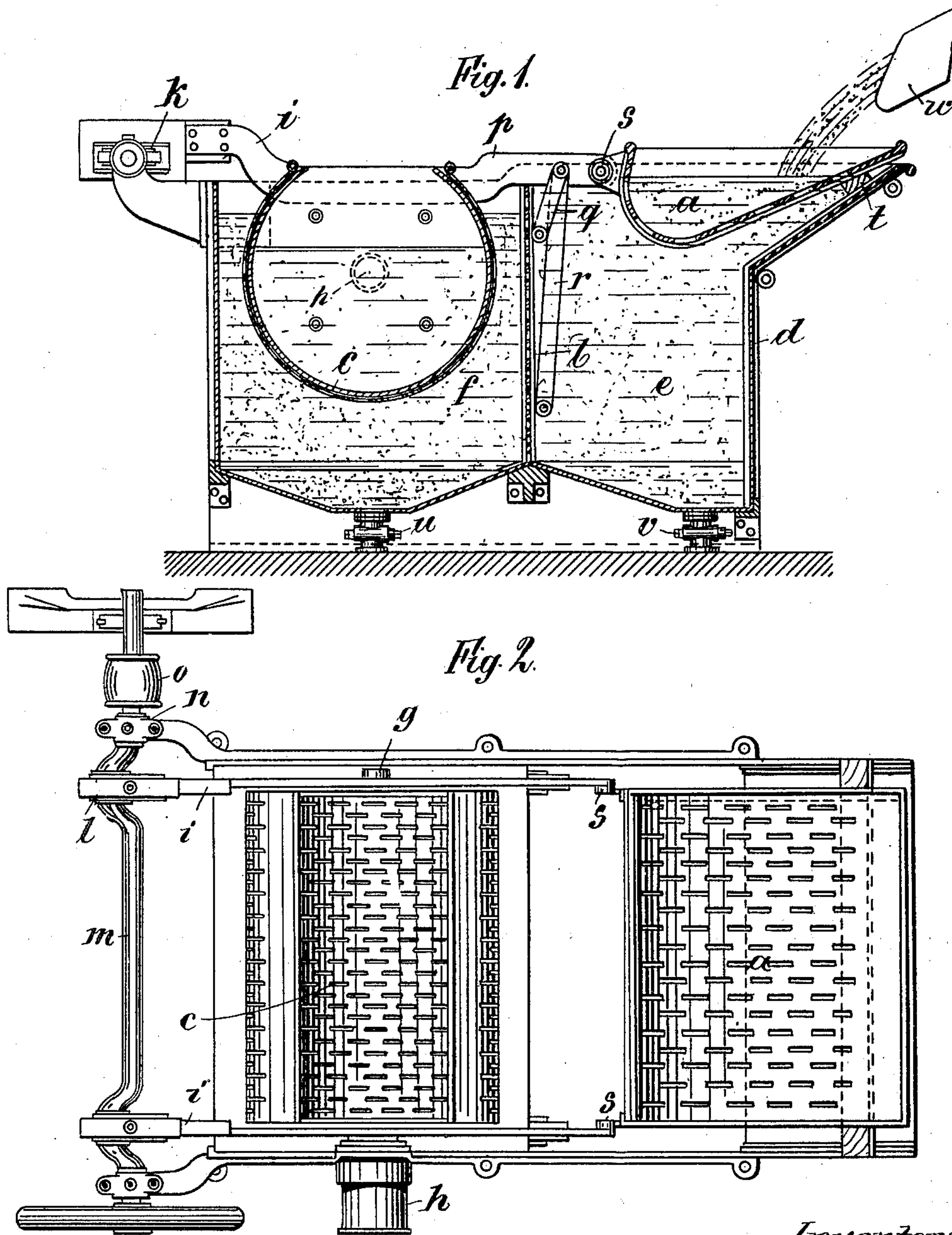
Patented Dec. 3, 1901.

L. ZEYEN & R. HAAS, JR.
PULP GRADING MACHINE.

(Application filed Apr. 15, 1901.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:
Tane. Hunter
A. H. Davis

Inventors
Rudolf Haas, Jr.
Leopold Zeyen
By *Mumford*
Attorneys

No. 688,050.

Patented Dec. 3, 1901.

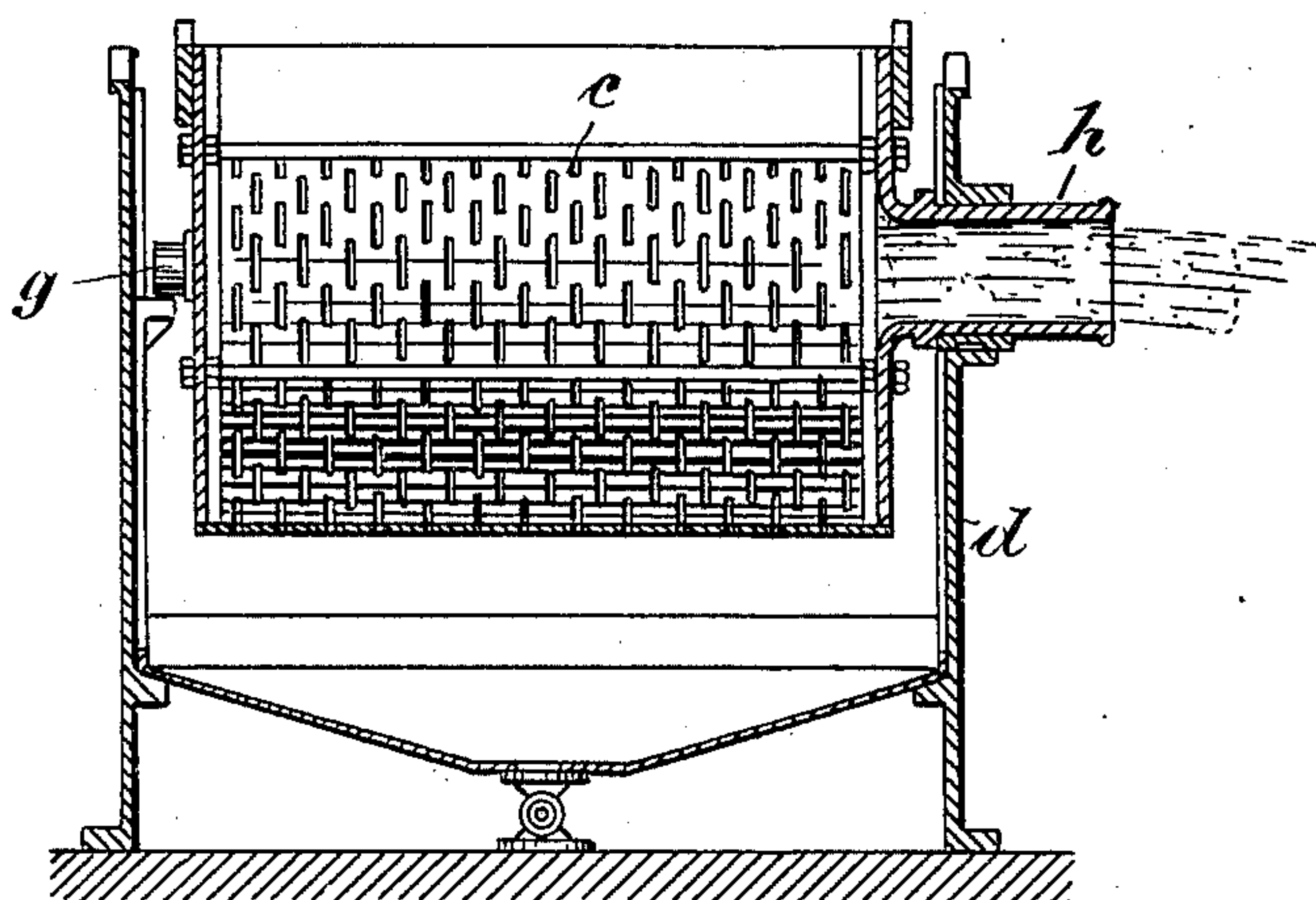
L. ZEYEN & R. HAAS, JR.
PULP GRADING MACHINE.

(Application filed Apr. 15, 1901.)

(No Model.)

3 Sheets—Sheet 2.

Fig. 3.



Witnesses:
Paul Hunter
A. H. Davis

Inventors
Rudolf Haas, Jr.
Leopold Zeyen
By *Munn*
Attorneys

No. 688,050.

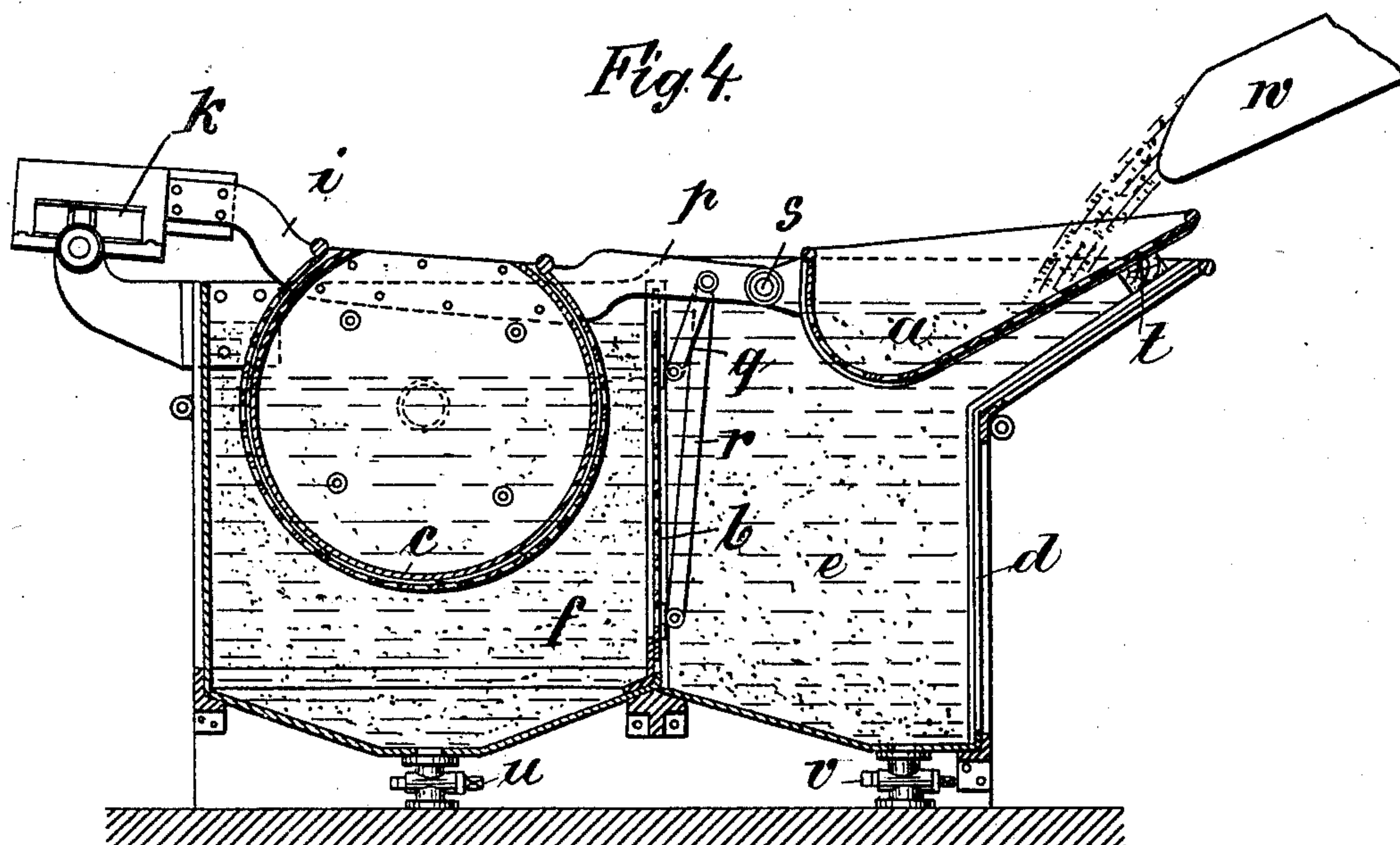
Patented Dec. 3, 1901.

L. ZEYEN & R. HAAS, JR.
PULP GRADING MACHINE.

(Application filed Apr. 15, 1901.)

(No Model.)

3 Sheets—Sheet 3.



Witnesses:
Paul Hunter
C. C. Holske

Inventors
Rudolf Haas, Jr.
Leopold Zeyen
By *Munn*
Attorneys.

UNITED STATES PATENT OFFICE.

LEOPOLD ZEYEN, OF RAGUHN, AND RUDOLF HAAS, JR., OF MAUEL,
GERMANY.

PULP-GRADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 688,050, dated December 3, 1901.

Application filed April 15, 1901. Serial No. 55,874. (No model.)

To all whom it may concern:

Be it known that we, LEOPOLD ZEYEN, a resident of Raguhn, in the Duchy of Anhalt, and RUDOLF HAAS, Jr., a resident of Mauer, near Gemünd, in the Province of the Rhine, Prussia, Germany, subjects of the German Emperor, have invented a new and Improved Pulp-Grading Machine, of which the following is a full, clear, and exact description.

Our invention relates to a machine for sorting or grading paper-pulp while it is suspended in water by means of sieves, and has for its object to enable the grading to be effected without a change of sieves and in such a manner that the various grades of pulp obtained may be taken from the machine simultaneously as required. We arrange a series of sieves having different mesh or fineness in compartments and adapt each to have a limited movement. By such arrangement we collect in each of the compartments pulp of a predetermined grade only, (according to the fineness of the sieve at the outlet end of said compartment,) and the separation of the finest grade of pulp is gradual. Thus we may take from each compartment pulp of a proper grade for each particular purpose, and the work to be performed by the finest sieves is reduced, thus minimizing the danger of clogging. The progressive separation of the fine pulp also contributes to this result. The sieves may thus be kept clean readily and the efficiency of the machine is increased.

For the present needs of paper manufacturers three grades of pulp will be sufficient. The machine is therefore preferably provided with a coarse first sieve, a central sieve of medium fineness, and a fine sieve at the end, these sieves dividing the common vat or receptacle into four compartments or chambers.

It is advisable to employ a fine sieve of cylindrical shape, so as to secure a large surface and high efficiency, and preferably the pulp should pass through the sieve inward, so as to facilitate cleaning. The central sieve for the sake of simplicity will generally be plane and disposed vertically or inclined to enable it to be readily cleaned. The first or coarse sieve fulfils its office best when made trough-shaped, as this construction makes it easy to remove splinters of wood and other foreign

matters with a rake. It is well to keep all the sieves in motion during the operation, so as to prevent clogging of the openings.

Reference is to be had to the accompanying drawings, which show a form of our invention which we believe to be particularly well adapted to its purpose.

Figure 1 is a longitudinal section of the machine. Fig. 2 is a plan thereof, and Fig. 3 is a cross-section through the vat and the fine sieve. Fig. 4 is cross-section illustrating the operation or movements of the several sieves.

w is a spout for feeding the pulp into the trough-shaped coarse sieve *a*, disposed at the inlet of the vat *d* and resting with one end upon a wooden supporting-bar *t*, while the other end is pivotally connected at *s* with arms *p*, rigidly secured to the body of the fine sieve *c*, which is cylindrically curved, its axis being horizontal. This sieve may be open at the top, as shown, and is journaled in the vat *d* by means of trunnions *g* and *h*, of which the latter is hollow and serves as an outlet for the fine pulp which has passed through said sieve *c*. Between the sieves *a* and *c* is located the intermediate or central sieve *b*, mounted to slide vertically in suitable guides and connected with the arms *p* by means of links *q* and *r*. This sieve divides the vat *d* into compartments *e* and *f*. To the sieve *c* are attached arms *i*, provided with slots *k*, into which fit crank portions *l* of a shaft *m*, journaled in bearings *n* of the vat *d*. A pulley *o* is provided for the reception of a driving-belt. At the bottom of the compartments *e* and *f* are outlets controlled by cocks *v* and *u*, respectively. The coarse sieve *a* should project above the level of the liquid, and the sieves *b* and *c* are progressively finer.

The arms *i* being rigidly secured to the heads of sieve *c*, it is apparent they have the same center of motion or vertical oscillation as the latter, and hence as the shaft *m* rotates, its cranks having free play in the slots *k* of said arms *i*, the latter and the sieve *c* will be rocked or oscillated on the trunnions *g h*; also, that the central sieve *b* will be reciprocated vertically by means of the links *q r*, which connect it loosely with the arms *i*, and that the tray-like sieve *a* will be reciprocated horizontally as a whole, while its larger

and inner end will be alternately raised and lowered at the same time in the arc of a circle, the wooden block *t* serving as the fulcrum or center of such oscillation. The result is as follows: The pulp fed through the spout *w* is freed by the sieve *a* of all large foreign matters, which may be raked off the surface of the liquid in said sieve. The pulp which passes through the sieve *a* into the first compartment *e* is coarse, but may be sometimes used for the manufacture of some grades of paper or for other purposes, and this grade of pulp may be withdrawn by opening the cock *v*. The finer particles of pulp then pass through the intermediate sieve *b* into the second compartment *f*, and a finer grade of pulp suitable for the manufacture of paper of a better quality may be let off from said compartment by opening the cock *u*. Finally, the pulp passes through the sieve *c*, and the finest grade of pulp is thus discharged through the hollow trunnion *h*. In case the lower grades of pulp are not used they will accumulate at the bottom of the vat *d* and should be removed from time to time by opening the cocks *u* and *v*. The continuous shaking of the sieves facilitates the passage of the pulp and prevents their clogging. The sieve *b* may be inclined instead of vertical, if desired; but in any case it serves to divide the vat *d* into two compartments.

It will be seen that the movements of the several sieves being different and in a measure opposed to each other no persistent waves or currents are set up in the liquid and the latter is not liable to be splashed out of the vat.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. A machine for grading paper-pulp and the like, consisting of a vat and a series of sieves arranged therein, one of them dividing said vat into compartments, and the other two being located in the respective compartments thus formed, the sieves being progressively finer from the inlet to the discharge, substantially as shown and described.

2. A machine for grading paper-pulp and the like, consisting of a vat, a trough-shaped sieve arranged at the inlet of the vat, a sieve dividing the vat vertically, and another sieve located in the vat between such vertical sieve and the outlet, and all the sieves being progressively finer in mesh, as shown and described.

3. A machine for grading paper-pulp and the like, comprising a vat, a cylindrical sieve arranged at the outlet of the vat, and a trough-like coarser sieve located between said cylindrical sieve and the inlet of the vat, the same being adapted to oscillate, substantially as shown and described.

4. A machine for grading paper-pulp and the like, consisting of a vat, a trough-shaped

sieve arranged at the inlet of the vat and adapted to rock, means for imparting a rocking motion to said sieve, and another, finer sieve located in the vat between said trough-shaped sieve and the outlet, and means for oscillating the same, substantially as described.

5. In a machine for grading pulp, the combination, with a vat and a rocking sieve into which the pulp is received, of a vertically-reciprocating sieve, and means for imparting motion to said sieves, substantially as shown and described.

6. In a machine for grading pulp, the combination with a vat and a trough-like sieve arranged therein, of a vertically-reciprocating sieve dividing the vat into compartments, and means for rocking and reciprocating the sieves respectively, as shown and described.

7. In a machine for grading pulp, the combination with a vat and a trough-like sieve for receiving the pulp, of a cylindrical pivoted sieve having a finer mesh, and means for rocking it, both sieves being arranged in the vat, as shown and described.

8. In a machine for grading pulp, the combination with the vat and pulp-receiving sieve, of a second sieve, having a finer mesh and mounted on trunnions so as to oscillate, and an arm connecting the two sieves, and means for oscillating it in a vertical plane, as shown and described.

9. In a machine for grading pulp, the combination with a vat, of a sieve dividing it vertically into compartments having separate outlets at the bottom, a pulp-receiving sieve arranged in the first compartment, and a rocking sieve arranged in the second compartment and having a pulp-outlet, the said sieves being of progressively-finer mesh, and means for imparting motion to the receiving and outlet sieves, substantially as shown and described.

10. A machine for grading paper-pulp and the like, comprising a vat, a trough-shaped coarse sieve mounted to rock at the inlet of the vat, a cylindrically-curved fine sieve journaled to turn about its axis at the outlet of the vat, a central sieve of intermediate fineness mounted to slide in the vat between the other two sieves, and means for imparting to the respective sieves, a rocking, oscillating, and reciprocating motion.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

LEOPOLD ZEYEN.

RUDOLF HAAS, JR.

Witnesses to signature of Leopold Zeyen:

JOHANNES HEIN,

WOLDEMAR HAUPT.

Witnesses to signature of Rudolf Haas, Jr.:

CHARLES L. SIMPLE,

KARL SCHMITT.