

No. 721,390.

PATENTED FEB. 24, 1903.

P. REINICKE.
PULP STRAINER.

APPLICATION FILED JAN. 9, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

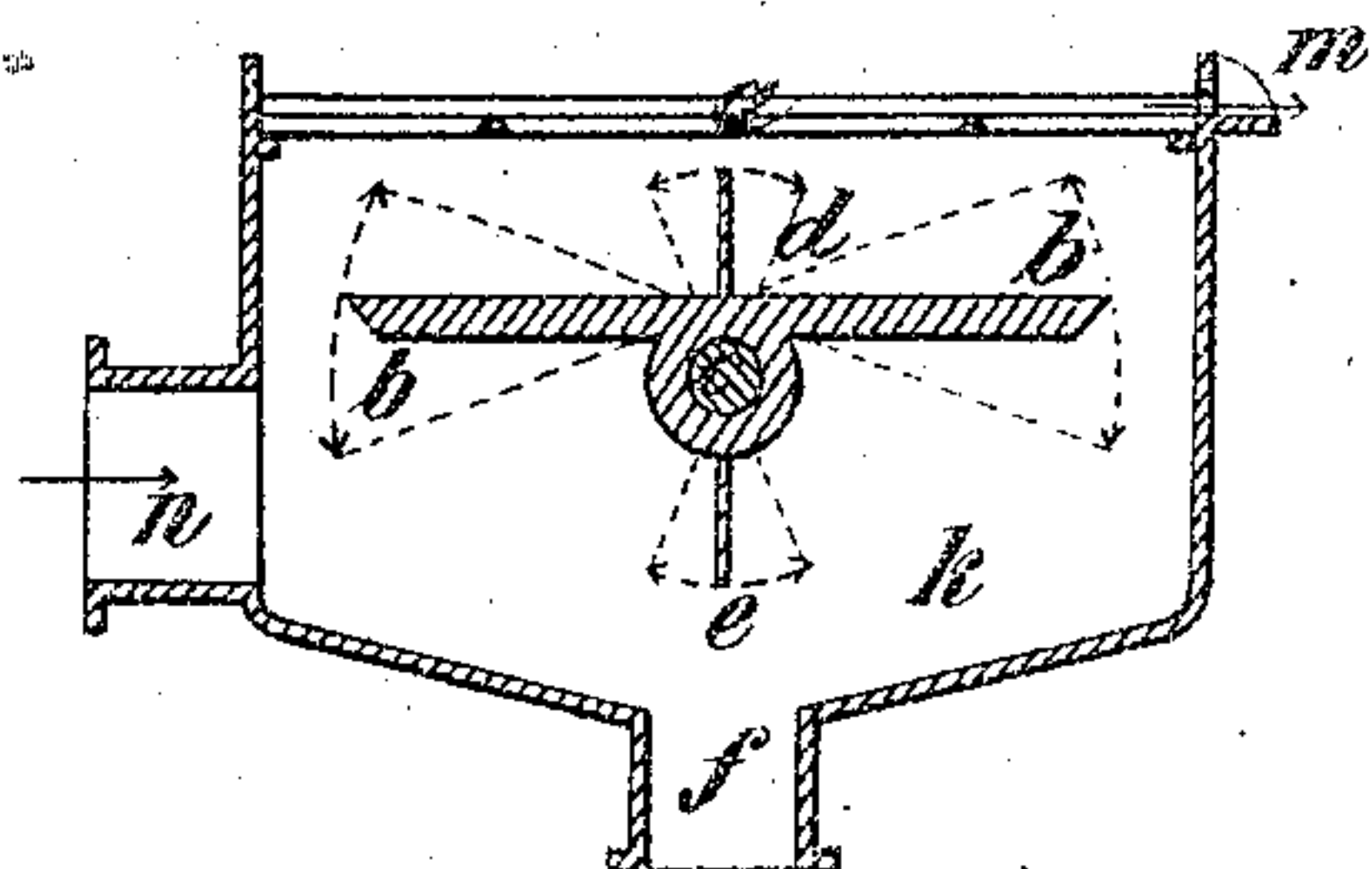


Fig. 2.

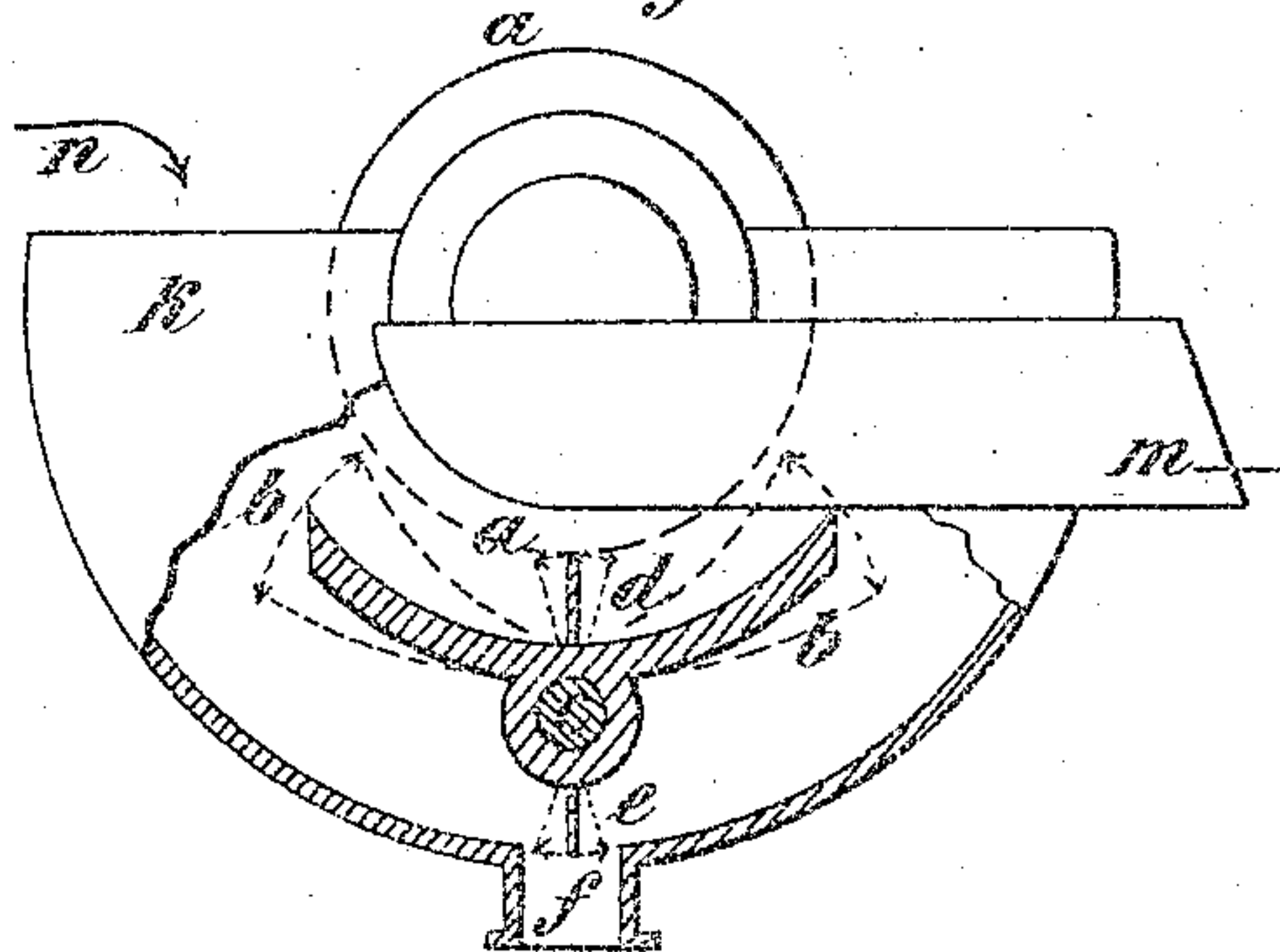


Fig. 3.

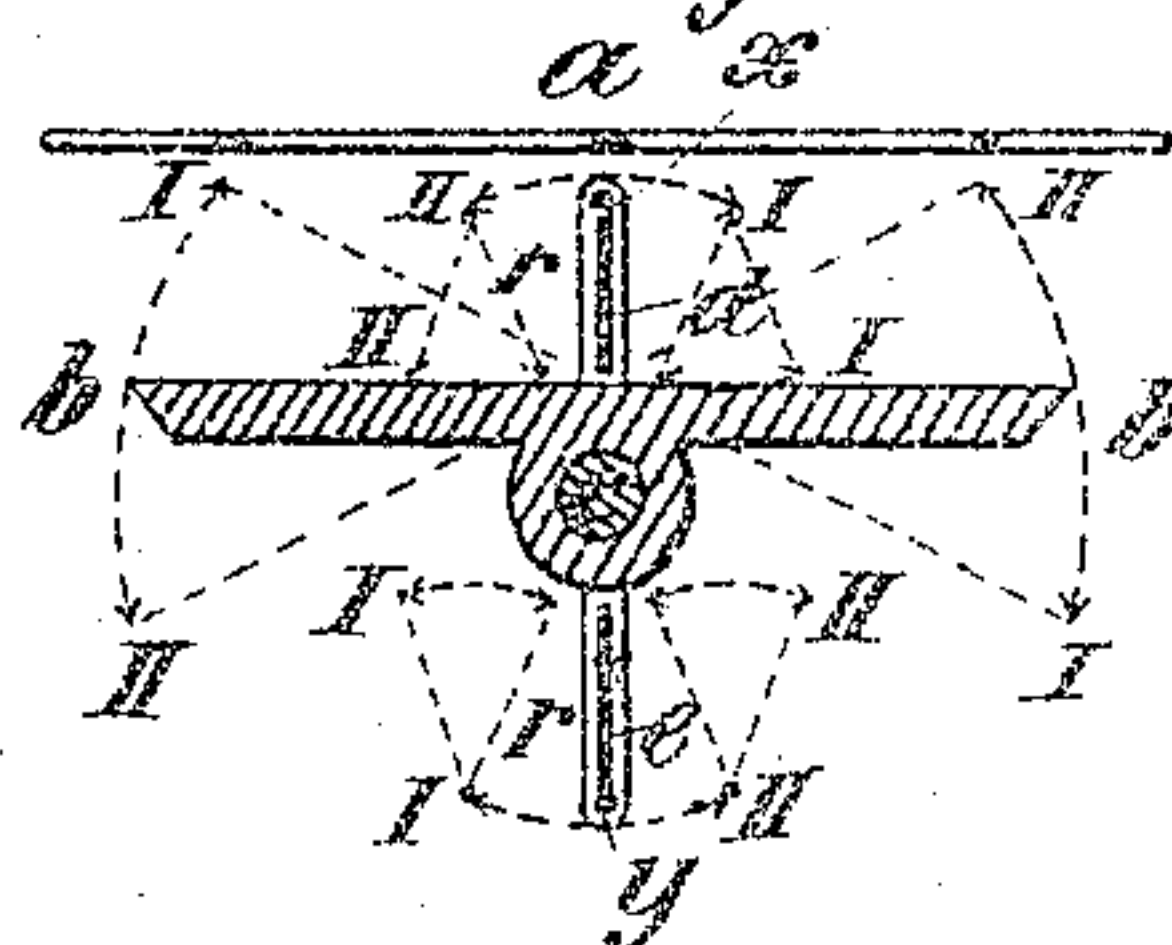
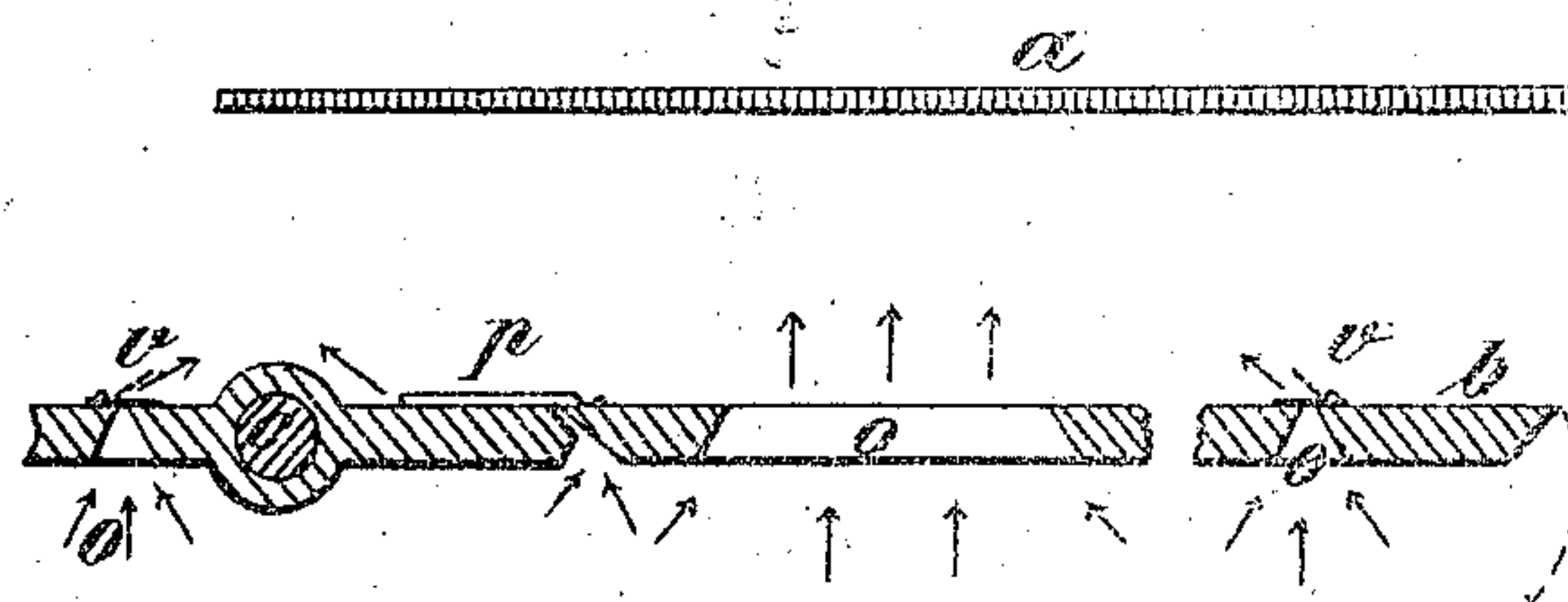


Fig. 4.



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2 SHEETS—SHEET 2.

Fig. 5

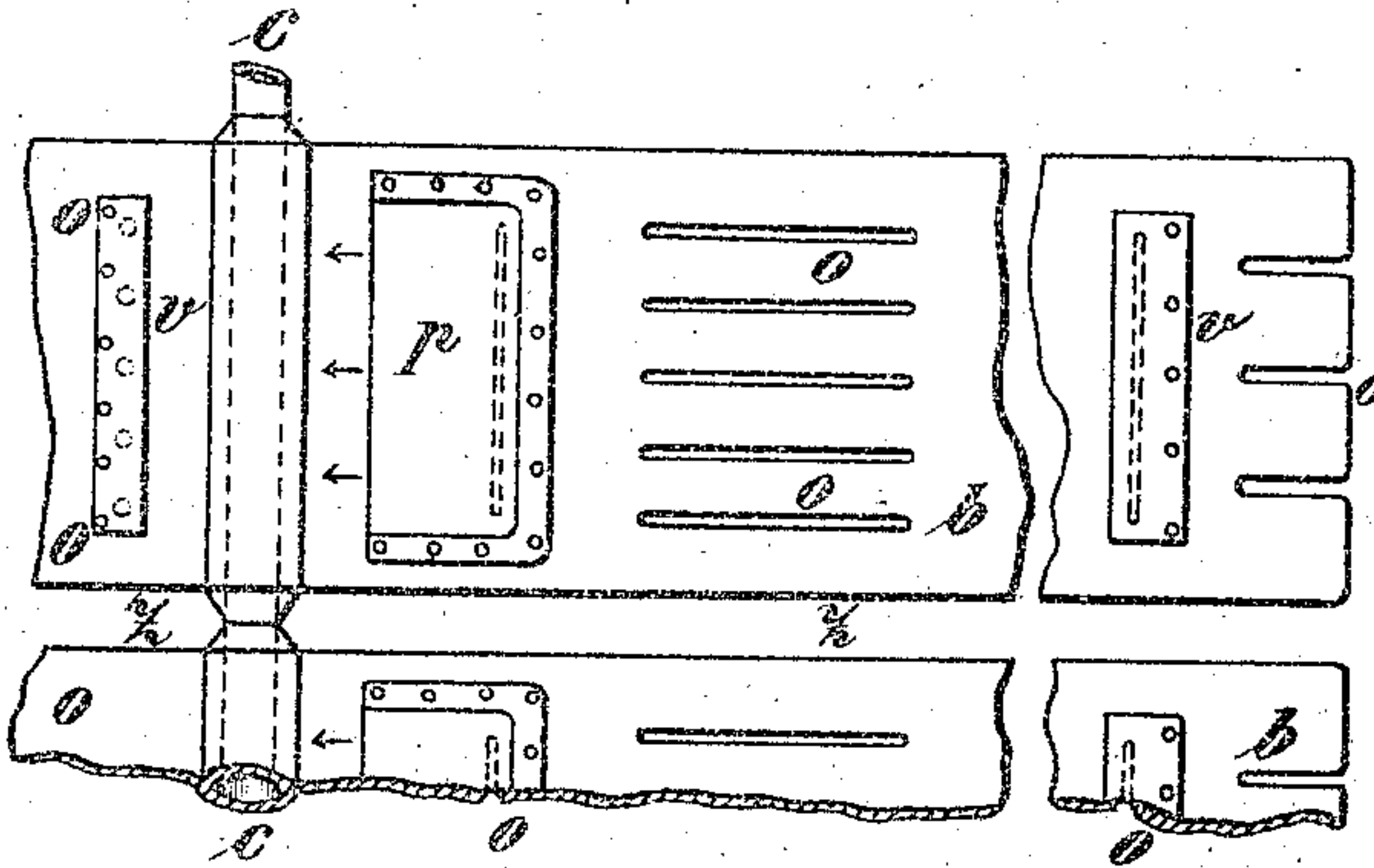


Fig. 6

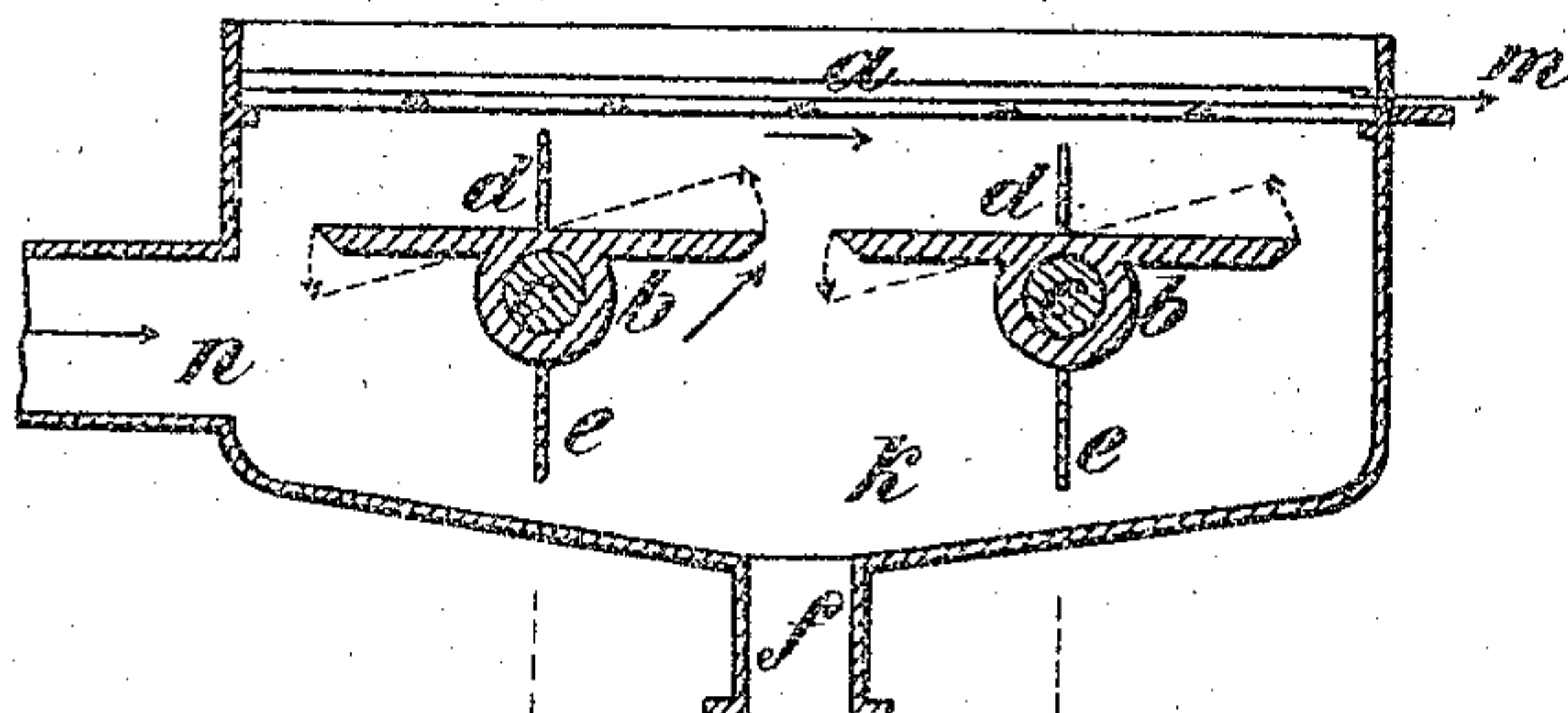
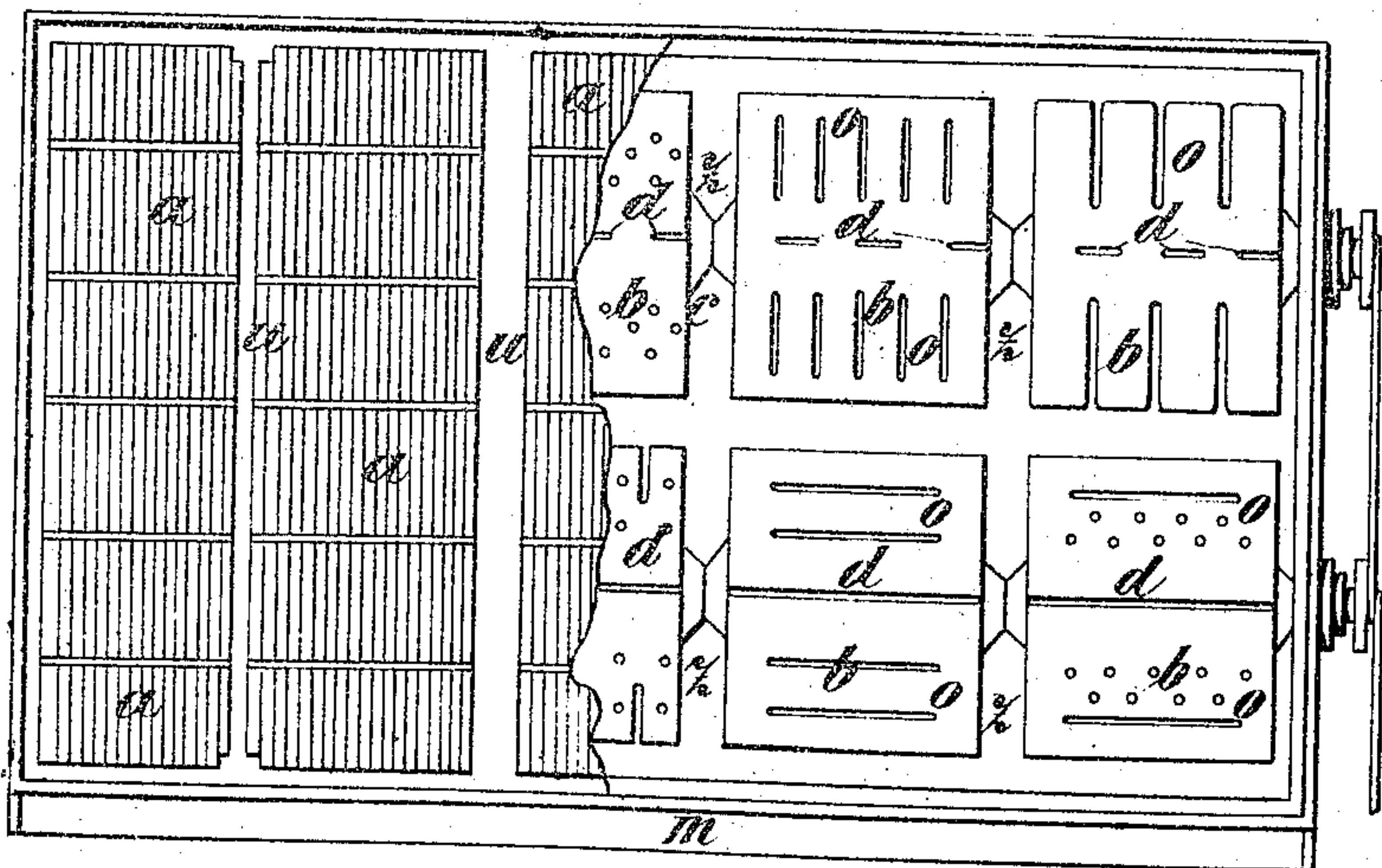


Fig. 7



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UNITED STATES PATENT OFFICE.

PAUL REINICKE, OF KÖTHEN, GERMANY.

PULP-STRAINER.

SPECIFICATION forming part of Letters Patent No. 721,390, dated February 24, 1903.

Application filed January 9, 1902. Serial No. 89,039. (No model.)

To all whom it may concern:

Be it known that I, PAUL REINICKE, manufacturer, a subject of the Duke of Anhalt, residing at No. 19 Baasdorferstrasse, Köthen, in the Duchy of Anhalt, in the German Empire, have invented certain new and useful Improvements in Pulp-Strainers, of which the following is a specification.

Pulp-strainers with beating-wings for moving the pulp through the screen-plates are possessed by the drawback that the uniform distribution of the filling and fibrous stuff in the liquid pulp is disturbed. The speed of the motion decreases in the direction from the exterior edges of the wings to the axles of the same and every stroke or movement of the wings directed against the pulp causes an interruption in the movement of the latter and a partial increase in bulk, which it is true is done away with by the next oscillation, but brings about in connection with the aforementioned peculiar action of the oscillations of the wings an accumulation of the particles of the mass between the wings and the screen-plates, principally around the axle of the wings, whereby the uniform distribution of the filling and fibrous substances in the liquid pulp which is important for the good quality of the paper to be manufactured is greatly impaired.

The object of the present invention is to overcome the aforementioned drawbacks by means of arrangements adapted to cause an intense movement and mixing of the pulp as a whole and particularly at those places where the particles tend to settle.

To attain this object, I make use of the following arrangements: First, beating-pieces, (arms, ledges, plates, wings, and the like,) which are arranged in the neighborhood of the axle of the wings and are moved in such a manner that they tend to bring about currents in the liquid pulp directed parallel to the surface of the beating-pieces; second, the arrangement of funnel-shaped apertures and interstices in the beating-pieces which are directed with their narrow mouths against the screen-plates whereby on the wings moving backward powerful currents of pulp are driven into the space between the screen-plates and

the wing-plates; third, the arrangement of several systems of beating-wings side by side in one pulp-strainer vat in such a manner that the interruptions of the movement of the pulp caused by the oscillations of one system are compensated by the simultaneous oscillations of the neighboring system and that, further, the settling places of the fibrous substances are constantly washed.

In order to make my invention more clear, I refer to the accompanying drawings, in which similar letters denote similar parts throughout the several views, and in which—

Figure 1 is a diagrammatical cross-section through a pair of beating-wings intended for use in a plain pulp-strainer. Fig. 2 is a similar section showing a pair of wings for use in a rotary strainer. Fig. 3 is a section similar to Fig. 1, there being, besides the horizontal wings, vertical beating-pieces, too. Fig. 4 is an enlarged detail view of a part of a horizontal wing. Fig. 5 is a plan of Fig. 4. Fig. 6 is a vertical section through a plain strainer having two sets of wings side by side; and Fig. 7 is a plan of such a strainer, a part of the screen-plate being removed.

Referring to Fig. 1, *a* indicates the screen-plate, below which oscillate the beating-wings *b*, which are secured to the axle *c*. This axle carries also the beating-pieces *d* and *e*, which oscillate in the same manner and cause a movement of the liquid pulp parallel to the wings *b*, whereby the accumulation of particles of the stuff between the screen-plate and the wings and around the axle is prevented.

The beating-pieces *d* *e* may, as shown in Fig. 3, swing around axles *x* *y* of their own, said axles having their bearings or fulcrums in arms *r*, fixed to the axle *c*. The extreme positions of this system of wings are indicated by I and II.

Figs. 4 and 5 show a beating-wing *b*, provided with funnel-shaped apertures *o*. These apertures are bordered by oblique surfaces, which converge toward the screen-plate *a*. On the wings *b* moving backward the liquid pulp is forced into these apertures and is driven in powerful currents into the space above the wings. By means of plates situ-

ated above the narrow mouths of these apertures or by a corresponding obliqueness of the bordering surfaces the currents of the pulp may be directed to such definitive places where by experience the accumulation of the particles of the stuff occurs most easily. In this manner the plate *p*, nailed over the aperture *o*, directs the current of the pulp away over the axle *c*. The elastic or resilient plate *v* directs the current of the liquid also against the axle. For the rest it acts similar to a valve and does not let pass any liquid pulp on the wing moving forward. As the narrow mouths are directed against the screen-plate *a*, the pumping action of the wing is either not diminished at all or only in an immaterial degree. The beating-wings are subdivided in smaller plates by means of intermediate spaces *z*, whereby the mixing is also influenced and the movement of the liquid pulp in an upward direction over the wings is facilitated.

In Figs. 6 and 7 is shown a plain pulp-strainer vat containing two systems of wings arranged one parallel to the other. As shown in Fig. 6, the ascending wing moves the liquid pulp upward and forces it, moreover, also laterally over the neighboring wing, which descends just at that time, whereby an accumulation over this wing is done away with. The liquid pulp enters the vat at *n* and leaves the same at *m*, and *f* is an aperture or piece of tube by means of which the vat *k* may be entirely emptied. This aperture or piece of tube is of course provided with means (not shown) by which it may be closed.

That part of Fig. 7 which is freed from the screen-plates *a* shows the combination of the three arrangements intended to attain the object of the invention, viz: the parallel arrangement of two systems of wings in one vat; further, the arrangement of the beating-pieces *d* (the beating-pieces *e* must be supposed to lie below the surface of the figure) and the funnel-shaped apertures *o* in the beating-wings.

The main carriers *u* of the screen-plate *a* are located in this instance vertically to the axes of the beating-wings, by means of which arrangement those parts of said carriers that dip into the liquid pulp may be more easily kept free from adhering pulp.

As proved, all the three arrangements serve singly, as well as in appropriate combinations, for maintaining the uniform distribution of the filling and fibrous substances suspended in the liquid by means of an energetic mixing and moving of the same, as well as by a combined washing of the chief settling places of these substances.

The invention may be employed, of course, in connection with pulp-strainers of any desired kind—for instance, plain pulp-strainers and rotary pulp-strainers—which are furnished with beating-wings for accelerating the

passage of the stuff through the screen-plates, and the direction of said passage in the pulp-strainer may be any desired one.

Having now described my invention, what I desire to secure by a patent of the United States is—

1. In a pulp-strainer having screen-plates and beating-wings for accelerating the passage of the stuff through said plates, the combination with the said wings and plates, of beating-pieces, such as ledges, plates, wings, and the like, arranged near to the axes of said beating-wings, in such a manner, that said beating-pieces are capable of producing in the liquid pulp currents directed parallel to the surface of said beating-wings, for the purpose as described.

2. In a pulp-strainer having screen-plates and beating-wings for accelerating the passage of the stuff through said plates, the combination with the said wings and plates, of beating-pieces, such as ledges, plates, wings, and the like, arranged near to the axes of said beating-wings, in such a manner, that said beating-pieces are capable of producing in the liquid pulp currents directed parallel to the surfaces of said beating-wings; of funnel-shaped apertures, such as holes, slots, intermediate spaces, and the like provided in the beating-wings and directed with their narrow mouths against the screen-plates, for the purpose as described.

3. In a pulp-strainer having screen-plates, and beating-wings for accelerating the passage of the stuff through said plates, the combination with the said wings and plates, of beating-pieces, such as ledges, plates, wings, and the like, arranged near to the axes of the beating-wings, in such a manner, that said beating-pieces are capable for producing in the liquid pulp currents directed parallel to the surfaces of said beating-wings, and of another or other systems of beating-wings located all side by side in one pulp-strainer vat and being driven in such a manner that the interruptions of movement of the stuff brought about by the oscillations of one system are compensated by the simultaneous oscillations of the neighboring system or systems, for the purpose as described.

4. In a pulp-strainer having screen-plates and beating-wings for accelerating the passage of the stuff through said plates, the combination with the said wings and plates, of beating-pieces, such as ledges, plates, wings, and the like, arranged near to the axes of the beating-wings, in such a manner, that said beating-pieces are capable for producing in the liquid pulp currents directed parallel to the surfaces of said beating-wings; funnel-shaped apertures, such as holes, slots, intermediate spaces, and the like, provided in the beating-wings and directed with their mouths against the screen-plates, and of another or other systems of beating-wings located all

side by side in one pulp-strainer vat and being driven in such a manner that the interruptions of movement of the stuff brought about by the oscillations of one system are
5 compensated by the simultaneous oscillations of the neighboring system or systems, for the purpose as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

PAUL REINICKE.

Witnesses:

RUDOLPH FRICKE.

B. H. WARNER, Jr.