

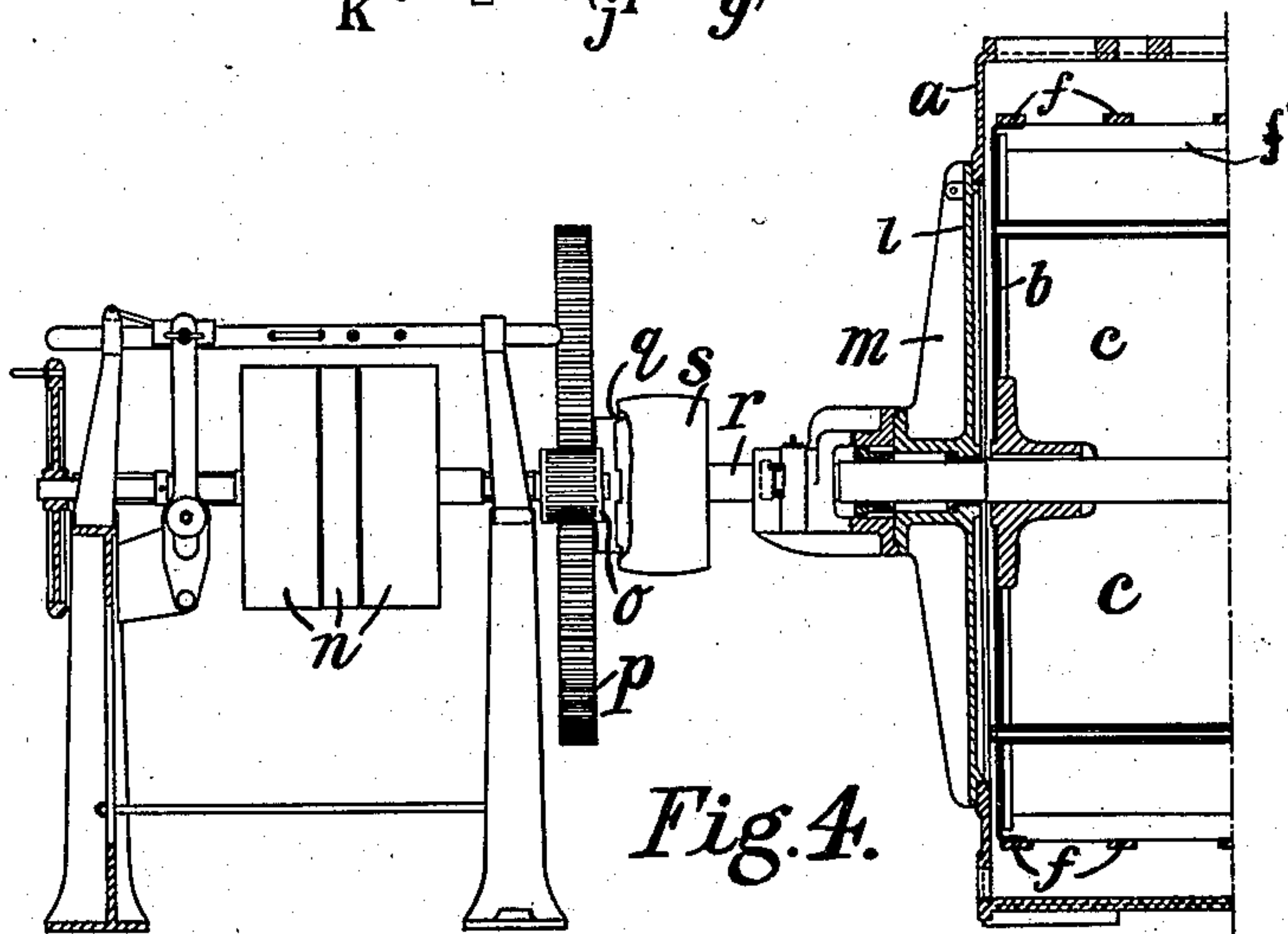
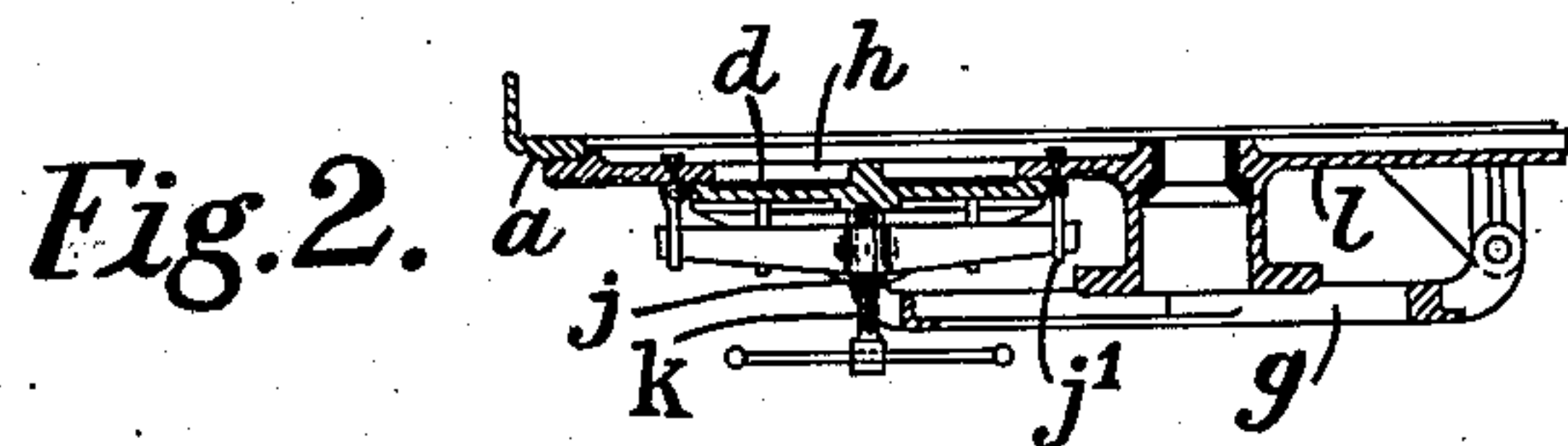
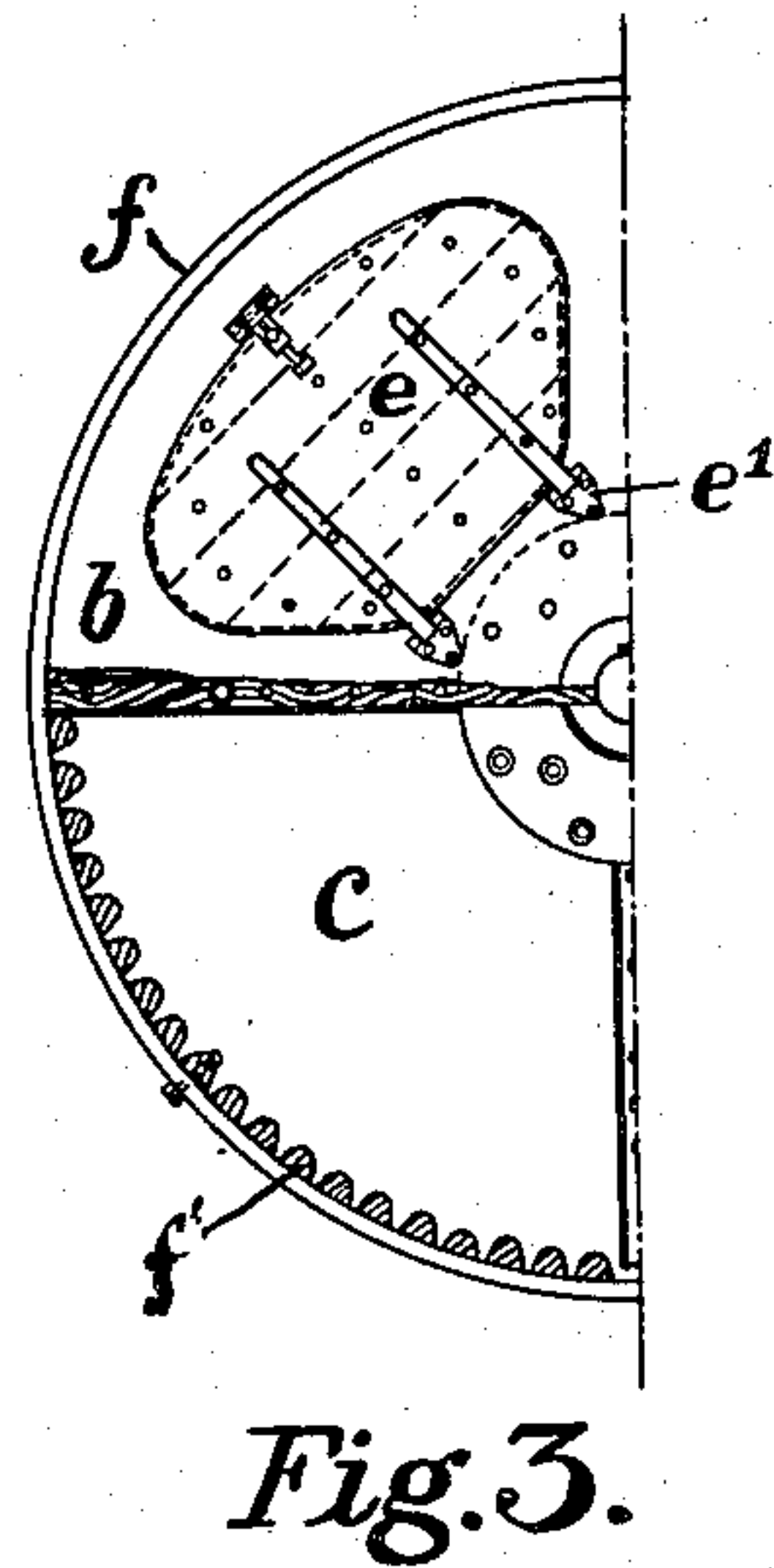
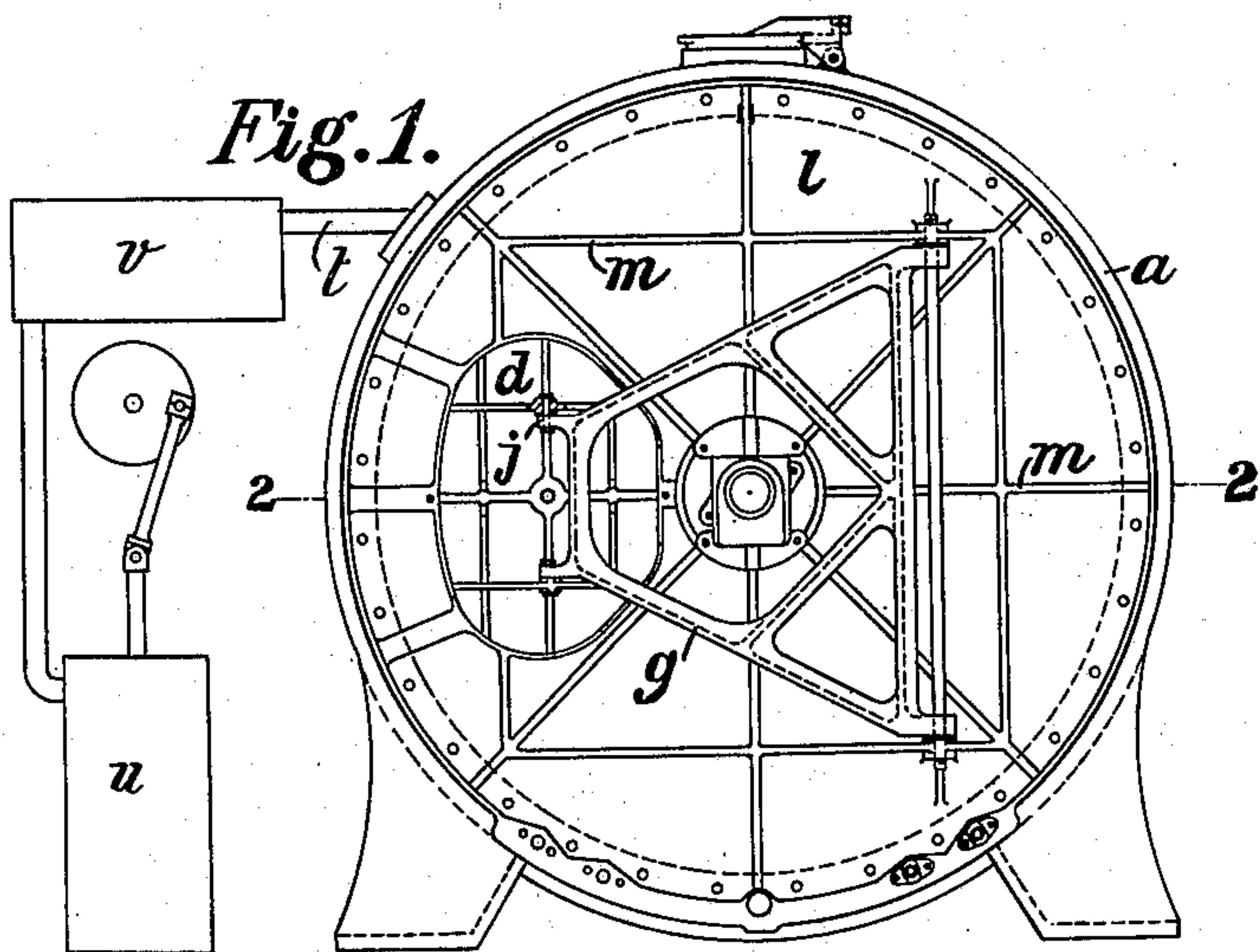
H. HEY.

APPARATUS FOR IMPREGNATING AND EXTRACTING LIQUIDS FROM FABRICS.

APPLICATION FILED NOV. 20, 1907.

923,971.

Patented June 8, 1909.



Witnesses:

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UNITED STATES PATENT OFFICE.

HARRY HEY, OF DEWSBURY, ENGLAND.

APPARATUS FOR IMPREGNATING AND EXTRACTING LIQUIDS FROM FABRICS.

No. 923,971.

Specification of Letters Patent.

Patented June 8, 1909.

Application filed November 20, 1907. Serial No. 402,969.

To all whom it may concern:

Be it known that I, HARRY HEY, a subject of the King of Great Britain, residing at Dewsbury, in the county of York, in the Kingdom of England, chemist, have invented certain new and useful Improvements in or Relating to Apparatus for Washing, Impregnating, Drying, or Extracting Liquids from Fabrics and other Goods, for which application has been made in Great Britain, No. 26,843, dated November 26, 1906.

This invention relates to centrifugal machines, and especially to apparatus for carrying out the processes of impregnating, drying and extracting liquids from fabrics and other goods.

Among the objects of my invention are: to provide an apparatus in which the goods can be first impregnated with a volatile liquid or solvent and then dried under the influence of a vacuum; to provide an apparatus in which the high speed necessary can be obtained without danger to the apparatus, and without detracting from the effects required; to arrange the door of the casing, in which the cage rotates, in such a position that access can easily be had and so that the tendency of the centrifugal force set up by the rapid rotation will keep the doors of the cage closed and thus avoid any twisting action; and to arrange the door of the casing so that it can be moved away quite clear of the orifice which it closes.

In the accompanying drawings: Figure 1 shows a side view of the apparatus as a whole; Fig. 2 is a detail plan view in partial section of the door of the casing and its supports; Fig. 3 is an elevation in partial section of half the cage removed from its casing; and Fig. 4 is an elevation showing half the casing and cage in section, and the gear for rotating the cage at different speeds.

In the drawings, the casing *a* is supported in any suitable manner and held stationary, and contains a rotatable cage *b*, having a number of sector-shaped compartments *c*. The door *d* of the casing is arranged at one end thereof away from the gearing hereinafter referred to, while the door *e* of each compartment of the cage is arranged so as to be capable of being brought opposite the door *d* in the casing. These doors *e* are arranged with their hinges *e'* between their inner edges and the center of the cage, so that said doors will tend to close as the cage rotates. Further, the hinges are arranged

so that the door can turn about a line at right-angles to a diameter of the cage.

f are strengthening bands on the periphery of the cage.

g is a hinged gate, on the casing *a*, which carries the door *d* by means of which the door *d* may be swung away clear of the orifice *h* in the casing.

j is a cross-bar carrying a screw *k* at its center, and adapted to engage with swinging links *j'* on the casing, and by means of the screw *k* to press the door *d* against the casing, and so hermetically close the orifice *h*.

l represents the end of the casing and *m* strengthening ribs thereon.

n is a fast and loose pulley-device, the shaft of which carries a spur-wheel *o* which gears with a further spur-wheel *p*, this spur-wheel *p* carrying one member of a clutch *q*, carried loosely on the shaft *r*, journaled in the casing, the other member of which is carried by pulley *s*, fixed on shaft *r*, to which the cage *b* is fixed so as to journal in the casing.

t is a suitable connection from the casing to a suitable vacuum-pump *u* and *v* represents, diagrammatically, a volatile vapor and air separating device interposed between the pump *u* and the casing.

The cage *b* is divided into the sector-shaped compartments *c*, for the purpose of enabling the fabric, or other goods to be treated, to be substantially uniformly distributed in the cage, this being important since in the rapid rotation of the cage, in the absence of said compartments, the tendency would be to throw the work into a mass at one point in the circumference of the cage and thus unbalance and subject the apparatus to irregular strains and render it liable to accident; also, the work in such mass would not be thoroughly or properly impregnated and could not be properly and thoroughly dried, nor the solvent expelled from the work or the cage. By distributing the work in compartments of the cage, balance of the latter is maintained, impregnation of the work becomes thorough and uniform, the work is quickly dried, and the solvent is completely expelled so that its recovery is complete. The periphery of the cage is, of course, foraminous, rendered so in this instance of my invention by a series of parallel cross-bars *f'* secured to the strengthening bands *f*, and arranged slightly separated to permit the solvent to properly pass in and out under the proper conditions of operation.

By arranging the doors *e*, of the cage-compartments *c*, at the side instead of on the periphery of the cage, the powerful centrifugal force cannot tend to cause them to fly open, but will tend to keep them closed, this being a very important feature in my apparatus; and this arrangement of the doors *e*, in cooperation with the arrangement of the door *d* in the side of the casing, enables the several compartments of the cage to be quickly and handily filled through the casing. This arrangement is rendered still more effective by hanging the door *d* of the casing remote from the orifice *h*, as shown in Figs. 1 and 2, since the said door can be swung clear to one side away from any possibility of interference with the operation of filling the cage through the registering doors *d* and *c*. These various arrangements of parts add the important advantage to the apparatus of enabling it to be driven at much greater speed, because the cage and casing can be made of much larger diameter and shorter axial length. This directly results in the important function of economy in operation, since the cage must always be filled with solvent to a certain predetermined height and the recovery of the solvent is in direct proportion to the speed of the apparatus.

In operation, the goods are placed in the compartment *c* of the cage *b*, through the orifice *h* in the casing, and the clutch-parts *q* and *s* brought into engagement, so that the pulleys *n*, which are rotated from any source of power, will cause the rotation of the cage through the spur-wheels *o* and *p* at a slow speed. This slow speed of rotation of the cage is carried on until the goods are thoroughly impregnated with the liquid, introduced into the casing, then the clutch *q* is disengaged and the shaft *r* rotated directly from the source of power by means of the pulley *s*, whereby a high speed of rotation is set up. When this high speed of rotation is set up, the vacuum-pump *u* is also set in action, so that the casing *a* is placed under a vacuum and the centrifuging therein takes place under vacuum, whereby the drying or extracting of the liquids from the goods is brought about not only by the centrifuging, but also by the liquid being forced out of the goods owing to the vacuum set up.

I declare that what I claim is:

1. In apparatus for impregnating and drying or extracting liquids from fabrics or other goods, a casing, a door at the end of the casing, a rotating cage within the said casing having a plurality of compartments, doors on the end of the said cage arranged one for each compartment so as to register with the door of the casing, and means for rotating the cage.

2. In apparatus for impregnating and drying or extracting liquids from fabrics or other goods, a casing having an orifice at one end, a

bracket hinged on the said casing remote from said orifice, a door on said hinged bracket corresponding to the orifice in said casing, means for clamping said door on the said casing, a rotatable cage within the said casing, doors at the end of said cage for registering with the orifice of the casing, and means for rotating the cage.

3. In apparatus for impregnating and drying or extracting liquids from fabrics or other goods, a casing having an orifice at the end, means for closing the said orifice, a cage rotatable within the said casing, compartments in said cage, a door at the end of each of the said compartments, for registering with the orifice of the casing, hinged so as to turn about lines at right-angles to the diameter of the cage, and means for rotating said cage.

4. In apparatus for impregnating and drying or extracting liquids from fabrics or other goods, a casing having an orifice at one end, means for tightly closing the orifice in said casing, a cage rotatable within the said casing, doors at the end of said cage for registering with the orifice of the casing, hinges turning about lines at right-angles to the diameter of the cage for holding the doors on the cage and arranged on the side of the doors nearest the center of the cage.

5. In apparatus for impregnating and drying or extracting liquids from fabrics or other goods, a casing, a door at the end of the casing, a rotating cage within the said casing having a plurality of compartments, doors on the end of the said cage arranged one for each compartment so as to register with the door of the casing, means for rotating said cage, and means connected to the casing tending to produce a vacuum therein whereby the work is impregnated and the solvent expelled under the influence of centrifugal force and a vacuum.

6. In apparatus for impregnating and drying or extracting liquids from fabrics and other goods, a casing, a door at the end of the casing, a rotating cage within the said casing having a plurality of compartments, doors on the end of the said cage arranged one for each compartment so as to register with the door of the casing, means for rotating said cage at two different speeds, and means connected to the casing tending to produce a vacuum therein, whereby the work in the cage is thoroughly impregnated during the rotation thereof at one speed and the solvent is expelled from the cage during the rotation thereof at another speed and also under the influence of a vacuum.

In witness whereof, I have hereunto signed my name this 6th day of November 1907, in the presence of two subscribing witnesses.

HARRY HEY.

Witnesses:

ARTHUR HAINSWORTH,
SARAH SENIOR.