

**No. 617,502.**

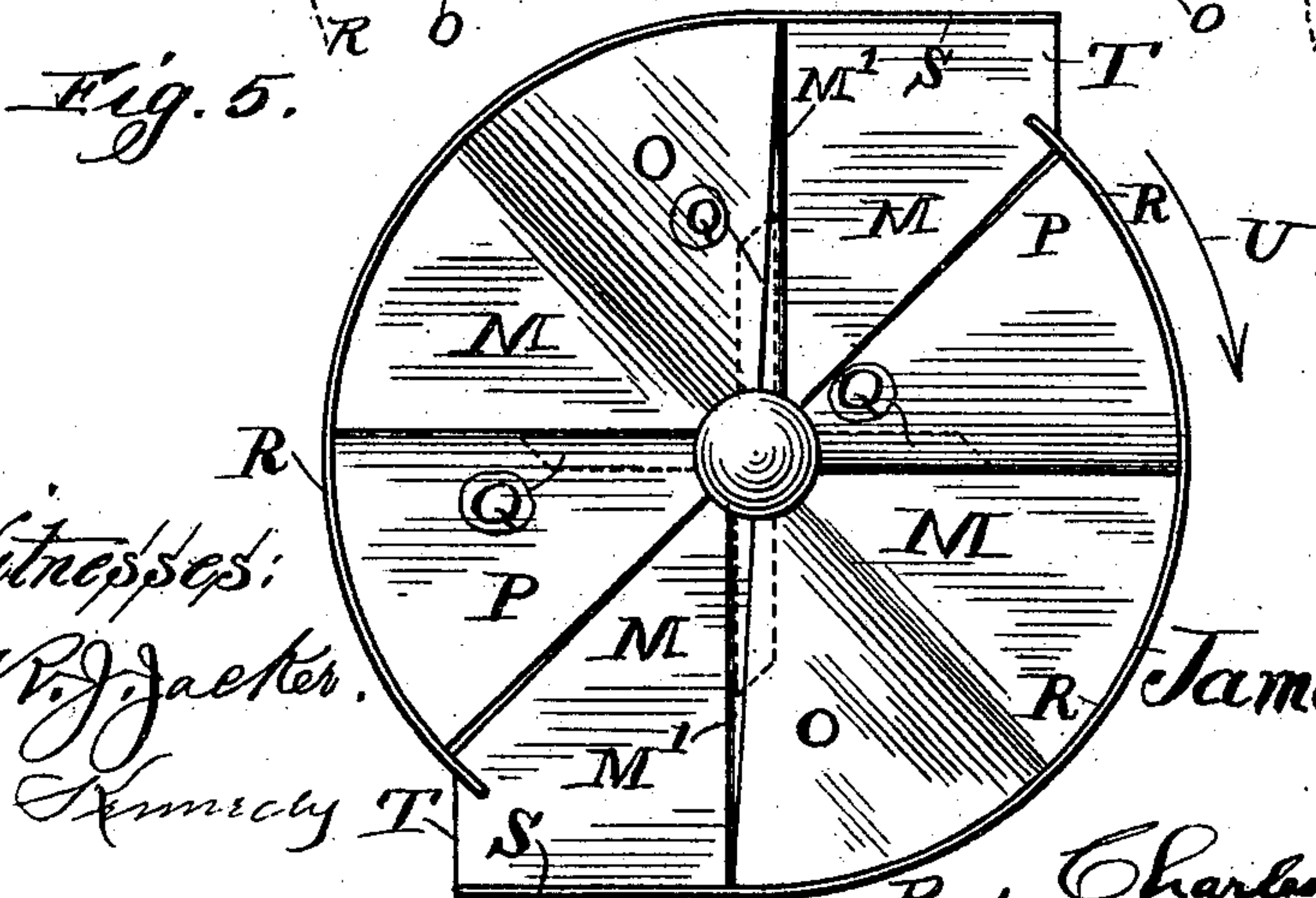
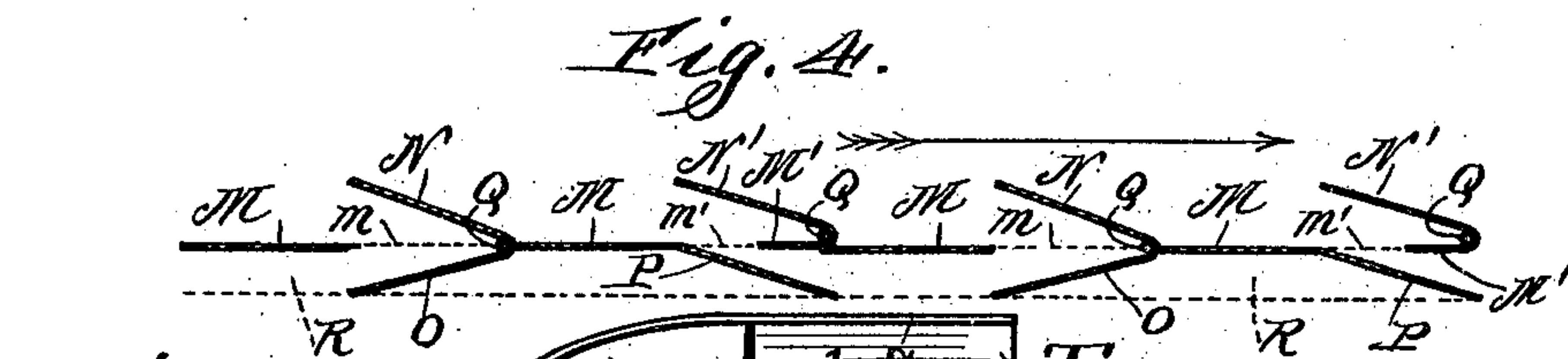
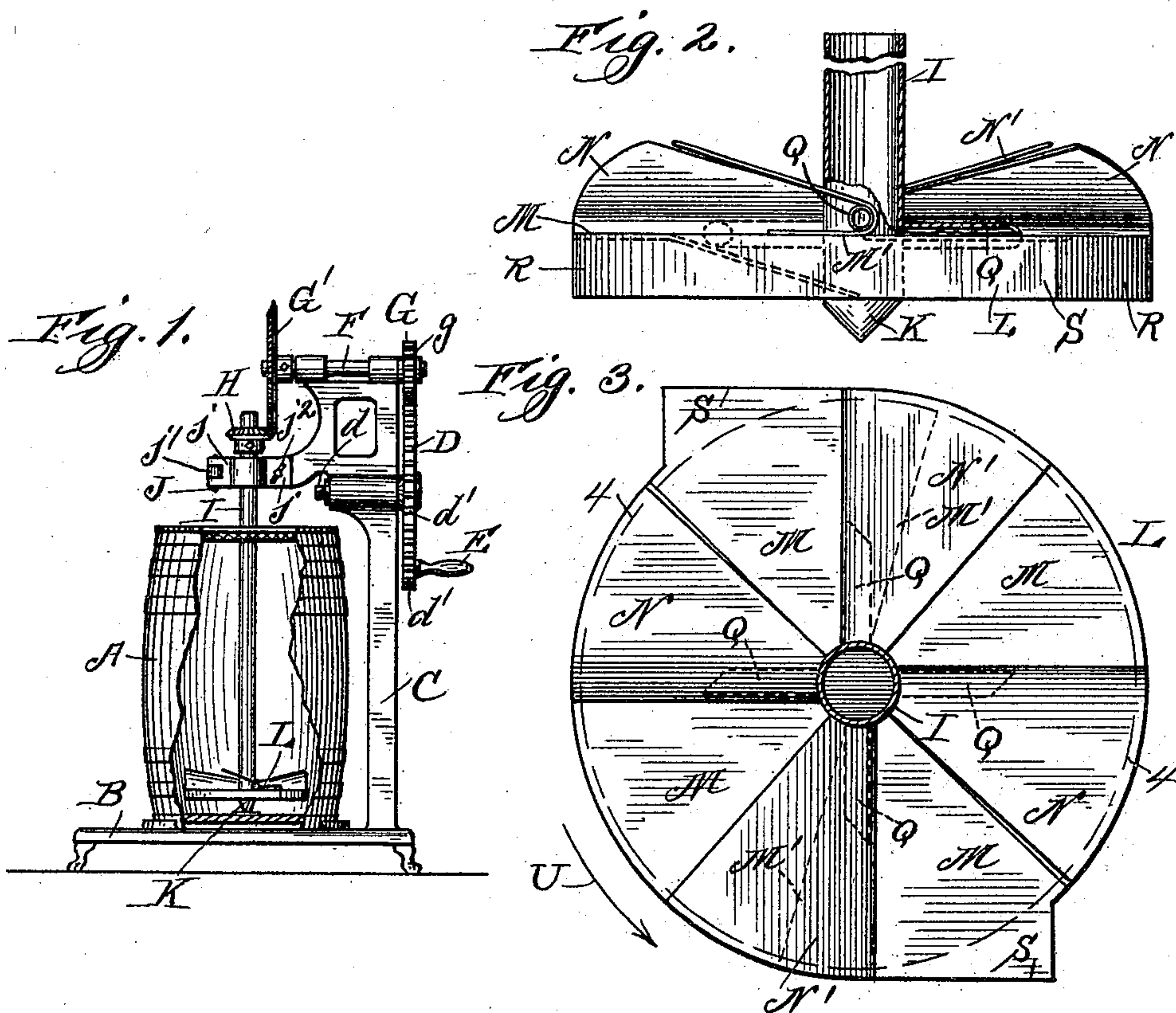
**Patented Jan. 10, 1899.**

**J. H. FOLLIOTT.**

**CHURN,**

(Application filed June 2, 1898.)

(No Model.)



Witnesses:

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# UNITED STATES PATENT OFFICE.

JAMES H. FOLLIOTT, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO  
CHARLES B. FRASER, OF SAME PLACE.

## CHURN.

SPECIFICATION forming part of Letters Patent No. 617,502, dated January 10, 1899.

Application filed June 2, 1898. Serial No. 682,329. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES H. FOLLIOTT, a resident of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Aerating Butter-Separators and Liquid-Agitators, of which the following, when taken in connection with the drawings accompanying and forming a part thereof, is a full and complete description.

The object of this invention is to obtain an apparatus of the kind named, whereby when any liquid is placed in the receptacle of the apparatus and the apparatus is operated the liquid will be well agitated and aerated by air which will be discharged into the body of the liquid.

The principal purpose for which the apparatus embodying this invention is used is the separation of butter from cream; but the apparatus is equally well adapted for the agitation and aerating of whisky and other alcoholic or other liquids.

In the drawings referred to as illustrating the apparatus embodying this invention, Figure 1 is an elevation of such apparatus with a portion of the front side of the liquid-receptacle of the apparatus removed to expose to view the agitator and shaft in elevation; Fig. 2, an elevation of the agitator and aerator of the apparatus and a vertical sectional view of the lower end of the shaft on which such agitator and aerator is mounted to turn with the shaft, such view and also Figs. 3, 4, and 5, hereinafter described, being on an enlarged scale from Fig. 1. Fig. 3 is a top plan view of the agitator and aerator illustrated in Fig. 2, showing the vertical shaft on which such agitator and aerator is mounted in horizontal cross-section; Fig. 4, a horizontal sectional view of the agitator and aerator on broken line 4 4 of Fig. 3, unrolled; and Fig. 5, a bottom plan view of such agitator and aerator, showing the lower end of the vertical shaft on which it is mounted.

A is a receptacle into which the liquid desired to be agitated and aerated is placed.

B is a base on which receptacle A is placed and to which it may well be secured.

C is a standard mounted on base B, in

which standard the movable parts of the apparatus are journaled.

D is a driving-wheel mounted on rotatably-mounted shaft *d*. Shaft D is journaled in standard C. Driving-wheel D has, preferably, gear-teeth *d'* *d'* thereon.

The apparatus being particularly well adapted for the separating of butter from cream by hand-power, because of the little power or force required to operate the apparatus, I have shown handle E on wheel D, by which the apparatus may be operated; but any power may be used to operate the machine.

F is a shaft rotatably journaled in standard C, and G is a wheel secured on shaft F, having teeth *g g* intermeshing with gear-teeth *d'* *d'* on wheel D.

G' is a gear-wheel secured on shaft F, the teeth whereof intermesh with the teeth on gear-wheel H. I is a hollow shaft journaled on the upper end thereof in journal-bearing J on standard C and at the lower end thereof stepped at K on the bottom of the receptacle A. Journal J may be constructed by hinging part *j* at end *j'* thereof to standard C and securing the other end of such part *j* to standard C, as by thumb-nut *j*<sup>2</sup>.

L is the agitator and aerator of the apparatus.

The principal invention embodied in this apparatus is found in the agitator and aerator L, and for that reason such agitator and aerator is well illustrated in the drawings and will now be described in detail.

M M' is a disk secured to hollow shaft I and rotating in a substantially horizontal plane.

*m m' m m'* are openings through the disk M M', such openings extending radially from the hollow shaft I to the periphery of the disk.

N N', N N', and O O are radial wings or blades secured or joined at their forward edges, respectively, to the disk M M'.

P P are radial wings or blades joined at their rear edges, respectively, to the disk M M' and at their forward edges in a plane below such disk. Blades N N are on the upper side of disk M M', the rear edges thereof being in a plane above the disk and from such



edges extending forward and downward to the disk and to the line of joining. Blades O O are below disk M M', their rear edges being below the plane in which the disk is placed.

5 Blades N and O meet and are joined to the disk M M' at the forward edge of opening *m* through the disk, and blades N' and P are respectively above and below the opening *m'*, the rear edge of blade P being joined to the  
10 disk at the rear edge of the opening and the forward edge of blade N' being joined to the disk a short distance forward of the front edge of such opening *m'*, leaving a portion of the disk (the part lettered M') between such forward edge of opening *m'* and the forward edge  
15 of such blade.

Q Q Q Q are horizontal pipes extending radially outward from the vertical hollow shaft I, such pipes communicating with and dis-  
20 charging air therefrom into the body of the liquid contained in the receptacle A when the apparatus is being operated.

R is a vertical rim of the agitator and aerator L, such rim extending peripherally around the disk M M', except at the parts S S thereof, where it is extended tangentially to the periphery of such disk. Disk M M', adjacent to such tangentially-extended part of rim R, is extended to such rim, thereby obtaining  
25 mouth T in rim R, through and by which in the operation of the apparatus and consequent rotation of the disk liquid is gathered underneath the agitator and aerator L.

A discharge-pipe Q is placed between the radial blades N O adjacent to the forward and meeting edges thereof, such pipe discharging air from the hollow shaft I about midway of the distance from the center of the agitator and aerator and the periphery thereof.  
35

40 The radial wings or blades N' N' are substantially like the wings or blades N N; but the blades or wings N' N' join, at the forward edges thereof, respectively, to the disk M M' some distance forward of the openings *m' m'*, leaving the parts M' M' of the disk between the forward and joining edges of such blades or wings N' N' and such openings. Discharge-pipes Q Q are placed also between the radial  
45 blades N' N' and parts M' M' of the disk, respectively, discharging air from the hollow shaft I about midway of the distance from the center of the agitator and aerator and the periphery thereof.

The radial wings P P are joined at the rear edges, respectively, to disk M M', back of the openings *m' m'* in such disk, the forward edges of such radial wings being below the disk and in position to divert or direct liquid from below the disk upward through open-  
50 ings *m' m'* to above the disk when the disk is rotated.

U, Figs. 3 and 5, are arrows indicating the direction in which the agitator and aerator rotates when the apparatus is in operation.

65 The manner of operating this apparatus—say in the separating of butter from cream—is substantially as follows: On turning the

agitator and aerator L in the direction indicated by the arrow U in Fig. 3 the cream, through or in which such agitator and aerator  
70 is moving resting on the several radial blades or wings N N', is raised, the cream against which the radial blades or wings O O are forced is depressed, the cream against which the radial blades or wings P P are forced or some  
75 thereof is forced up through the openings *m' m'*, respectively, and the cream in front of the mouths T T is gathered underneath such agitator and aerator. A vacuum or a partial vacuum is thus formed between radial blades or  
80 wings N O and also between the radial blades or wings N' and parts M' M' of disk M M', respectively, into which vacuum or partial vacuum air is discharged from the open ends of the several pipes Q Q. The air so supplied is  
85 drawn down the hollow shaft I, which is open at the top, as is illustrated in Fig. 2 of the drawings. The discharge of such air into the several vacuums or partial vacuums, as above stated, in my opinion is assisted by the cen-  
90 trifugal force operating on the air contained in the several radial pipes Q Q. The air thus discharged into the several vacuums or partial vacuums in my opinion becomes thoroughly mixed with the cream falling over the  
95 raised edges of the radial wings or blades N N' and rising from the depressed edges of the radial wings or blades O O, respectively, as well with the cream ascending through the openings *m' m'* and, if any, through the  
100 openings *m m*. A part of the air discharged between the radial wings or blades N O will be mixed with the cream above the several horizontal tables of the agitator and aerator and a part thereof with the cream below such  
105 horizontal tables.

I do not confine myself to the exact number of horizontal tables and openings shown in the agitator and aerator illustrated or to the exact number of radial wings or blades  
110 disposed in the exact order illustrated and hereinbefore described, as it is evident that in a large apparatus the number of all the several wings or of some thereof may be increased without departing from the spirit of  
115 this invention, which is contained in the apparatus constructed and operated in the manner hereinbefore described without reference to the number of duplicate parts therein contained.

I have found in practice that an improved apparatus is obtained where additional parts M' M' and openings *m' m'* are substituted in disk M M' for the radial blades or wings O O; but I prefer that the agitator and aerator be  
125 supplied with such radial blades or wings O O.

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

1. The combination, in a liquid agitator and  
130 aerator, of a hollow shaft rotatably mounted, a disk secured to the shaft, such disk having openings therethrough, radial blades converging toward and at their forward edges



joined, respectively, to the disk forward of the openings therethrough, pipes secured in the hollow shaft and communicating therewith and extending radially therefrom, such  
5 pipes discharging between the radial blades and the disk and between the shaft and the periphery of the disk; substantially as described.

2. The combination, in a liquid agitator and  
10 aerator, of a hollow shaft rotatably mounted, a disk secured to the shaft, such disk having openings therethrough, a peripheral rim to the disk, such rim having openings therein, tangential extensions to the peripheral rim  
15 forming mouths to the openings therein, radial blades converging toward and at their forward edges joined, respectively, to the disk, forward of the openings therethrough, pipes secured to the hollow shaft and com-  
20 municating therewith and extending radially therefrom, such pipes discharging between the radial blades and the disk and between the shaft and the peripheral rim, and means to rotate the shaft; substantially as described.

25 3. The combination, in a liquid agitator and aerator, of a hollow shaft rotatably mounted, a disk secured to the shaft, such disk having openings therethrough, a peripheral rim to the disk, such rim having openings therein,  
30 tangential extensions to the peripheral rim, forming mouths to the openings therein, radial blades arranged with their rear edges, respectively, joined to the disk to direct liquid from beneath the agitator and aerator  
35 upward through the openings in the disk, radial blades converging toward and at their forward edges joined with the disk, forward

of the openings therethrough, pipes, located within the angle formed by the converging blades and the disk, extending radially from  
40 the hollow shaft and discharging between such converging blades and disk and between the hollow shaft and the peripheral rim, with means to rotate the shaft; substantially as described.

45 4. The combination, in a liquid agitator and aerator, of a rotatably mounted hollow shaft, a disk secured to the shaft, such disk having openings therethrough, a peripheral rim to the disk, such rim having openings therein,  
50 tangential extensions to the peripheral rim, forming mouths to the openings therein, radial blades arranged with their rear edges, respectively, joined to the disk to direct liquid from beneath the disk upward through  
55 certain of the openings through the disk when the shaft and disk are rotated, radial blades above the disk converging toward and at their forward edges, respectively, joined to the disk forward of such openings converging  
60 pairs of radial blades meeting at their forward edges and joined to the disk forward of the remaining openings therethrough, pipes, located between the converging blades and  
65 between the blades and disk, respectively, such pipes secured in and extending radially from the hollow shaft and discharging between the hollow shaft and the peripheral rim, and means to rotate the shaft and disk; substantially as described.

JAMES H. FOLLIOTT.

In presence of—

CHARLES B. FRASER,  
WILLIAM W. ANGEL.