

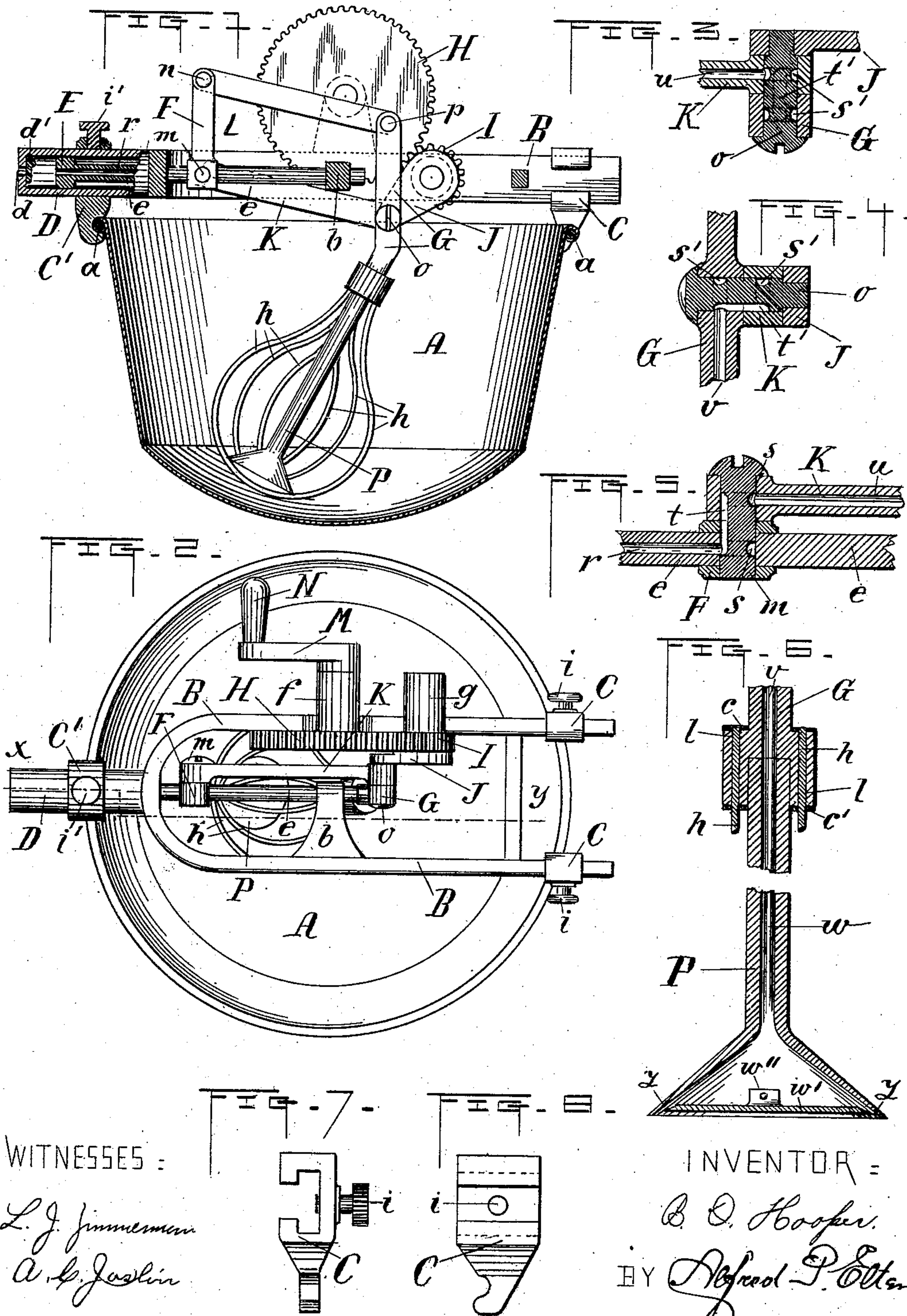
**No. 708,229.**

**Patented Sept. 2, 1902.**

**B. D. HOOPER.**  
**AERATING AGITATOR.**

(Application filed Oct. 8, 1901.)

(No Model.)



INVENTOR =

B. D. Hooper.

BY Alfred I. Eaton

ATTORNEY



# UNITED STATES PATENT OFFICE.

BEEKMAN D. HOOPER, OF JAMAICA, NEW YORK.

## AERATING-AGITATOR.

SPECIFICATION forming part of Letters Patent No. 708,229, dated September 2, 1902.

Application filed October 8, 1901. Serial No. 78,018. (No model.)

*To all whom it may concern:*

Be it known that I, BEEKMAN D. HOOPER, a citizen of the United States, residing at Jamaica, in the county of Queens and State of New York, have invented certain new and useful Improvements in Aerating-Agitators, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation, partly in section, on line  $x y$ , Fig. 2. Fig. 2 is a plan view of an aerating-agitator. Figs. 3, 4, 5, and 6 are sectional views of parts having air-passages. Fig. 7 is an end view, and Fig. 8 is a side view, of one of the clamps.

My invention relates to that class of agitators by means of which a more or less predetermined quantity of air, carbonic-acid gas, or any other gas is brought into intimate contact with a certain substance or a mixture of substances while and during the agitating and mixing of the latter, so that the resulting mass may not only be thoroughly and homogeneously mixed, but also attain the desired consistency, especially as to greatly-increased bulk.

The object of my invention is to furnish a device of this description which will accomplish the wished-for result satisfactorily and in considerably less time than it is possible with other apparatus of this nature, which is simple in construction and in the handling of same, which is easily cleansed, and which in point of cost is comparatively inexpensive.

To this end the invention consists in certain novel features of construction, combination, and arrangement of parts, as will be hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, in which like symbols of reference indicate like parts in the several figures or wherever used throughout this specification, A is a receptacle on which is a supporting-frame B, held there in proper position by three adjustable sliding clamps C, C, and C'. This frame carries at one end an air-pump cylinder D, the head of which is provided with an air-inlet opening  $d$

and a valve  $d'$  for closing said opening. In this cylinder D operates a piston E, whose piston-rod  $e$  at its farther end is guided at  $b$ . Rigidly secured to this piston-rod  $e$  is a lever-arm F, preferably at right angles to the same. This arm F carries at its lower and upper ends pins  $m$  and  $n$ , respectively.

Supported in suitable journal-bearings  $f$  and  $g$ , forming part of frame B, Fig. 2, are two gear-wheels H and I, of which gear H receives its motion through the medium of crank M and handle N, while rigidly connected to gear I is a crank J. Crank-pin  $o$  of the latter carries pivotally the agitating and aerating member, which consists of arm G, a plurality of wire loops  $h h h$ , the ends of which are introduced into holes  $l l$ , drilled into the lower part of arm G, Fig. 6, and held there securely by a layer of solder at  $c$  and  $c'$  preferably, and air-nozzle P, which also is held in proper position by the lower part of arm G. The lower trumpet-shaped opening of air-nozzle P carries a disk  $w'$ , held in place by two or more lugs  $w''$ , in this manner providing for an annular aperture  $z z$ . Crank-pin  $o$  and pin  $m$  are pivotally connected by arm or connecting-rod K, while pin  $n$  is pivotally connected with pin  $p$ , which latter is carried by arm G, by arm or auxiliary connecting-rod L.

In Fig. 2 arm L and pins  $n$  and  $p$  have been omitted to better show the other parts. From the aforesaid it will be seen that on turning crank M by means of handle N not only is reciprocating motion imparted to the piston E of the air-pump and the latter thereby operated, but the agitator or beater is also caused to operate and that in a preferably vertical, or nearly so, plane and in such a manner that every point or part of the agitator describes a circle of the same diameter and in the same direction as the circle described by the center of the crank-pin  $o$ . This is accomplished by the arrangement, as shown, of the four arms F, G, K, and L, the oppositely-disposed ones of which are always parallel, or nearly so, to one another, no matter what the position of crank J may be. During the suction-stroke of piston E air is drawn into the pump-cylinder D through opening  $d$  past valve  $d'$ . During the following or compres-



sion stroke the air confined in cylinder D is forced into the passage *r* of piston-rod *e*, Figs. 1 and 5, then through the annular grooves *s s* and the connecting-groove *t* on pin *m*, Fig. 5, into the passage through or along connecting-rod K. From there the air passes through the grooves *s'*, *t'*, and *s'* on crank-pin *o*, Figs. 3 and 4, into the passage *v* of lower part of arm G and passage *w* of air-nozzle P, Fig. 6, to leave the latter through the annular aperture *z*. The annular grooves *s'* *s* on crank-pin *o* and pin *m* are arranged oppositely to and coinciding with the air-passages *r*, *u*, and *v* and are connected by means of the short grooves *t' t*, as shown in Figs. 3, 4, and 5.

To operate the aforescribed device after the substances to be aerated and "beaten" are placed in the kettle or other container, the former is adjusted in a proper position on top of kettle by means of the clamps C, C, and C', the lower ends of which engage with the "wire-bound" rim *a* of the kettle A. After tightening set-screws *i*, *i*, and *i'* of the said clamps the apparatus is then firmly held in place. These clamps C, C, and C' are arranged so that they may slide freely on the ends of frame B and the air-pump cylinder D, respectively. On turning handle N the mass in the kettle is thoroughly agitated, and at the same time air is forced into the latter, while the air-nozzle and the agitating wire loops describe the lower part of their circular motion or sweep. The greater part of the air will be forced into the mass to be agitated during the first half of the upward stroke of arm G, when the wire loops and the air-nozzle more or less throw or lift the mass upward, the air from the air-nozzle meeting the mass on the latter descending again. It is this function of my apparatus, as described, and which I have found experimentally to give the best result in thoroughly aerating masses in a minimum of time—as, for instance, in "beating up" eggs or the white of eggs alone or with sugar or other substances for use in bakeries and confectioneries for a variety of purposes, culinary and otherwise—which I consider superior to the operation of all other agitators known to me. The agitation of the mass by wire loops rapidly gyrating or describing circles in a vertical, or nearly so, plane, each wire loop free to move like a spring regardless of all other loops, thereby thoroughly subdividing the mass, and the air being injected into the mass also in a subdivided state and under a slight pressure and in such a manner as to compel the globules of air to penetrate part of the mass, an incorporation of the globules of air with particles of the mass is thereby greatly facilitated and a thorough aerating or carbonating of the mass is quickly and readily obtained.

From the foregoing it is evident that other substances than those mentioned may be treated, aerated, or carbonated, or charged with other gases or vapors, and I therefore

do not wish to confine myself to any substance or substances. I also do not confine myself to the precise mechanical details shown and described—as, for instance, the means of imparting motion to crank J, the mode of securing the wire loops, and the form of the nozzle.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. In an aerating-agitator, the combination with the agitating member thereof, and means for bodily gyrating the same in a vertical, or nearly so, plane, of means for forcing air, or any other gas, into the mass to be agitated, during the motion of the agitated member, substantially as, and for the purposes, described.

2. In an aerating-agitator, the combination with a supporting-frame, of a wheel mounted thereon, a framework of arms pivoted together and forming a parallelogram, means for imparting motion from said wheel to the parallelogram, whereby the angles of said arms with respect to each other are altered, a pump, means for imparting motion from said framework to the pump, an agitating member carried by said framework, and means for supplying pressure from said pump to said agitating member substantially as described.

3. In an aerating-agitator the combination with the air-pump cylinder of a hollow piston and piston-rod, a hollow connecting-rod, a pin pivotally connecting the said rods provided with two annular grooves and a connecting-groove, a crank, a crank-pin provided with two annular grooves and a connecting-groove, a hollow agitator-arm, a hollow air-nozzle, and means for imparting motion to the said crank, substantially as described.

4. In an aerating-agitator, the combination with any suitable support, of a framework forming a parallelogram and having the contacting ends of all its arms pivoted together, said framework being mounted upon said support, a pump connected with said framework, means for imparting motion to said framework, whereby the angles of said arms are altered with respect to each other for operating said pump, an agitator member carried by one of the arms of said framework, and means for communicating pressure from said pump to said agitator member, substantially as described.

5. In a mechanism of the class described, the combination with a suitable support, of a crank pivotally mounted thereon, means for rotating said crank, an agitating member pivoted to said crank, means for guiding said member in its movement while following the crank, whereby said agitating member will be directed in a bodily, vertically rotatory or gyrating movement, and means for supplying atmosphere to the lower end of said member during operation thereof, substantially as described.



6. An aerating-agitator, comprising a suitable supporting-frame, a pump mounted thereon, a pinion carried by said frame, a crank operated thereby, an agitator member  
5 pivotally secured to said crank, means connecting said pump with said crank, means for rotating said pinion, and means of communication from said pump with said agitator member, whereby rotation of said pinion  
10 will gyrate said agitator member and supply

gas under pressure thereto, substantially as described.

In testimony whereof I affix my signature, in the presence of two subscribing witnesses, this 3d day of October, A. D. 1901.

BEEKMAN D. HOOPER.

Witnesses:

LAWRENCE J. ZIMMERMAN,  
A. C. JOSLIN.