

No. 856,619.

PATENTED JUNE 11, 1907.

J. M. CAMP & W. AHLEN.

SHAKING MACHINE.

APPLICATION FILED NOV. 28, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

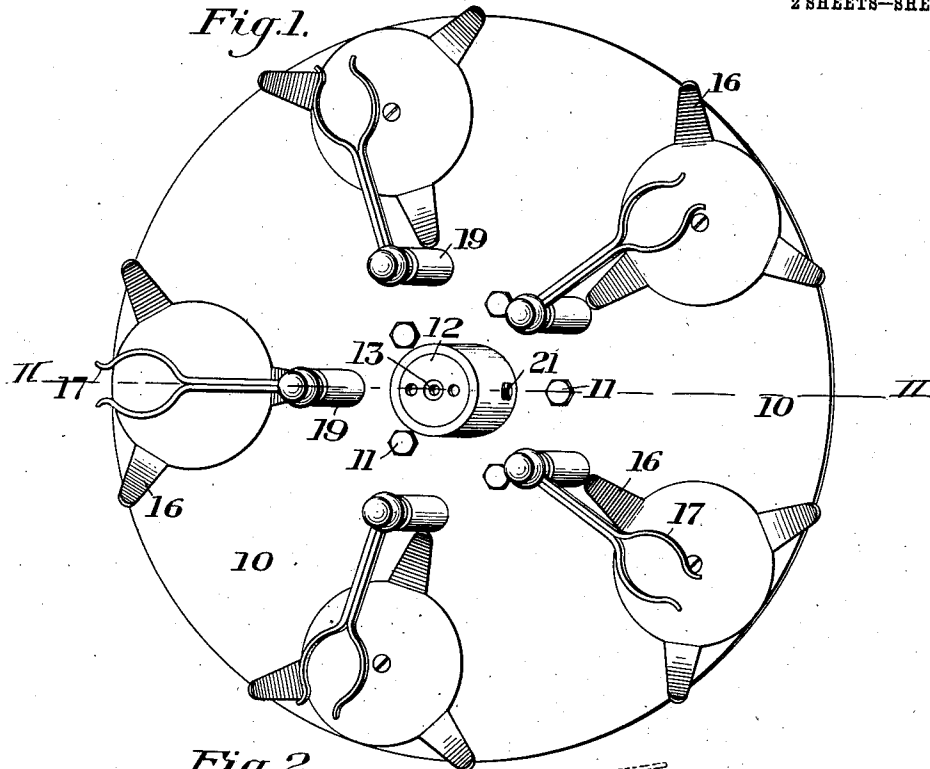
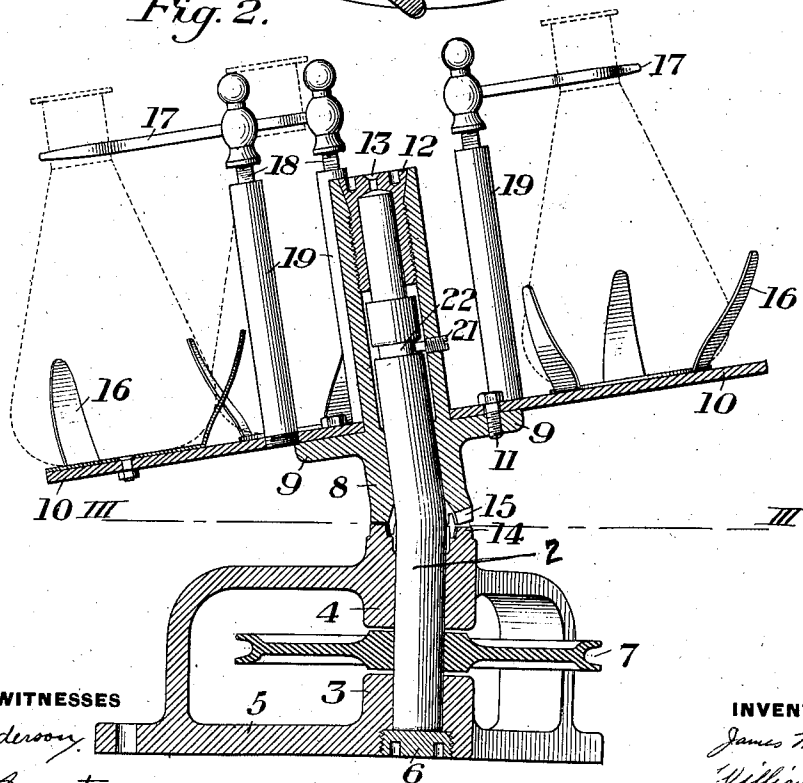


Fig. 2.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 3.

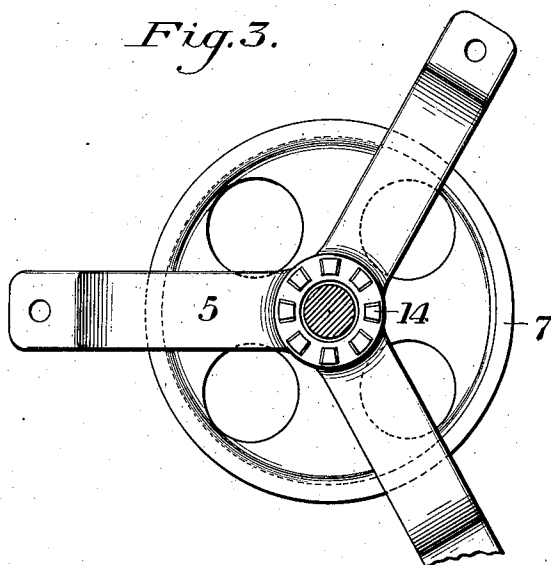
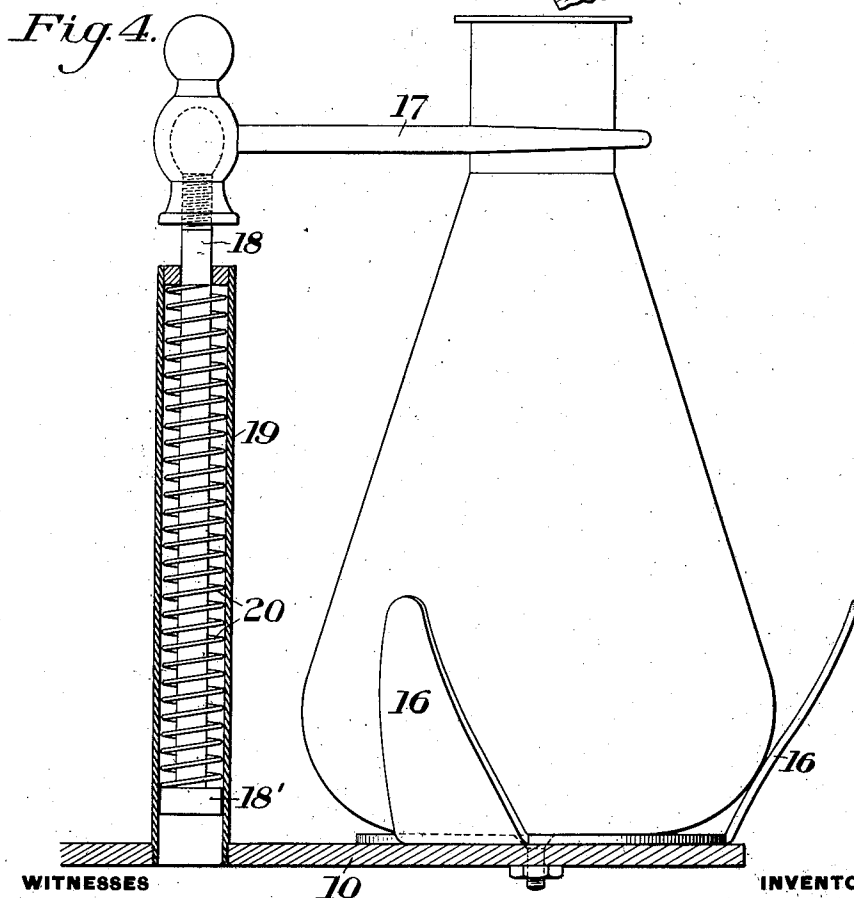


Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

JAMES M. CAMP, OF PITTSBURG, AND WILLIAM AHLEN, OF DUQUESNE,
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SHAKING-MACHINE.

No. 856,619.

Specification of Letters Patent.

Patented June 11, 1907.

Application filed November 28, 1906. Serial No. 345,498.

To all whom it may concern:

Be it known that we, JAMES M. CAMP, of
Pittsburg, Allegheny county, Pennsylvania,
and WILLIAM AHLEN, of Duquesne, in the
county and State aforesaid, have invented a
new and useful Shaking-Machine, of which
the following is a full, clear, and exact description,
reference being had to the accompanying drawings,
forming part of this specification, in which—

Figure 1 is a plan view and Fig. 2 is a sectional
elevation on the line II—II of Fig. 1, showing
our improved apparatus. Fig. 3 is a horizontal
sectional view on the line III—III of Fig. 2
and Fig. 4 is a detail view showing one form
of the vessel holding mechanism.

In many of the various analytical methods
practiced in chemical laboratories, when dissolving
or precipitating one substance in another such as
a solid in a liquid, a necessary step in such
methods is to frequently agitate the solutions by
shaking the containing vessels. Heretofore this
has been accomplished by manual labor, the
attendant successively shaking the vessels until
the chemical reaction is completed, the shaking
operation requiring the entire attention of the
attendant.

Our invention is designed for use in such
laboratories and the object of the invention is
to provide improved mechanism by which these
shaking operations are performed by mechanical
means, without requiring the attention of the
attendant, thereby facilitating and reducing the
cost of such operations.

In the drawings, 2 represents a bent shaft
having a straight lower portion which is rotatably
mounted in the vertical bearings 3, 4 on the tripod
or base 5 of the apparatus. A hardened steel
plug 6 is adjustably secured in the lower end
of the bearing 3 to support and take the end
thrust upon the lower end of the shaft. Secured
to the bent shaft 2, at a point midway between
the bearings 3, 4 is a pulley 7 for driving the
apparatus, the pulley being positively driven by
means of a belt which is connected to any desired
type of motor.

The upper portion of the bent shaft 2 is
provided with a loose table bearing 8 having a
circular flange or disk portion 9 to which the
table or disk 10 is secured by means of tap bolts
11 or otherwise as desired. The upper end of
the table-bearing 8 is provided

with an adjustable bearing plug 12 which
contacts with the upper end of the bent shaft
2 and supports the weight of the apparatus
carried by the table-bearing 8. For lubricating
the table-bearing, we provide the opening 13 in
the end of the plug 12. The upper end of the
bearing 4 is provided with a series of teeth 14
which mesh with a similar series of teeth 15
on the lower end of the table bearing 8 and
serve to prevent the table bearing 8 and table
10 from rotating when the shaft 2 is revolved
in its bearings 3, 4 by the power driven pulley 7.

Mounted on the table 10 is a series of nests
having sets of upwardly and outwardly extending
fingers 16 which engage with and retain the
base portions of the vessels containing the
solutions to be agitated or shaken, in position
on the table. Above each set of fingers 16 is
a spring clamp 17 which is preferably made
vertically adjustable, as shown. The clamp 17
is secured to the squared post 18, the post 18
being mounted in the vertical hollow guide 19
which is rigidly secured in place on the table
10. The upper end of the hollow guide 19 is
closed, a suitable opening being provided in the
end of the guide for the squared post 18. The
lower end of the post 18 is provided with a
flange 18' and a helical spring 20 is interposed
between this flange 18' of the post 18 and the
closed upper end of the hollow guide 19 so as
to permit the spring clamp 17 and post 18 to be
moved vertically. To retain the table in place
on the bent shaft 2 and prevent its being lifted
from the shaft 2 a set-screw 21 is provided in
the table-bearing 8 which extends through the
side of this bearing into the groove 22 in the
bent shaft 2.

In the operation of the apparatus, the
attendant places the vessels containing the
solutions to be shaken on the table 10, the
base portions of the vessels being retained in
place by the fingers 16 and the upper end of
the vessels being held by the vertically adjustable
clamp 17. The motor is then started and the
bent shaft 2 is caused to rotate in its bearings
3, 4. It will be noted that while the shaft 2
is rotated, the table 10 does not revolve, rotation
being prevented by the engaging teeth 14, 15
on the inner ends of the table-bearing 8 and
shaft-bearing 4. The table, however, moves
through a curved or orbital path and rocks or
tilts during such movement. This gives a
gyratory motion

to the contents of the flasks best suited to assist in the dissolution of the materials in the flasks, without danger of spilling.

The advantages of our invention will be apparent to those skilled in the art to which it is applied. By its use the shaking or agitating of the solutions contained in the vessels is easily and quickly accomplished without requiring attention of the operator. The apparatus is simple and easily kept in repair.

The spring clamps 17 may be rigidly secured to the table 10 instead of being made vertically adjustable as shown. The number of vessels mounted on the apparatus may be varied and other modifications in the construction and arrangement of the parts may be made without departing from our invention.

We claim:—

1. A shaking machine comprising a plurality of liquid holding vessels, a table for said vessels, a bent shaft on which said table is loosely mounted, means for rotating said shaft and connections arranged to prevent rotation of the table, substantially as described.

2. A shaking machine comprising a liquid holding vessel, a table for said vessel, means for holding said vessel on the table, a bent shaft on which the table is mounted and means for rotating said shaft; substantially as described.

3. A shaking machine comprising a plurality of liquid holding vessels, a table for said vessels, connections arranged to prevent rotation, means for holding said vessels on the table, a bent shaft on which said table is mounted and means for rotating said shaft; substantially as described.

4. A shaking machine comprising a liquid holding vessel, a table on which said vessel is removably mounted, a bent shaft on which said table is secured, a vertical bearing for said shaft, means for rotating said shaft and mechanism by which rotation of said table is prevented; substantially as described.

5. A shaking machine comprising a liquid holding vessel, a table on which said vessel is removably secured, a bent shaft on which said table is loosely mounted, a vertical bearing for said shaft, means for rotating said shaft and gear teeth by which rotation of said table is prevented; substantially as described.

6. A shaking machine comprising a liquid holding vessel, a table for said vessel, a bent shaft on which the table is loosely mounted, means for rotating said shaft, means for preventing rotation of said table and a spring clamp for holding said vessel in position on said table; substantially as described.

7. A shaking machine comprising a liquid holding vessel, a table for said vessel, a bent shaft on which the table is loosely mounted, means for rotating said shaft, means for preventing rotation of said table and a vertically adjustable spring clamp for holding the vessel in position on said table; substantially as described.

8. A shaking machine comprising a liquid holding vessel, a table for said vessel, a bent shaft on which the table is mounted, means for rotating said shaft, means for preventing rotation of said table and a spring controlled clamping device for holding the vessel in position on said table; substantially as described.

9. A shaking machine comprising a liquid holding vessel, a table for said vessel, a table bearing, a bent shaft on which the table bearing is mounted, a bearing for the shaft, means for rotating the shaft and gear-teeth on said bearings for preventing rotation of said table; substantially as described.

In testimony whereof, we have hereunto set our hands.

JAMES M. CAMP.
WILLIAM AHLEN.

Witnesses:

GEORGE L. NEFF,
T. E. McDOWELL.