(No Model.)

R. SMITH.

MIXING APPARATUS.

No. 495,603. Patented Apr. 18, 1893.

Fig. 1.

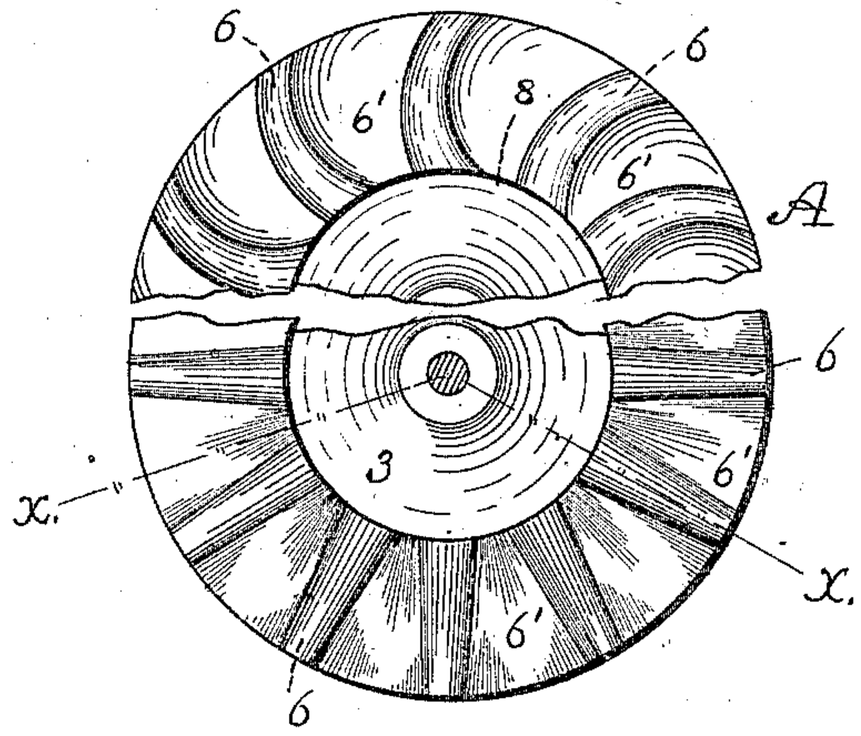
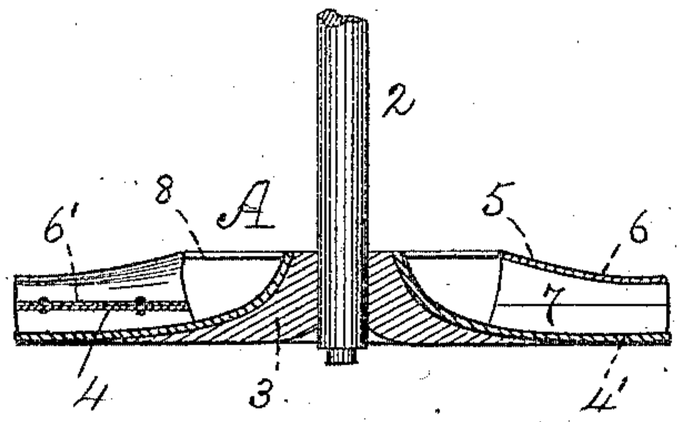
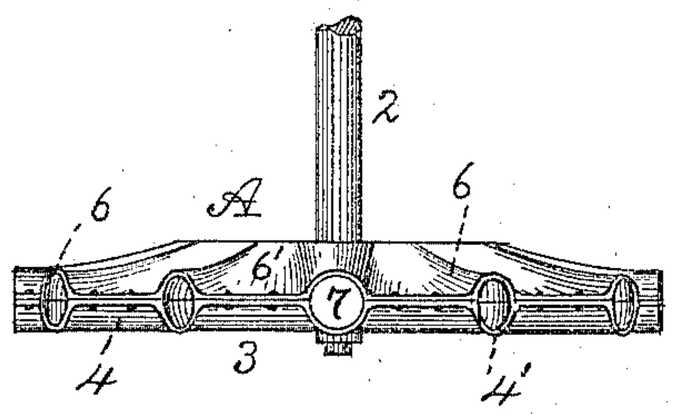


Fig. 2.



on line x.x.

Fig. 3.



Witnesses.
Francis E. Stanwood
John A. Dougherty

Inventor.
Richard Smith.
by H. E. Lodge Atty.

UNITED STATES PATENT OFFICE.

RICHARD SMITH, OF SHERBROOKE, CANADA.

MIXING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 495,603, dated April 18, 1893.

Application filed September 12, 1891. Renewed February 14, 1893. Serial No. 462,331. (No model.)

To all whom it may concern:

Be it known that I, RICHARD SMITH, a citizen of the Dominion of Canada, residing at Sherbrooke, in the county of Sherbrooke and Province of Quebec, Canada, have invented certain new and useful Improvements in Mixing Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, 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, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to that class of apparatus employed in mixing liquids or semi-liquids, as paints and like substances to render them homogeneous in character.

The object of my present improvements is to enforce the circulation, and render it thorough even when the rotary head is moving slowly. In some instances this peculiar action,—a slow motion of the agitator accompanied by active circulation, is very necessary.

The drawings herewith presented represent in Figure 1. a plan, and Fig. 2. a vertical section of an agitator embodying my invention, on line *x*, *x*, in Fig. 1. Fig. 3 is a side view in elevation.

This invention relates to that class of stirring apparatus in which the rotary head is composed of an upper annular plate and a lower disk moving in unison; further in such construction that the liquid in motion has a central downward inflow or feed, and a circumferential outflow or discharge, combined with an upward movement.

In the drawings A represents the revoluble head or agitator which is mounted on a vertical shaft 2 suitably stepped in some receptacle (not shown) but adapted to contain liquids. Said agitator is composed of a lower imperforate circular disk 3 having an upraised center preferably cone-shaped to impart a downward flow outwardly to the liquid in process of stirring. The outer portion of said disk is fluted or formed with a series of alternate elevations or ribs 4 and of grooves or depressions 4′, semi-circular or oval in cross-section, and preferably tapering toward the outer edge or circumference of the disk. Above said disk is secured an annular ring or plate 5, of similar construction to the disk, that is corrugated or formed with alternating ribs and depressions, respectively 6, 6′, the ribs 6 co-operating with the depressions 4′ in the annular plate to create passages or channels 7. By the contact of the ribs on the bottom disk with the depressions on the annular plate proper support is afforded said plate and divisional partitions are created to compel the liquid to pass outwardly to the circumference. Since the passages 7 taper outwardly to the circumference or are of the least diameter at their discharge ends, the liquid passing through is expedited, and the circulation increased.

In the drawings the disk and plate are shown as circular, the disk being slightly dished, while the annular plate is formed from a curved strip. It will be seen that the ribs formed by the corrugations on the upper surface of the annular plate serve to impel the liquid in contact therewith outwardly, and thus they perform the same duty as would a curved or radial rib upon a flat plate. The plate 5 is annular and does not extend inwardly to the shaft hence an opening 8 is created by which liquid is permitted to pass down and escapes outwardly through the passages 7.

The operation is as follows, assuming that rotation has been given to the shaft and agitator, and that the latter is immersed in the liquid to be stirred: The particles composing such liquid, and in contact with the agitator at once have centrifugal action imparted to them, those at the center advancing downwardly and outwardly through the opening 8 about the conical center, whence they pass through the tapered channels 7 to the circumference. Simultaneously therewith, such particles as are in contact with the upper surface of the annular plate 5 are advanced outwardly assisted by the action of the ribs 6. In this manner an active stirring or ebullition takes place occasioned by the natural inflow at the center created by the enforced outflow due to the centrifugal action of the revolving head.

What I claim is—

1. In apparatus for stirring the combination with a revoluble shaft, of an agitator or head affixed thereupon, composed of a lower disk having an upraised conical center, and an annular plate each above the disk, said

disk and plate being corrugated and the corrugations forming radial passages, when the disk and plate are put together substantially as specified.

2. In combination with a rotary shaft, and a lower disk affixed to said shaft and having an upraised center with converging ribs and depressions created alternately therein, of an annular plate above said disk provided with similar ribs and depressions forming conjointly with those of the disk tapered passages or channels when the disk and plate are put together substantially as explained and described.

3. In combination with a lower disk and the alternate elevations and depressions radially thereof, an annular plate similarly constructed and affixed above said disk, the depressions in the disk coinciding with the elevations in the plate and creating passages, substantially as stated.

In testimony whereof I affix my signature in presence of two witnesses.

RICHARD SMITH.

Witnesses:
H. E. LODGE,
FRANCIS C. STANWOOD.