

No. 753,621.

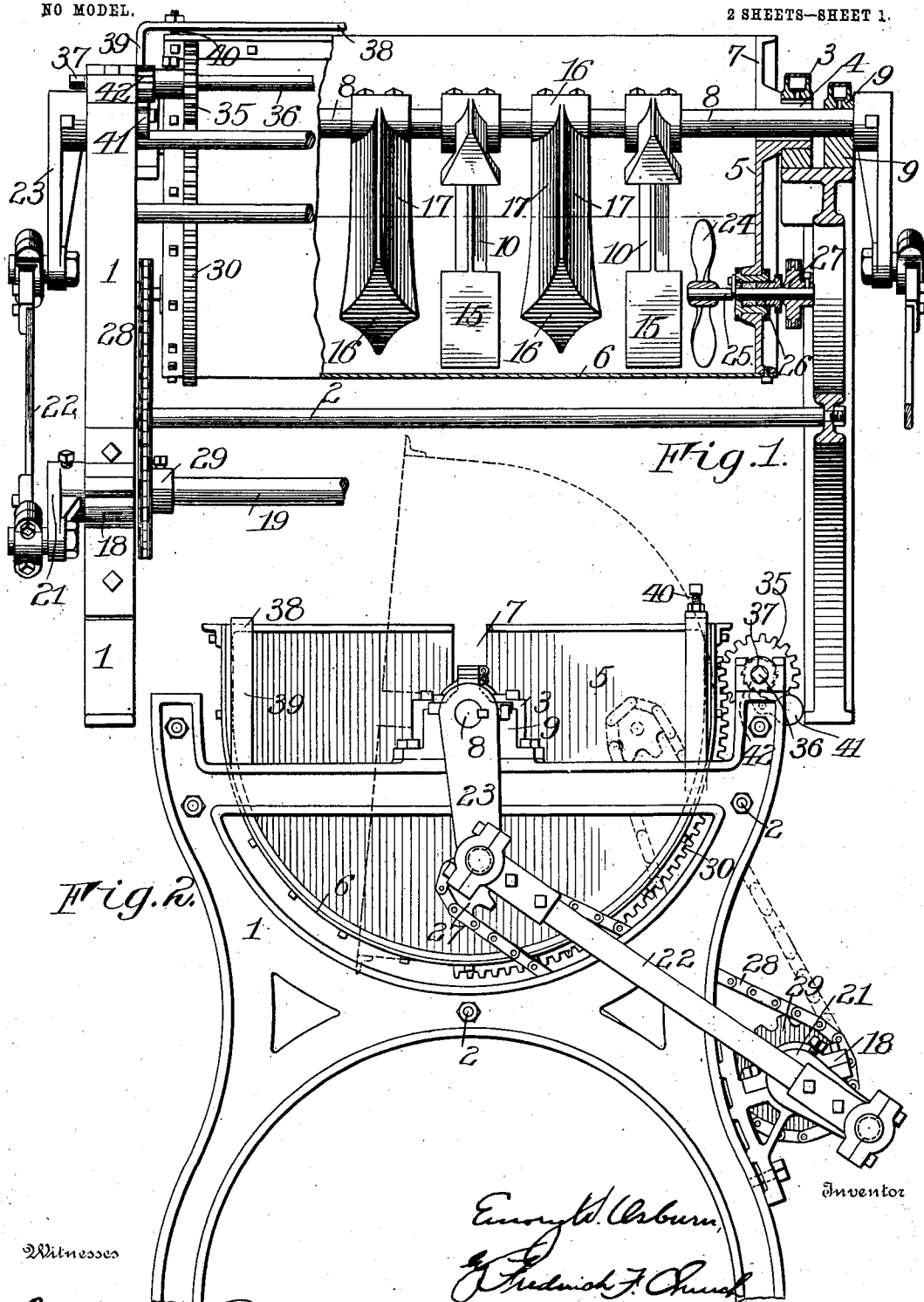
PATENTED MAR. 1, 1904.

E. W. OSBURN.
MIXING AND KNEADING MACHINE.

APPLICATION FILED FEB. 11, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses

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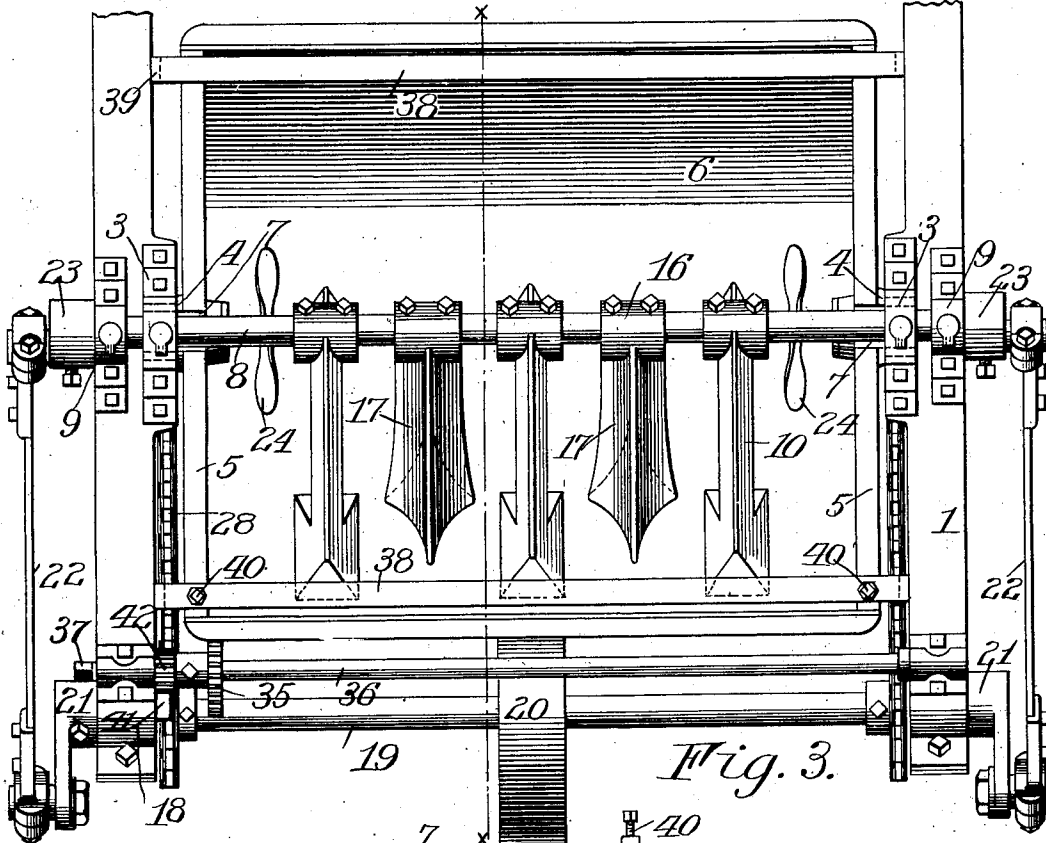


Fig. 3.

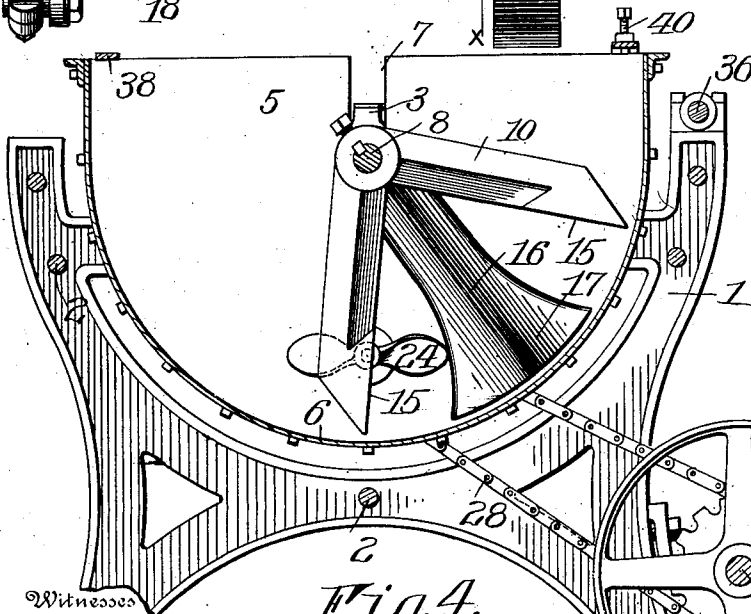


Fig. 4.

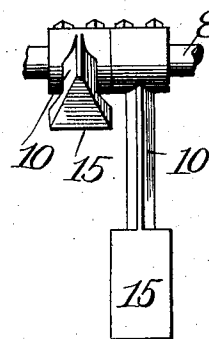


Fig. 5.

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UNITED STATES PATENT OFFICE.

EMORY W. OSBURN, OF ROCHESTER, NEW YORK.

MIXING AND KNEADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 753,621, dated March 1, 1904.

Application filed February 11, 1903. Serial No. 142,882. (No model.)

To all whom it may concern:

Be it known that I, EMORY W. OSBURN, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Mixing and Kneading Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

My present invention has for its object to provide an improved form of apparatus for mixing substances and liquids into a more or less plastic state; and it consists generally in providing a trough or receptacle in which operate beaters and stirring-arms by means of which the material, such as bread-dough, is thoroughly kneaded and mixed.

My invention further consists in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings, Figure 1 is a side elevation with parts broken away to better illustrate the construction and arrangement of the parts. Fig. 2 is an end view thereof. Fig. 3 is a top plan view. Fig. 4 is a cross-sectional view on the line *x x* of Fig. 3. Fig. 5 is view illustrating a modified form of construction of the beater-arms.

Similar reference-numerals in the several figures indicate similar parts.

A machine constructed in accordance with my invention embodies a frame consisting of the end portions 1, connected together by tie-rods 2 and provided with bearings 3, in which are supported trunnions 4, extending outwardly from the ends 5 of a trough or receptacle provided with the curved or semicircular bottom 6. The upper sides of the trunnions and the end portions of the receptacle above the latter are slotted, as shown at 7, and extending therethrough is a shaft 8, which is supported at its ends in separate bearings 9. Secured to the shaft are a series of beaters consisting of radially-extending arms 10, arranged at an angle to each other and provided at their ends and on their proximate edges with

broadened or flattened faces 15, which are adapted as the shaft is oscillated to engage the material in the trough or receptacle with percussive effect. In order that these faces may be more effective and the body of the material unaffected by the movement of the arms 10 therethrough, I form the latter angular in cross-section, making their opposite edges V-shaped, so that they will easily cut or pass through the material. Between these beaters are arranged mixing-arms 16, which are mounted upon the shaft centrally of the radially-extending beaters, having their outer ends curved and extending into proximity with the bottom 6 of the trough or receptacle. At the lower ends the arms are broadened in the direction of their movement, and they are also broadened laterally slightly, and their opposite edges are sharpened and the sides are curved, as indicated at 17, to form moldboards, which operate to force the material laterally thereof between the faces 15 on the beater-arms.

Arranged upon the frame-pieces 1 are journal-boxes 18, in which is mounted a revoluble driving-shaft 19, provided with a driving-pulley 20, preferably located between the bearings. At the ends of the shafts are provided crank-arms 21, which are attached by means of connecting-rods 22 with similar cranks 23 on the shaft 8, whereby the latter is given an oscillatory movement. These cranks being arranged at the ends of the shafts prevent the latter from being strained or twisted when the beaters are operating upon semiplastic material.

Arranged at the ends of the trough or receptacle are members adapted to engage the material therein and move it longitudinally thereof. In the present instance these members are in the form of blades 24, which are arranged at an angle to the axis of the receptacle and which, in effect, operate as screw-propellers, which are mounted on rotary shafts 25, journaled in boxes or bearings 26, in the end portions 5. At their outer ends the shafts are provided with sprocket-wheels 27, connected by chains 28 with similar sprocket-wheels 29 on the driving-shaft 19. The members 24, being arranged below the oscillatory

shaft 8, serve to force the material in the trough between the beater-arms and to keep it constantly moving away from the ends of the receptacle.

5 One end of the receptacle is provided with gear-teeth 30, and cooperating therewith is a pinion 35, mounted upon a shaft 36, journaled in the frame-pieces 1. The end of the shaft 36 is made angular, as indicated at 37, and
10 adapted to receive a suitable handle or crank-arm whereby the shaft may be revolved to tilt the receptacle, as indicated in dotted lines in Fig. 2, to permit its contents to be easily removed when desired.

15 41 indicates a pawl which engages a suitable ratchet-wheel 42 on the shaft 36 to hold the parts in adjusted position. In performing this operation the tank is revolved and the sprocket-wheels 27 are moved toward the driving-shaft 19, so that it is unnecessary to move
20 the chains 28. This movement will, however, slacken them, and they may easily be disconnected by the operator if he desires to remove them for any purpose. In order to hold
25 the trough or receptacle rigid during the kneading operation, I provide straps 38, which have downwardly-extending ends 39, pivoted to the end frames 1, and when in the operative position they extend over the top of the receptacle, at the edges thereof, as shown in Figs. 2
30 and 3. To prevent vibration of the receptacle, I provide one of the straps with clamping-bolts 40, adapted to be screwed into engagement with the receptacle when the straps
35 are positioned.

In Fig. 5 I have shown a modified form of construction of the beater-arms, in which each are arranged upon a separate hub, whereby they may be adjusted relatively longitudinally
40 on the shaft to arrange their faces 15 out of alinement and cause them to oscillate in different planes.

The operation of the device will now be readily understood. The material to be mixed
45 and kneaded is placed in the receptacle, and by revolving the shaft 19 the shaft 8 is oscillated to rock the beater-arms and mixers. The former engage the material alternately at opposite sides of the center of the receptacle and the latter cut and plow through the
50 material, forcing it laterally between the beater-arms located on either side. The revolving members or blades 24 at the ends of the receptacle engage the material and keep
55 it constantly moving away from the ends toward the center, where it is subjected to the action of the mixers and beaters.

A kneading and mixing machine constructed in accordance with my invention consists
60 of few parts, which are easily constructed, and their arrangement being simple they may be formed of sufficient strength to withstand extraordinarily hard usage without the liability of becoming worn or broken. The mixers
65 being arranged between the beater-arms and

provided with the angular faces cause the material with which they engage to be thrown to each side, and as they are also located centrally of the pairs of beater-arms the material is moved before one of the advancing
70 faces on said arms in whichever direction they may happen to be moving.

I claim as my invention—

1. In a mixing-machine, the combination with a trough and beater-arms operating
75 therein, of a separate shaft arranged in each end of the trough and rotary blades on said shafts extending at an angle to the trough, and means for revolving each blade to force the material in the trough relatively to the
80 other blade.

2. In a mixing-machine, the combination with a trough or receptacle, an oscillatory shaft therein having beater-arms operating
85 through the receptacle in proximity to the bottom thereof, of propeller-blades located at the ends of the receptacle and arranged above the path described by the lower ends of the arms.

3. In a mixing-machine, the combination
90 with a trough or receptacle, beater-arms therein and mixing-arms operating to move the material toward opposite ends of the receptacle, of blades arranged in the latter and
95 extending at an angle thereto and means for operating them independently of the mixing and beating arms to move the material toward the center of the receptacle.

4. In a mixing-machine, the combination with a trough or receptacle and mixers oper-
100 ating to move material therein outwardly in opposite directions toward the ends of the receptacle, of members at the ends of the latter operating to move said material toward the
105 center of the receptacle and means for operating the members and mixers independently of each other.

5. In a mixing-machine, the combination with a trough or receptacle, a shaft therein
110 and sets of beaters composed of arms arranged on the shaft and extending at an angle to each other, of mixers attached to the shaft and arranged intermediate said arms and between
115 adjacent sets of beaters and provided at opposite sides with diverging faces extending at an angle to their plane of movement whereby material operated upon by the mixers will be
moved laterally into the paths of the beater-arms and means for oscillating the shaft.

6. In a mixing-machine, the combination
120 with a frame, a receptacle and a rotary shaft on the frame having cranks, of an oscillatory shaft extending over the receptacle having mixing and kneading devices thereon and provided with cranks, connecting-rods extending
125 between the cranks on the two shafts and shafts journaled in the ends of the receptacle, screw-propellers on the shafts and driving connections between the latter and the rotary
130 shaft.

7. In a mixing-machine, the combination with a frame, a receptacle provided with trunnions journaled on the frame and a rack on the receptacle, of a pinion meshing there-
5 with and means for revolving it to operate the receptacle on its trunnions, a shaft extending through the latter having mixing and kneading devices thereon and a driving-shaft, connections between the two shafts, members at
opposite sides of the receptacle adapted to en- 10
gage the material therein and move it toward the center of the receptacle and driving connections between said members and the operating-shaft.

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