

L. S. PFOUTS.
 BATCH MIXER FOR ICE CREAM FREEZERS.
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Patented Apr. 25, 1911.

Fig. 1.

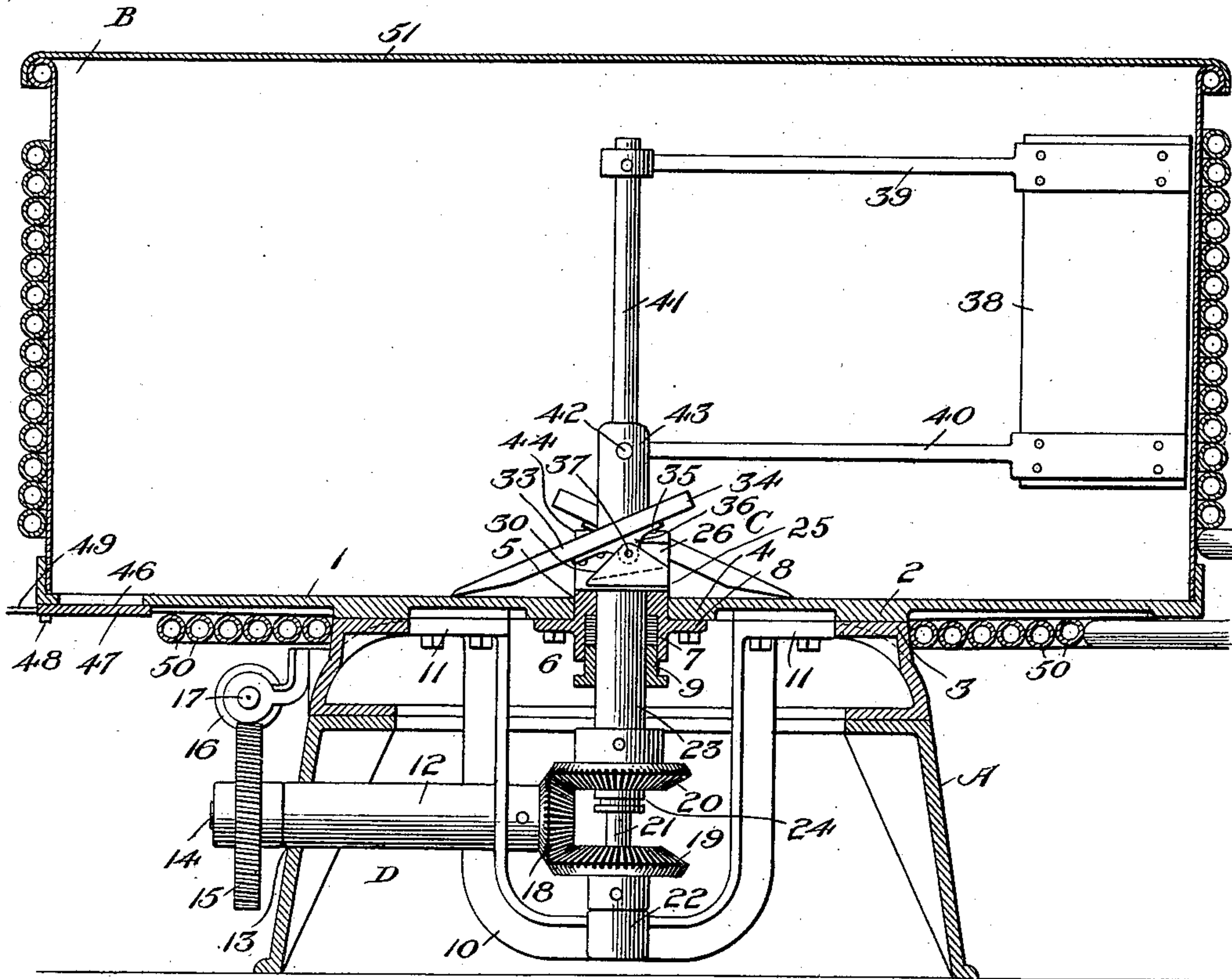


Fig. 2.

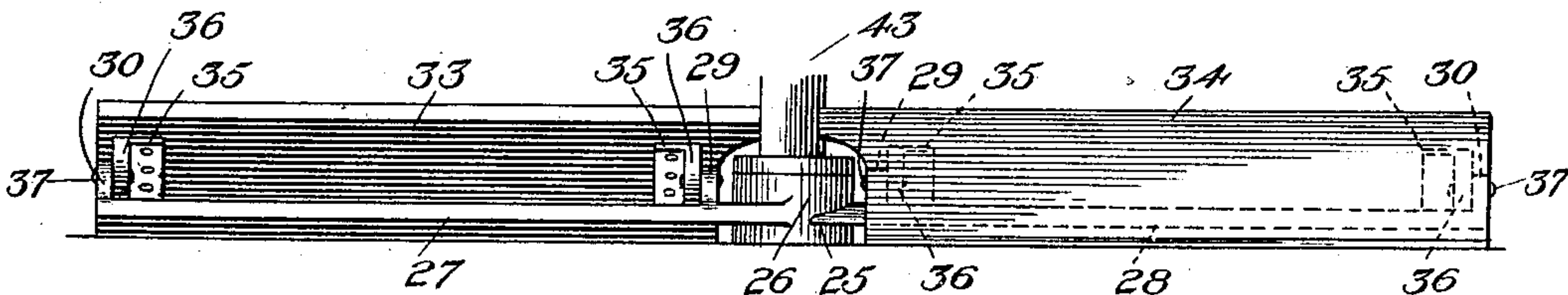
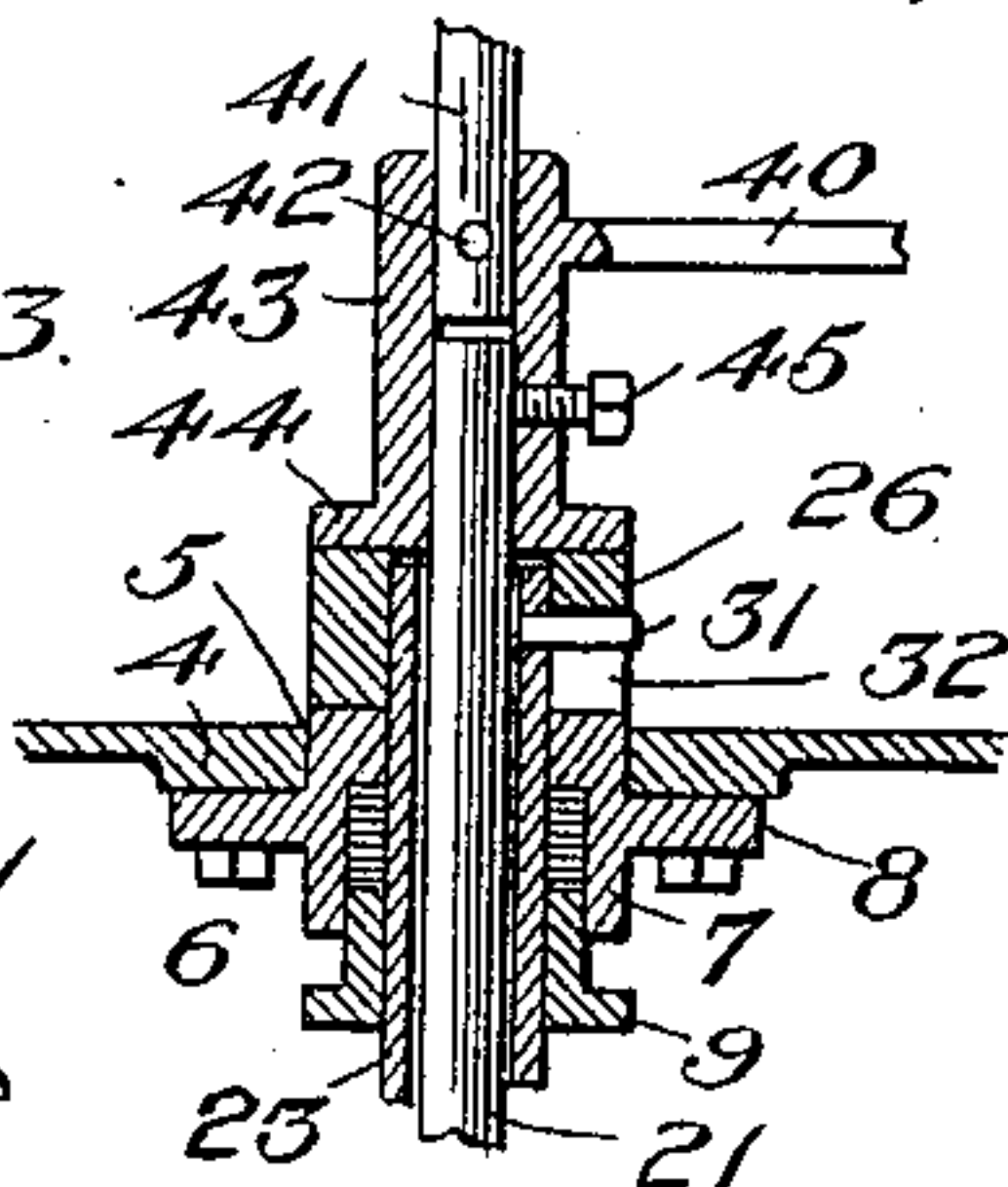


Fig. 3.



Witnesses

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BATCH-MIXER FOR ICE-CREAM FREEZERS.

990,498.

Specification of Letters Patent.

Patented Apr. 25, 1911.

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To all whom it may concern:

Be it known that I, LEROY S. PFOUTS, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Batch-Mixers for Ice-Cream Freezers, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to improvements in apparatus for mixing materials which are to be frozen.

More particularly it relates to a batch mixer for ice cream freezers.

15 Figure 1 is a central vertical section of an apparatus embodying my improvements. Fig. 2 is a view partly in side elevation and partly in section of the scraping and elevating blades at the bottom of the batch tank, part of the operating mechanism for these blades being shown. Fig. 3 is an enlarged detail view showing, partly in section, the driving connections for the agitating mechanism in the batch tank.

25 In the drawings, A indicates a suitable base or frame upon which is mounted a batch tank B, preferably cylindrical in shape.

C represents as an entirety a two part agitating and mixing device arranged within the batch tank, and D power transmitting mechanism for rotating the parts of said agitating and mixing device in opposite directions.

35 The bottom 1 of the batch tank has an annular boss 2 which rests upon annular ring 3 at the top of the frame A. At its center the bottom of the tank B has a downwardly extending boss 4 having an axial opening 5 therethrough. In this opening 5 is fitted a stuffing box 6 of suitable construction. I have shown it consisting of a hollow part 7 having a flange 8 suitably bolted to the boss 4 and an adjustable head 9 fitted within the part 7.

45 10 is a bearing bracket depending from the center of the frame A. At its upper end it has lateral extensions 11 which may be suitably bolted to the top wall of the said frame. This bracket carries or has formed integrally with it a laterally projecting bearing 12, which at its outer end extends through an opening 13 in the frame A and is supported by the walls thereof.

14 is a shaft mounted in the bearing 12 and having secured to its outer end a worm wheel 15.

16 is a worm in mesh with the worm wheel 15 and rigidly secured to a power shaft 17 suitably mounted, preferably in bearings carried by the frame A. Any well known means may be employed for rotating the power shaft 17, and as such means in themselves form no part of my invention, they are not shown in the drawings.

18 is a bevel gear rigidly secured to the inner end of the shaft 14 and in mesh below with a bevel gear 19 and above with a bevel gear 20. The bevel gear 19 is rigidly secured to a vertically disposed shaft 21 which is suitably mounted at its lower end in a bearing 22 in the bracket 10. The upper end of the shaft 21 extends through the stuffing box 6 and into the interior of the tank B. The bevel gear 20 is rigidly secured to a hollow shaft 23 which surrounds the shaft 21 and also extends through the stuffing box 6 into the interior of the tank B. Preferably the lower end of the shaft 23 or the bevel gear 20, as desired, bears against a thrust collar 24 carried by the shaft 21.

25 is a carrying frame for the scraping and agitating paddles or blades constituting one part of the agitating and mixing mechanism. This frame comprises a hub portion 26 from which extends laterally at either side arms 27, 28, each carrying a pair of ears 29, 30, the ears 29 being near the hub 26, and the ears 30 being at the free ends of their respective carrying arms. The frame 25 may be detachably connected to the hollow shaft 23 in any suitable manner. For this purpose I have shown the said shaft carrying near its upper end a laterally projecting lug or pin 31 which is adapted to enter a vertically disposed slot or recess 32 extending from the bottom of the hub 26, upwardly at one side thereof, so that the frame 25 may be readily detached upwardly from the shaft 23 for the purpose of removing the scraping and elevating blades from the batch tank.

33, 34, represent the scraping and elevating blades which are carried by the frame 25. They are preferably pivotally mounted to swing about a horizontal axis and in such manner that their scraping edges will tend to press or bear at all times against the bot-

tom wall of the batch tank. This pivotal mounting may be accomplished in any desired manner. For illustration, I have shown the said scraping and elevating blades provided on their under surfaces and adjacent to their respective supporting ears 29, 30, with cleats or plates 35 carrying downwardly extending lugs or ears 36, each pivotally connected at 37 to the adjacent bearing ear on the frame 25. This pivotal connection 37 is nearer the rear than the front edge of the scraping and elevating blade in order that the front edge of the blade will, under the action of gravity, always tend to bear against the bottom 1 in the mixing tank.

The second part of the agitating and mixing mechanism comprises a vertically disposed preferably flat paddle 38 supported by laterally projecting arms 39, 40, so as to have its lower edge travel in a horizontal plane closely adjacent to the horizontal plane of the top edges of the blades 33, 34, the arms 39, 40 being rigidly secured to an axially disposed shaft 41, which at its lower end is rigidly secured, as by means of a pin 42, to a clutch collar 43. This collar 43 has a flange 44 which bears against the hub 26 of the frame 25. The shaft 21 extends up into the collar 43 and may be detachably secured thereto, as by means of a set screw 45. The paddle mechanism just described is constructed relatively light so that the friction between the flange 44 and the hub 26 may be disregarded, although an antifriction thrust bearing may be interposed at this point if desired.

In operation power is applied to the shaft 17, and is transmitted to the bevel gear 18 which rotates the bevel gears 19 and 20 in opposite directions, so that the paddle 38 and the scraping and mixing blades 36 are rotated in opposite directions. The substances to be treated in a mixer of this type generally consist of liquids and solids, some of the latter, such as sugar and coloring matter being dissolved by the liquids, the other solids, such as fresh and preserved fruits remaining undissolved. It is desirable that the batch be thoroughly mixed and all of the material which should be dissolved by the liquid be taken up thereby. The scraping and elevating blades 33, 34, move with their lower front edges in engagement with the bottom wall of the batch tank. They tend to scrape any substances which have settled to the bottom of the tank up therefrom and these substances move rearwardly and upwardly along the inclined front surface of the said blades, and the whirling action of the blades combined with their inclination tends to whirl or move said substances upwardly within the liquid in the tank. The agitating paddle 38 rotating in the opposite direction from the scraping

and elevating blades 33, 34, sets up a severe agitation of the batch above the said blades and the combined action of these agitating and mixing parts tends to effect a thorough stirring and mixing of the substances in the batch tank.

Any suitable means may be used for removing or withdrawing the batch from the tank B after it has been treated therein. For the purpose of illustration I have shown a discharge opening 46 extending through the bottom wall 1, and controlled on its under side by a flat gate or valve 47 pivoted at 48 to the bottom wall, and having an operating handle 49.

In some instances it is desirable to reduce the temperature of the mixture within the batch tank for the purpose of keeping the mixture from spoiling, or facilitating its rapid freezing when transferred to the freezer, or for both these purposes. To accomplish this, a circulating coil 50 for a refrigerant medium may be placed about the batch tank. The circulation of the refrigerant medium through this coil 50 may be effected in any well known manner. A suitable top or cover 51 may be fitted to the tank B if desired.

What I claim is:

1. In a mixing apparatus, the combination of a tank having bottom and side walls, a shaft axially arranged within the tank, a sleeve surrounding said shaft, a material-scraping and elevating mechanism comprising a carrying frame connected with the said sleeve, and an inclined blade pivotally mounted upon the said carrying frame having its front longitudinal edge in engagement with the bottom wall of the tank, and its opposite longitudinal edge arranged rearward of the said carrying frame, a vertically disposed material agitating and mixing paddle extending in a radial direction, and having its free longitudinal edge closely adjacent to and parallel with the side walls of the tank, means for connecting the opposite ends of the paddle to said shaft, and means for rotating the shaft and sleeve in opposite directions.

2. In a batch mixing machine, the combination of a tank having bottom and side walls, a rotatable member carrying a radially extending, revoluble arm, an inclined plate connected to rotate with and overlying the arm for scraping and elevating the material from the bottom wall of the tank, the front edge of the plate being disposed to move adjacent to or in engagement with the bottom wall of the tank and its opposite edge extending rearwardly of the said arm, a vertically disposed, revoluble material agitating and mixing paddle, having its free longitudinal edge closely adjacent to and parallel with the adjacent side wall of the tank and being of less length than the ra-

dius of the circle defined by its free edge, arranged above the said inclined plate, and means for moving the paddle and rotatable member about a common axis in opposite
5 directions.

3. A batch mixer comprising a tank having a discharge opening through the bottom horizontal wall thereof, a valve for said discharge opening, a two-part agitating and
10 mixing mechanism arranged within the tank, one of said parts having a scraping and material elevating plate with one edge arranged to scrape material from the bottom of the tank, and the other of said parts
15 having a paddle arranged to operate above

said scraping plate, said plate periodically 20 sweeping over said discharge opening, and driving means for rotating the parts of said agitating and mixing mechanism in opposite directions arranged beneath the bottom of said tank and connected with said parts 25 by rotatable elements extending through the bottom of the tank.

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

LEROY S. PFOUTS.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
