

Dec. 6, 1938.

C. R. STOELTING

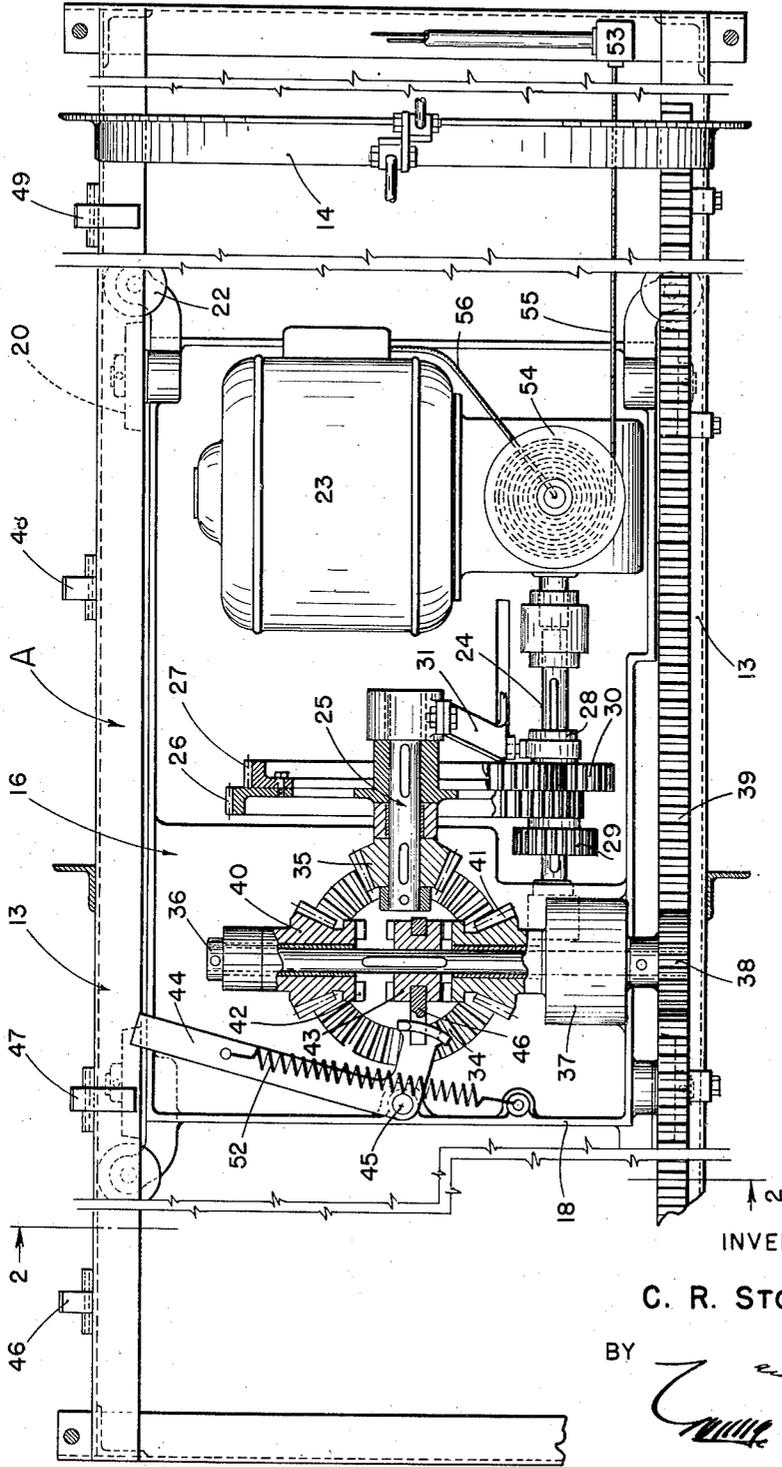
2,139,338

CURD AGITATOR

Filed April 30, 1936

3 Sheets-Sheet 1

FIG. 1.



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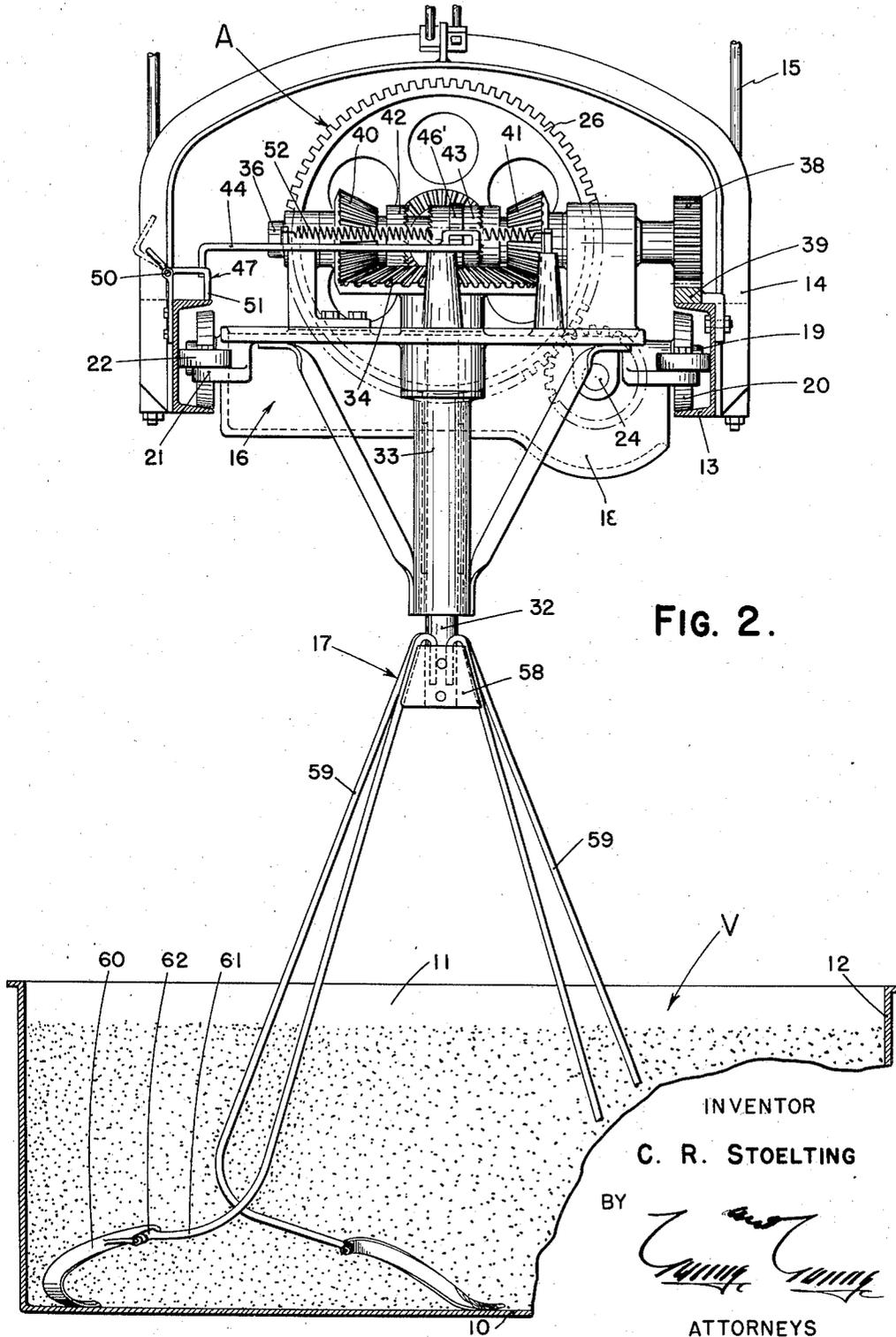


FIG. 2.

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FIG. 3.

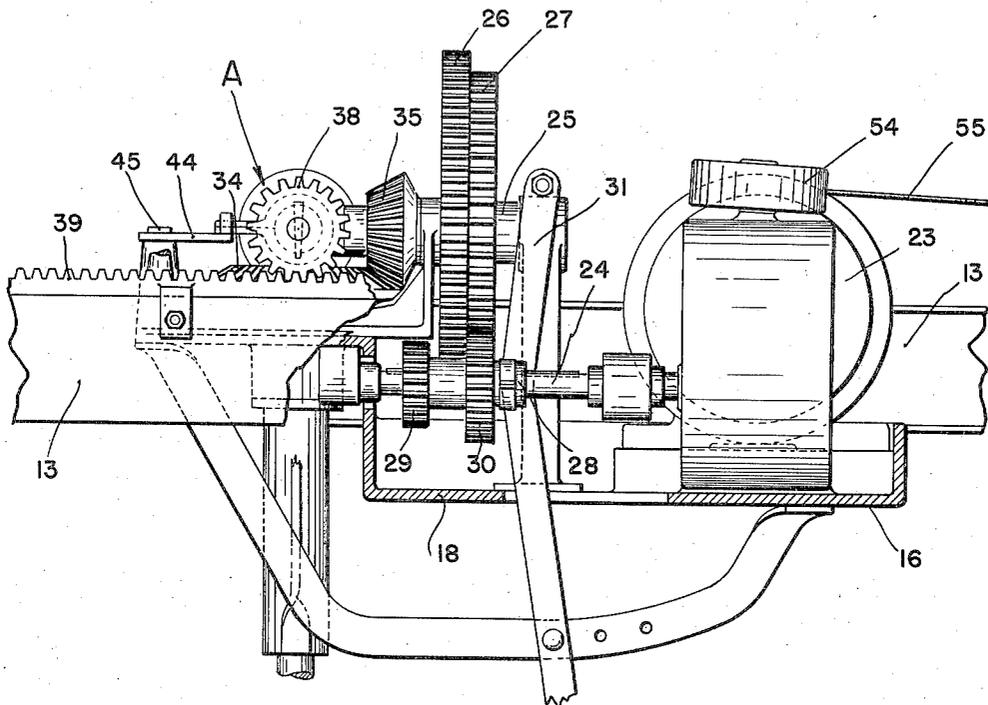


FIG. 4.

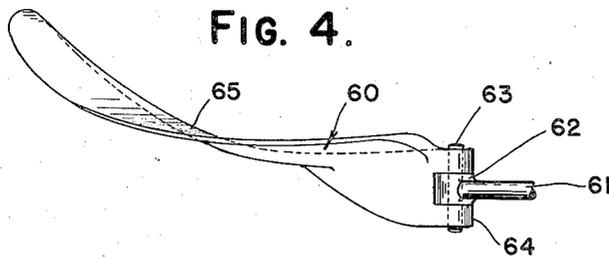
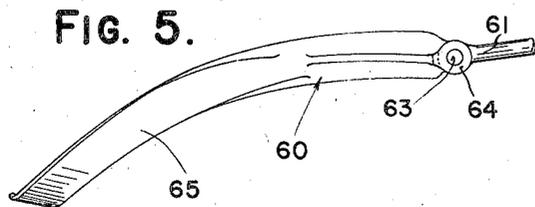


FIG. 5.



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# UNITED STATES PATENT OFFICE

2,139,338

## CURD AGITATOR

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Application April 30, 1936, Serial No. 77,219

2 Claims. (Cl. 74—37)

This invention appertains to the manufacture of cheese, and more particularly to a novel device for agitating the curds incident to steps in the art of cheese-making.

One of the primary objects of my invention is to provide a curd agitator or forker embodying a carriage mounted above the curd vat, carrying the rotatable forker or agitator element, with novel means for automatically reciprocating the carriage back and forth along the vat without the necessity of employing endless operating chains and the like.

Another salient object of my invention is to provide novel means for rotating the forker or agitator element continuously in one direction, irrespective of the direction of the travel of the carriage.

A further object of my invention is the provision of means for controlling the distance of travel of the carriage, whereby the same can be made to travel the full length of a vat or only a portion of the length of the vat, the construction being particularly useful when the device is to be employed with vats of different lengths.

A further important object of my invention is the provision of a novel construction of forking blades, whereby not only will the curds be agitated and scraped from the bottom of the vat, but the curds at the bottom will be moved upwardly and turned over and thus mixed with the other curds, thereby rendering the device particularly useful during the salting of the curds.

A still further object of my invention is to provide an improved curd agitator or forker of the above character, which will be durable and efficient in use, one that will be simple and easy to manufacture, and one which can be placed upon the market at a reasonable cost.

With these and other objects in view, the invention consists in the novel construction, arrangement, and formation of parts, as will be hereinafter more specifically described, claimed, and illustrated in the accompanying drawings, in which drawings:

Figure 1 is a fragmentary top plan view of my improved curd agitator or forker, with parts thereof broken away and in section to illustrate structural details.

Figure 2 is a transverse section through the improved device, taken substantially on the line 2—2 of Figure 1, looking in the direction of the arrows, the view also showing the novel forking element in the vat.

Figure 3 is a fragmentary longitudinal section through the improved device, illustrating the

novel means for operating the forker or agitating element from the drive motor.

Figure 4 is a plan view of one of the forker blades.

Figure 5 is a side elevation of the same.

Referring to the drawings in detail, wherein similar reference characters designate corresponding parts throughout the several views, the letter A generally indicates my improved curd agitating appliance, and V a vat with which the same can be used.

The vat V can be of any preferred character or make, and is of an elongated construction. As shown, the vat includes the bottom wall 10, the end-walls 11, and the side walls 12.

Arranged above the vat V is a pair of spaced, longitudinally extending, supporting tracks 13, which can be of a channel beam construction. These tracks 13 are held in their proper spaced relation by inverted, U-shaped supporting brackets or castings 14, and the tracks and castings are rigidly secured to an overhead support, such as a ceiling of a room, by means of suspension rods 15.

Mounted for reciprocatory movement on the tracks 13 is the carriage 16, which rotatably supports the agitating or forking element 17.

The carriage 16 may include an elongated bed plate 18, having mounted at its four corners outwardly extending spindles or stub axles 19 on which are rotatably mounted the wheels 20 for engaging the tracks 13. To prevent twisting or lateral shifting of the carriage in the tracks, the bed plate 18 can also be provided at its corners with bracket arms 21, which carry vertical pivot pins for the reception of horizontally disposed rollers 22, which engage the side walls of the tracks.

Mounted upon the bed plate 18 in any preferred manner is an electric drive motor 23 of the desired rating. Arranged at right angles to the motor 23 is a main drive shaft 24 rotatably supported in suitable bearings, and this shaft 24 is properly driven through a reduction gearing from the armature shaft of the electric motor.

Disposed in spaced parallel relation to the drive shaft 24 is a counter-shaft 25 driven from the drive shaft by a suitable transmission. This transmission includes spur gears 26 and 27 of different diameters, and these gears are keyed or otherwise secured to the counter-shaft. Feathered upon the drive shaft 24 is a shift unit 28 embodying shift gears 29 and 30 of different diameters. Obviously, when the gear 30 is shifted into mesh with the gear 27, the shaft 25 will be driven at one speed and the gear 29 will be

out of mesh with its gear 26. When the shift unit is moved to the right (see Figure 1), the gear 30 will be moved out of engagement with its gear 27, and the gear 29 will be moved into mesh with its gear 26, and the shaft will be operated at a different speed. The shift unit 28 can be operated in any desired manner, such as by the use of a manually actuated operating lever 31.

The drive shaft 32 for the forker element 17 is arranged in a vertical plane and is rotatably mounted in an elongated bearing sleeve 33 secured to the carriage 16. The upper end of the shaft has keyed or otherwise rigidly secured thereto a beveled gear 34, which has constantly meshing therewith a beveled drive pinion 35 keyed or otherwise secured to the counter-shaft 25. Obviously, during the travel of the carriage, the shaft will be rotated from the motor.

The drive mechanism just described is also utilized for reciprocating the carriage 16 back and forth along the supporting track, and I lay particular stress on the means employed for actuating the carriage, in that said means is of a simplified and durable character and entirely eliminates the use of drive sprocket chains as employed in some curd agitators.

The means for reciprocating the carriage on the track includes an operating shaft 36 arranged at right angles to the counter-shaft 25 and the supporting tracks 13, and this shaft is rotatably mounted in suitable bearings 37 carried by the bed plate. One end of the shaft has formed thereon or secured thereto a drive pinion 38, which meshes with the teeth of a rack bar 39 rigidly secured to the upper face of one of the tracks 13. Upon rotation of the operating shaft 36, the pinion will be rotated and thus will move the carriage along the track. The shaft 36 is driven in a novel manner from the counter-shaft, and means is provided for reversing the direction of rotation of the shaft 36 from the counter-shaft, so that the carriage can be operated in both directions.

Rotatably mounted on the operating shaft 36 at spaced points is a pair of beveled pinions 40 and 41, which are in constant mesh with the beveled gear 34 of the forker drive shaft 32. The inner ends of the pinions 40 and 41 have formed thereon clutch faces 42, and feathered on the shaft 36 between said clutch faces is a double-faced clutch section 43.

By moving the clutch section 43 into driving engagement with either the pinion 40 or the pinion 41, the shaft 36 can be driven in either one direction or the other without change in the direction of rotation of the shaft 25, or without changing the direction of rotation of the forker or agitating element 17. This is particularly advantageous in the agitation of the curds.

The clutch section 43 is automatically shifted during the travel of the carriage, and this means includes a bell crank-shaped operating lever 44. The lever 44 is rockably mounted at its angle on a pivot pin 45 mounted upon the carriage 16, and the short arm of the lever has operative connection with a shift yoke 46 rotatably mounted upon the clutch section 43. The long arm of the lever 44 is extended laterally beyond the carriage over one of the tracks 13, and this track 13 carries a plurality of trips 46, 47, 48, and 49. The trips are pivotally mounted on the mentioned track 13, as at 50, so that the same can be swung into and out of the path of travel of the long arm of the lever 44. Each trip is provided with a depending foot 51 for resting on the

track, so that the trip will be held in proper position when the same is moved over the track and in the path of travel of said lever.

Only two of the trips are utilized at a time, and thus the lever travels between two trips, and by selecting the trips the length of the travel of the carriage can be controlled.

As shown in Figure 1, the trips 47 and 49 are in their operative position and the trips 46 and 48 are swung away from the track into their inoperative position, and the long arm of the lever moves between the trips 47 and 49.

Considering that the carriage is moving to the right in Figure 1, it can be seen that when the lever 44 reaches the trip 49, the trip will swing the long arm of the lever to the left, shifting the clutch section 43 into engagement with the clutch face of the pinion 40. This will reverse the travel of the carriage, and when the long arm of the lever strikes the trip 47, the same will be moved to the right, and thus the clutch section will again be shifted into engagement with the clutch face of the pinion 41, and the carriage will be moved in the opposite direction.

In order to hold the lever 44 in either one of its two positions against accidental movement, I provide a relatively heavy coil spring 52, which is secured to the carriage 16 and to the long arm of the lever 44. The spring is so positioned that as the lever swings off center on either side of the pivot pin 45, the same will function to hold the lever in such position.

Mounted upon the supporting frame for the tracks 13 is an outlet box 53, into which is extended the feed and return wires leading from any suitable source of electric energy.

Mounted upon the casing of the speed reduction unit is a spring take-up device 54 for the electric cable 55. This may take the form of a spring take-up reel and the cable 55 leads from the outlet box 53, and the wiring 56 for the motor leads to the contacts of the spring take-up reel. Thus, during the travel of the carriage, the cable 55 is automatically taken up or paid off the reel 54.

The agitating or forking element 14 includes a frusto-conical head 58 having grooves in its outer face for the reception of the supporting rods or shanks 59 of the forker blades 60. The upper ends of the shanks or rods 59 are bent back and are inserted in suitable openings in the head 58. Obviously, due to the connection of the head 58 with the shaft 32, the head will be rotated constantly with the shaft. The lower ends of the rods or shanks 59 are bent substantially at right angles, as at 61, and each carries hinge barrels 62 for the reception of hinge pins 63, which rockably receive the barrels 64 formed on the inner ends of the blades 60.

As brought out in the objects of the specification, the forker blades 60 form an important part of my present invention, and the same each includes an elongated arcuate body 65, which is gradually twisted throughout its length, so as to form in effect a screw action.

As the carriage is reciprocated back and forth and the forker element is rotated, the blades not only effectively agitate the curd and scrape the curd from the bottom of the vat, but the blades lift and feed the curd upwardly and turn the same, and thus the curd from the bottom is mixed with the other curd.

This is very desirable, especially in salting the curd, since otherwise the salt will not mix with the curd in the bottom of the vat.

From the foregoing description, it can be seen that I have provided an exceptionally simple and durable form of curd agitator, which will effectively accomplish the purpose intended in a facile and efficient manner.

Changes in details may be made without departing from the spirit or the scope of my invention, but what I claim as new is:

1. In a curd agitator and forker, a supporting track, a carriage slidably mounted upon the track, a drive motor on the carriage, a rack bar arranged longitudinally of the track, an operating shaft, a pinion on said shaft meshing with the teeth of the rack bar, a beveled gear rotatably mounted on the carriage, a depending work shaft carried by the gear, means for driving the gear and work shaft continuously in one direction from the motor, beveled pinions rotatably mounted on the operating shaft and meshing with the opposite sides of the gear, said pinions having adjacent clutch faces, a double-faced clutch section feathered upon the operating shaft between the pinions, an operating lever for the clutch section, and trips carried by the track and arranged in the path of the lever for shifting the lever in one direction or the other, during the travel of the carriage, for shifting the clutch section in engagement with the clutch face of one pinion or the other, said trips being hingedly

carried by the track and movable into and out of the path of the lever.

2. In a curd agitator and forker, a supporting track, a carriage slidably mounted upon the track, a drive motor on the carriage, a rack bar arranged longitudinally of the track, an operating shaft, a pinion on said shaft meshing with the teeth of the rack bar, a beveled gear rotatably mounted on the carriage, a depending work shaft carried by the gear, means for driving the gear and work shaft continuously in one direction from the motor, beveled pinions rotatably mounted on the operating shaft and meshing with the opposite sides of the gear, said pinions having adjacent clutch faces, a double-faced clutch section feathered upon the operating shaft between the pinions, an operating lever for the clutch section, and trips carried by the track and arranged in the path of the lever for shifting the lever in one direction or the other, during the travel of the carriage, for shifting the clutch section in engagement with the clutch face of one pinion or the other, said trips being hingedly carried by the track and movable into and out of the path of the lever and arranged at different points on the track, whereby different trips can be selected to control the length of travel of the carriage on the track.

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