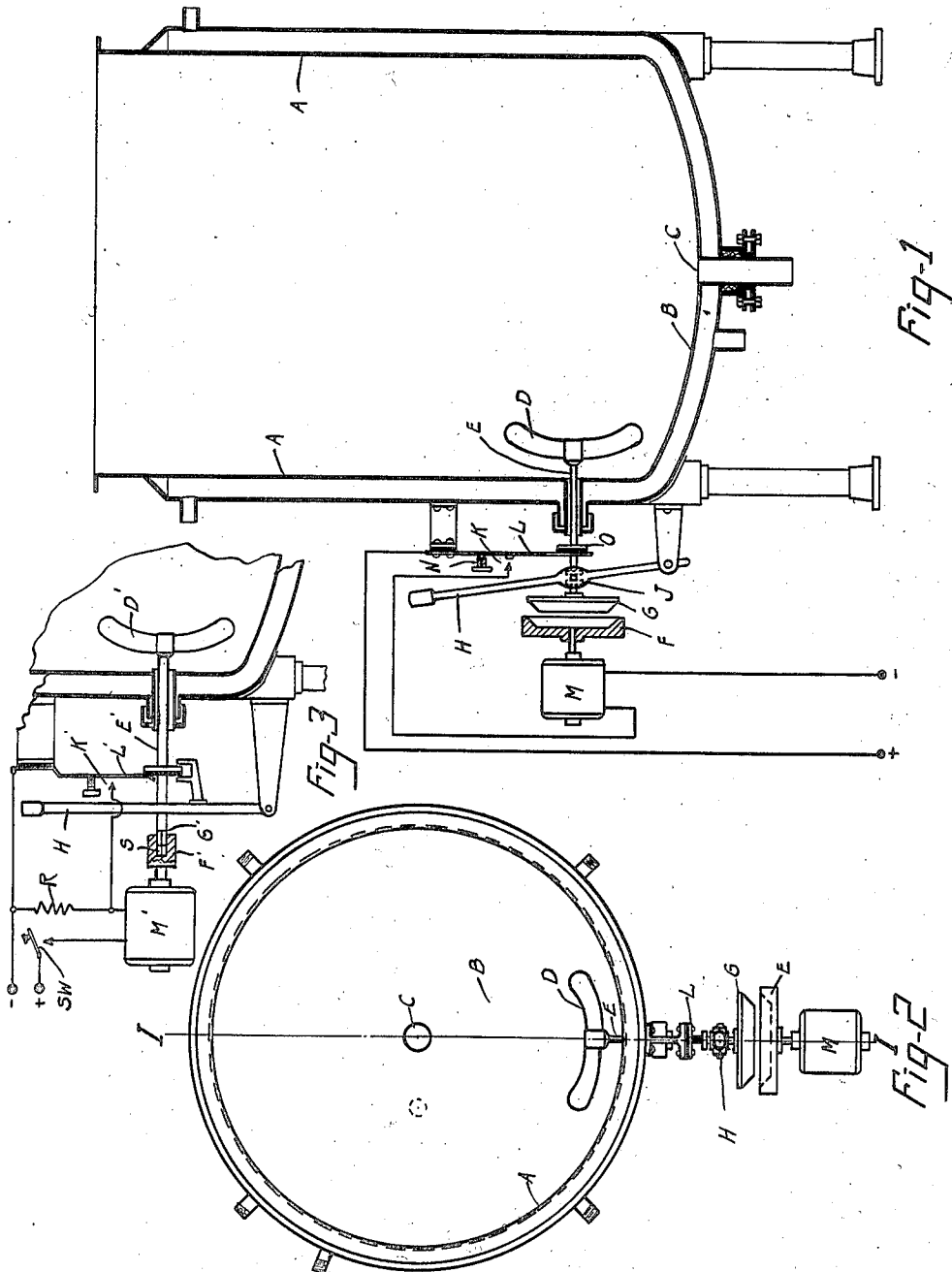


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 CONTROLLER FOR AGITATING MECHANISMS.
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To all whom it may concern:

Be it known that I, MAX DONAUER, a citizen of the United States, residing at Elyria, in the county of Lorain and State of Ohio, have invented certain new and useful Improvements in Controllers for Agitating Mechanisms; and I do hereby declare the following to be a full, clear, concise, 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.

My invention relates to controllers for agitating mechanisms, and particularly controllers for controlling the motion of agitating mechanisms, such as propellers or like devices adapted to be immersed in a liquid to be processed and by whose movement the functions, sought to be secured by the agitation of the liquid, are performed.

It is a particular object of my invention to control the speed of the moving element of the agitating mechanism, such as a propeller of the like, in such a way that when the liquid in a container is exhausted from the container to a predetermined low level, that the propeller or like device will operate at a reduced speed, or if preferred, will cease its motion entirely.

It is a further object to provide such a controller as may be simple in operation and inexpensive to manufacture and which may be added to existing installations at minimum expense, and which will furthermore operate reliably with little attention. The aforesaid and other objects of my invention will be better understood from a description of the several embodiments thereof herein described and shown in the accompanying drawings; in which—

Figure 1 illustrates an embodiment of my invention shown mostly in a vertical cross section, the embodiment illustrated comprising a cylindrical tank equipped with a propeller and motor means for operating the propeller, together with controlling means for controlling the action of the motor means.

Figure 2 illustrates a plan view of the embodiment illustrated in Figure 1.

Figure 3 illustrates a different embodiment, certain parts being shown in section, other parts which will be understood from the other figures, being omitted.

Referring first now to the embodiment illustrated in Figures 1 and 2, at A—A, I show the cylindrical side walls of an upright cylindrical tank, and at B, I show a downwardly curved bottom for the tank, an exhaust outlet therefor being shown at C, the tank also being shown with an enclosing jacket for the purpose of thermally effecting the temperature of the tank contents in the well known manner.

At D is shown a propeller mounted on a shaft E, which passes through a side wall of the tank, the shaft in the embodiment illustrated being horizontally mounted in a vertical plane co-inciding with an axis of the tank. At M is shown a motor for driving the propeller and at F and G are shown the elements of a clutch mechanism, by means of which motion may be communicated from the motor M to the propeller D.

A hand lever H is provided and adapted to engage the shaft E at a point J for the purpose of shifting the element F thereof, and also at the same time to operate the contacts K in the motor energizing circuit, for the purpose of causing the motor to rotate; one of the elements of the contact set K is mounted on a spring L which, by means of the adjustable screw N is caused to oppose the thrust action of the propeller D when the propeller is rotated and to restore the propeller to its extreme inoperative normal position when the motor is shut off. The system of my invention operates as follows:

The tank being filled with liquid substantially above the level of the propeller, the operator, by means of the hand lever H will throw the friction clutch elements F and G together, thereby moving the propeller D toward the adjacent side wall of the tank, and at the same time, the motor M is started by the closure of the contacts K, said closure caused by the motion of the propeller shaft E, being communicated to the contact spring L, by means of a collar O, mounted on the shaft E.

The motor being started, and the clutch operated, the propeller will rotate, and, assuming the direction of rotation and the pitch of the propeller to be such that a thrust tendency away from the center of the tank will be realized, the propeller will seek and maintain a position as far distant from the

tank center as possible, and will maintain the clutch in its closed position, and maintain the contacts K closed, against the resilient power of the spring L, independently of the hand lever H, which will now be released by the operator.

The propeller will operate thenceforth in the usual way to cause agitation of the tank contents; now should a portion of the tank contents be withdrawn, or the tank contents be gradually withdrawn, and the level of the liquid be lowered until the propeller is partially or entirely uncovered, the power of the spring L, will overcome the thrust tendency of the propeller on account of the fact that the power of the thrust will be considerably lessened, and the spring L will thereupon cause the clutch elements F and G to disengage, at which time the rotative motion of the shaft E will be entirely discontinued and the shaft will thereupon be moved inwardly toward the center of the tank by the spring L until it reaches normal position. The opening of the contacts K will also take place upon the longitudinal displacement of the shaft E and therefor the entire mechanism will be restored to normal inoperative position.

By virtue of this arrangement, churning of the liquid contents of the tank is prevented for conditions of low liquid which churning heretofore has produced deleterious effects upon certain liquids sought to be processed by agitating mechanisms, such as herein described; for instance, the churning of milk sought to be processed produces butter, and in most of the processes involving milk this is highly undesirable.

Some times it may be desired that the controlling apparatus be effected to again cause the propeller to rotate at normal operative speed, after more liquid has been placed in the tank to raise its level above the propeller blades, and the arrangement illustrated in Figure 3 is designed for this purpose.

In the embodiment illustrated in Figure 3, I preferably replace the clutch elements F and G by corresponding elements F' and G', by which motion may be communicated from the motor M' to the motor shaft E'; there being a sliding telescoping action at S, since the element F' has, as illustrated, a square hole into which the square MG of the shaft E' is adapted to fit and move longitudinally. Contacts K' corresponding to the contacts K of Figure 1 and adapted to be closed when the hand lever H' is moved to the left to start the motor to operate at operative speed, will short-circuit a resistance coil R.

The resistance coil R is suitably proportioned so that the motor M' can be operated when only the switch SW is closed, the

operation in such a case being at a considerably reduced speed, the speed of rotation of the motor shaft and therefore of the propeller shaft E' being accelerated when the contacts K' adapted to short-circuit the resistance R, are closed.

The operation of the embodiment illustrated in Figure 3 is as follows:

The operator, after filling the tank, throws the switch SW to close a circuit for the motor M', said circuit including a resistance R, the motor will rotate its shaft and by means of the simple connection F'—G' will cause the propeller D' to rotate at a relatively slow speed. The operator will also, although this may be unnecessary, operate the lever H.

The lever H is retained principally that the operation of the system may be manually controlled, as well as being automatically controlled, in case of failure of any part of the automatic apparatus. The propeller being operated and the thrust tendency being realized the contacts K' will be maintained closed until sufficient liquid is withdrawn from the tank to reduce the thrust effect upon the propeller D' so that the retractile spring L' will overcome the thrust effect and move the propeller shaft E' longitudinally toward the tank center and cause the rupture of the contacts K'.

The contacts K' being opened the motor M' will be thenceforth operated at a reduced speed through the resistance R, until the tank contents are again replenished when the thrust tendency will be increased to cause re-operation of the contacts K' and accelerated contacts of the propeller D'.

Having thus described my invention in several specific embodiments, I wish it to be understood that I do not wish to be limited to the aforesaid structure herein illustrated and described for the purpose of explaining my invention, but I am aware that numerous and extensive departures may be made from the embodiments of my invention herein illustrated, but without departing from the spirit of my invention.

What I claim is:

1. In a device of the class described, the combination with a vessel for containing liquids, agitating means for agitating the contents of the vessel, a source of power for operating the agitating means and means responsive to a predetermined low level of liquid contained in the vessel to control the action of the said agitating means upon the liquid.

2. In a device of the class described, the combination with a vessel for containing liquids, agitating means for agitating the contents of the vessel, a source of power for operating the agitating means, a clutch for associating the said source of power with the

said agitating means, and means responsive to the amount of liquid contained in the vessel for operating the said clutch.

3. In a device of the class described, the
5 combination with a vessel for containing liquids, agitating means for agitating the contents of the vessel, a source of power for

operating the agitating means, and means responsive to the amount of liquid contained in the vessel to control the speed at which 10 the said agitating means is operated.

In witness whereof, I have hereunto signed my name this 25 day of June, 1920.
MAX DONAUER.