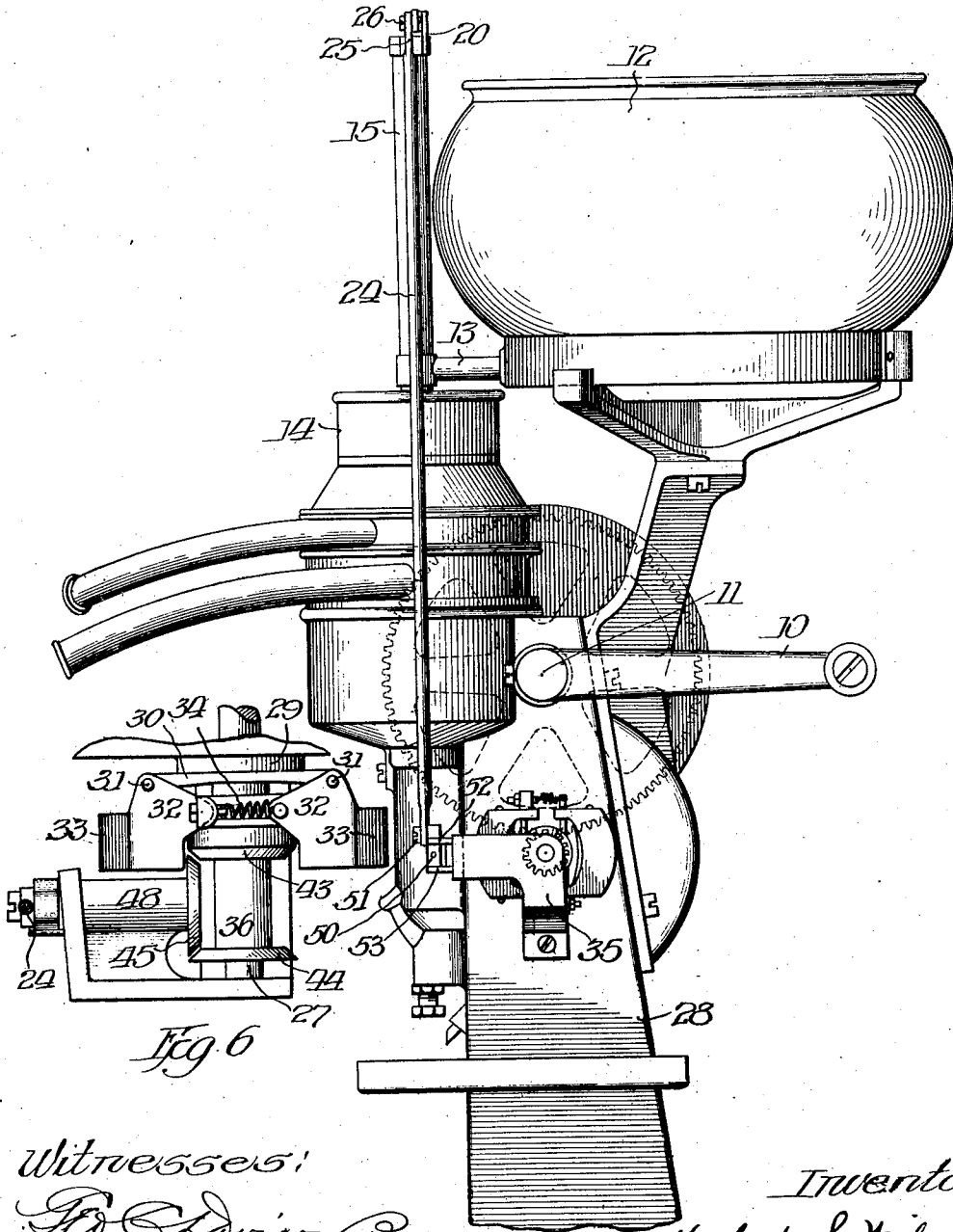


1,114,213.

Fig. 1



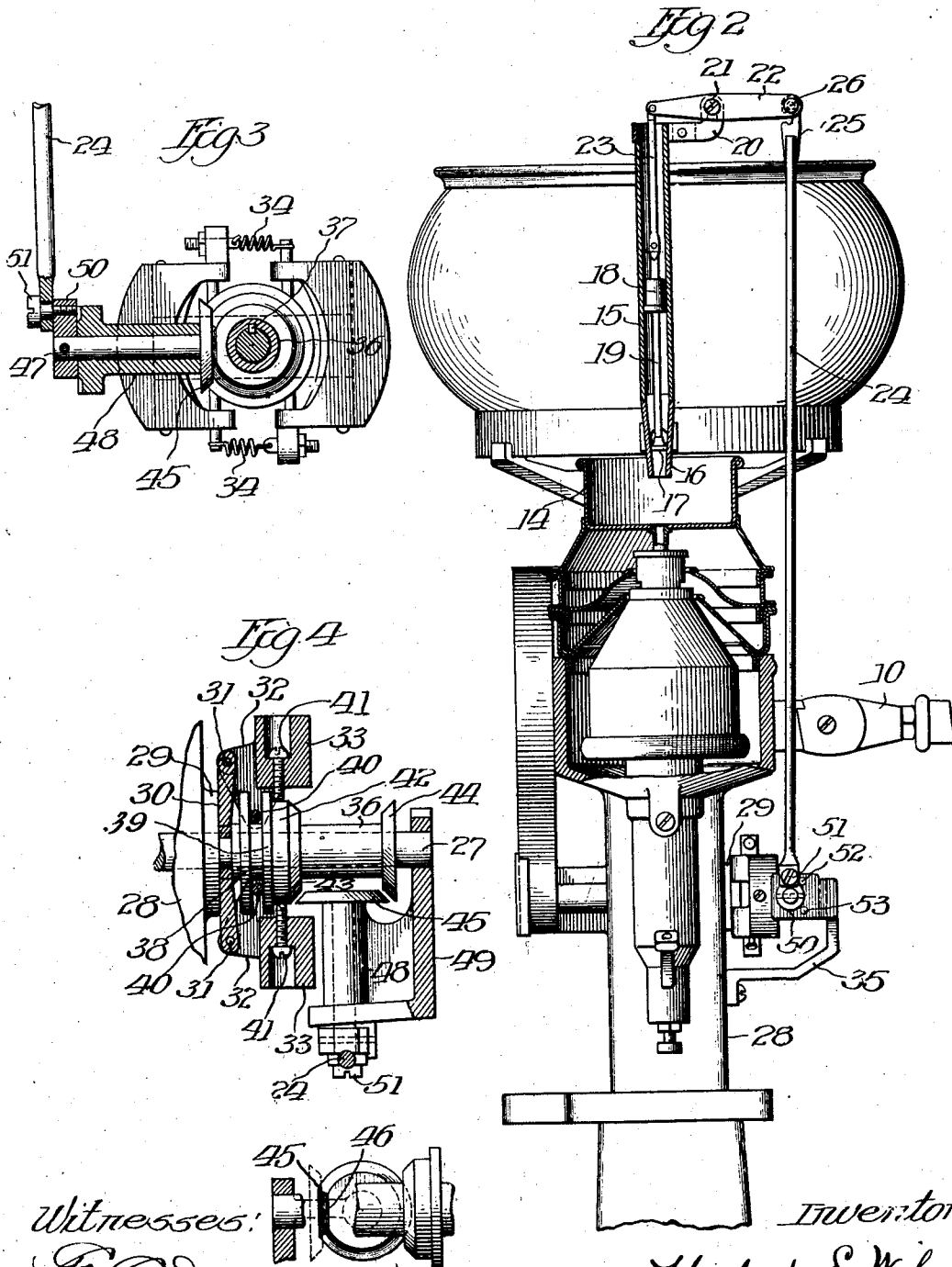
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H. S. WILSON.
LIQUID FEEDING GOVERNOR.
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Patented Oct. 20, 1914.
2 SHEETS—SHEET 2.



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LIQUID-FEEDING GOVERNOR.

1,114,213.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HERBERT S. WILSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Liquid-Feeding Governors, of which the following is a specification.

The main object of this invention is the provision of a speed-controlled governor regulating the feed of liquid to a separator, such, for example, as the supply of milk to a centrifugal cream-separator. In separators of this general character, it is important that the liquid should be permitted to flow to the separator only after the device has attained a predetermined speed; otherwise the proper separation of the liquid into its constituent parts will not be obtained.

A further object of the invention is the provision of means to regulate such flow which shall be simple in construction, economical to manufacture, composed of few parts, and unlikely to require repairs.

In the accompanying drawings, I have illustrated a preferred embodiment of this invention applied to a cream-separator, but it is to be understood that the invention is susceptible of employment in association with devices other than cream-separators.

In these drawings,—Figure 1 is a fragmentary side elevation of a cream separator supplied with my improved governor for controlling the feed of liquid to the machine; Fig. 2 is a view of the same mechanism at right angles to that of Fig. 1, and illustrates some of the parts in section; Figs. 3, 4, 5 and 6 are detail views illustrating the structural features of the speed governor.

By referring to the drawings, it will be observed that I have illustrated my improved governing device in connection with a cream-separator of the usual centrifugal type operated by means of a handle 10 associated with a shaft 11 geared to the other parts of the mechanism to obtain the high speed of rotation necessary for securing the proper separation of the milk into its component parts. As is customary with machines of this character, the one illustrated is equipped with a supply tank 12, from which the milk, when permitted, is adapted to flow through a pipe 13 into the top portion 14 of the separator. At its outer end,

the pipe 13 is in communication with a vertical tube 15, the lower end 16 of which is tapered, as illustrated in Fig. 2. This tube carries internally a valve 17 adapted by cooperation with the tapered portion 16 of the tube to establish and break communication between the tube 13 and the receptacle 14. The tube 15 also has within it a plunger or guide 18 connected to the valve 17 by a stem 19. The upper end of the tube 15 is equipped with a supporting bracket 20, on which is fulcrumed at 21 a lever 22, the end of which, disposed over the tube 15, is connected to the plunger 18 or stem 19 by a link 23, while the opposite end of the lever 22 is connected to a rod 24 having at its upper end a hook 25 adapted to engage a pin 26 at the end of the lever.

The separator shaft 27 projects laterally beyond the base or standard 28 of the machine, extending through an apertured boss 29 on the side of such standard. This shaft has fastened thereto a plate 30, to the opposite ends of which are pivoted, on pins 31, spaced ears 32, 32 of the pair of oppositely disposed weights 33, 33, spring-pulled toward one another by a pair of springs 34, 34, attached to the weights in any approved manner. It will therefore be apparent that as the shaft 27 is rotated during the operation of the separator by the turning of the handle 10, these pivoted weights will be acted upon by centrifugal force, and when the speed becomes sufficiently high to overcome the retracting action of the springs 34, the weights will separate, turning on their fulcrum pins 31, 31.

The outer end of the shaft 27 is journaled in a bracket 35, and between such bracket and the plate 30 there is provided a sleeve 36 rotatable with and also slidable on the shaft 27, being secured thereto by means of a key 37 fitting in keyways in the shaft 27 and the sleeve 36. At one end, this sleeve 36 is equipped with a pair of disk portions 38 and 39, between which are accommodated two pins 40, 40, secured to the ears 32 of the two weights 33, whereby the outward and inward swinging of these weights on their fulcrum pins 31 causes a longitudinal shifting of the sleeve 36 on its supporting shaft 27. In order to limit the inward turning of these weights on their fulcrums, each is provided with a stop screw 41, the inner end of which is adapted, in the retracted position of the weights, to bear on the outer surface of the

boss portion 42 of the sleeve. One face of this boss section 42 is beveled at 43, and at its opposite end the sleeve 36 is provided with an oppositely beveled disk member 44. Between these two beveled surfaces 43 and 44 another beveled disk 45 is accommodated, such disk being cut away on one side to provide a flat bearing surface 46. The disk 45 is fastened to the inner end of a shaft 47 revolvable in a bearing 48 fastened to or forming part of a lateral extension 49 of the bracket 35. At its other end, this shaft 47 has a collar 50 fastened thereto, to which the lower end of the rod 24 is pivotally connected by a screw 51.

The operation of this governing mechanism takes place substantially as follows: Assuming that the supply receptacle 12 is charged with milk and that the valve 17 prevents the flow of such fluid to the receptacle 14 by cooperating with the end 16 of the tube 15, it will be obvious that the valve 17 should not be permitted to open until the speed of operation of the separator is sufficiently high to assure the proper separation of the milk into its component parts. The operator, by grasping the handle 10 and gradually increasing its speed of rotation, will, after an interval, bring the centrifugal separator up to the proper speed to permit the feed of milk to the receptacle 14. While the mechanism is rotated at a speed less than such proper or normal speed, the valve 17 is maintained closed, the flat side 46 of the disk being in close approximation to the conical surface of the disk 44, and if for any reason the disk 45 should attempt to turn in such direction as to open the valve 17, its conical surface would at once contact with the surface 44, causing a rotation of the disk 45 in a direction to close the valve 17. In other words, so long as the speed of rotation is below that which is adequate for the separation of the liquid, the valve 17 will be maintained closed. As soon, however, as the proper speed is reached, the outward swinging of the weights 33 in opposition to the retracting action of their springs 34 will, by means of the coaction between the pins 40 and the disks 38 and 39, slide the valve 36 outwardly so as to bring the conical surface 43 into contact with the corresponding surface of the disk 45, and, owing to such frictional engagement, the latter disk will be turned, rotating the shaft 47 sufficiently to pull down the connecting rod 24, rock the lever 22 on its fulcrum 21, and lift the valve 17, permitting the milk to flow from the receptacle 12, through the pipe 13, into the chamber 14, from which it passes downwardly into the centrifugal separator proper. The valve 17 will be maintained open so long as the speed of rotation of the machine is up to or above the normal speed referred to. That is to say, the disk 45, by

frictional contact with the conical surface 43, will be rocked so as to open the valve, and when in this position the flat surface 46 will be adjacent to the conical surface 43, so that the valve will be maintained open without the surfaces 43 and 46 necessarily being in direct engagement. If, however, for any reason, the valve 17 should tend to close while the speed is at or above the normal, the disk 45 would be turned slightly so as to bring its conical, as distinguished from its flat surface, into engagement with the surface 43, and by such frictional contact the disk 45 would be turned back so as to maintain the valve open and again return the flat surface 46 opposite the conical surface 43. In other words, the valve 17 is mechanically and automatically maintained open so long as the speed is proper. If the speed decreases so as to be below that which is normal, then the inward movement of the weights 33 will shift the sleeve 36 inwardly, so that the disk 44 will engage the disk 45 and turn the latter through 180° so as to close the valve and bring the flat surface 46 opposite the disk 44 when the valve is closed.

It should be apparent, from the above description of the construction and operation of this mechanism, that the feed of liquid from the chamber 12 to the receptacle 14 is controlled solely by the speed of operation of the separator, and that the opening and closing of the valve 17 is entirely automatic and mechanically accomplished. That is to say, the opening and closing of the valve is secured by the rocking of the shaft 47 in one direction or the other, and this turning of the shaft is accomplished by bringing one or the other of the conical surfaces 43 or 44 into contact with the disk 45, the speed of rotation of the mechanism determining which of such conical surfaces shall at that time engage the disk 45, the movements of the members provided with such conical surfaces being brought about by the action of the centrifugally-controlled spring-retracted weights 33. In order to limit the swinging of the collar or member 50 beyond the proper points,—that is, to restrict its movement to 180°—I provide the extension 49 of the bracket 35 with a pair of stop pins 52 and 53, against which the member 50 is adapted to bear in the opposite limits of its oscillation. By employing a disk with the flat or cut away part, there is no resistance offered by the valve operating mechanism to the turning of the handle by the operator except during the opening and closing movements of the valve.

While I have herein described this invention as applied to a cream separator, it is to be understood that the invention is susceptible of employment in many different arts and relations, and that the structural features of the preferred embodiment herein

disclosed may be modified within comparatively wide limits without departing from the essence of the invention and without the sacrifice of any of its material benefits and advantages.

I claim as my invention:

1. In a liquid feeding governor construction of the character described, the combination of a centrifugal liquid separator, an inlet valve controlling the flow of liquid to the separator, and a governor adapted to actuate said valve and open the same only upon a predetermined speed of the separator.

2. In a liquid feeding governor construction of the character described, the combination of a centrifugal liquid separator, an inlet valve controlling the flow of liquid to the separator, and means permitting the opening of said valve only upon a predetermined speed of the separator.

3. In a liquid feeding governor construction of the character described, the combination of a centrifugal liquid separator, a valve controlling the flow of liquid to the separator, a disk connected to said valve, a pair of driving rotatable disks adapted to separately frictionally contact with opposite sides of the disk to open or close the valve, and a speed governor adapted to shift said driving disks to cause the one or the other to engage said valve disk.

4. In a liquid feeding governor construction of the character described, the combination of a centrifugal liquid separator, a valve controlling the flow of liquid to the separator, a valve disk operatively connected to said valve, a driving disk adapted to frictionally contact with said valve disk to turn the latter and operate the valve, and a speed governor adapted to shift said disks relatively to one another.

5. In a liquid feeding governor construction of the character described, the combination of a centrifugal liquid separator, an inlet valve controlling the flow of liquid to said separator, a valve disk operatively connected to said valve, a driving disk adapted to frictionally contact with said valve disk to turn the latter and operate the valve, one of said disks having a flat side, and a speed governor adapted to shift said disks relatively to one another.

6. In a liquid feeding governor construction of the character described, the combination of a centrifugal liquid separator, an inlet valve controlling the flow of liquid to the separator, means to revolve the separator, and a speed governor means to open and close said valve, said latter means offering no resistance to the operation of the separator revolving means except during the opening and closing movements of the valve, substantially as described.

7. In a liquid feeding governor construction of the character described, the combination of a centrifugal liquid separator, a valve controlling the flow of liquid to the separator, a disk connected to said valve, a pair of driving rotatable disks adapted to separately frictionally contact with opposite sides of the disk to open or close the valve, and a speed governor adapted to shift said driving disks to cause the one or the other to engage said valve disk, said first disk having a cut-away portion, substantially as described.

8. In a liquid-feeding governor of the character described, the combination of a centrifugal liquid separator, an inlet valve controlling the flow of liquid to the separator, and a revoluble governor rotated by the mechanism which operates the separator and adapted to actuate said valve and open the same only upon a predetermined speed of the separator, substantially as described.

9. In a liquid-feeding governor construction of the character described, the combination of a centrifugal liquid separator equipped with a supply reservoir, an inlet valve between said reservoir and separator adapted to establish and break communication between them, and means controlled by the separator and adapted to open said valve and maintain it open upon and above a substantially predetermined speed of the separator and to close said valve and maintain it closed at all speeds of the separator less than said predetermined speed, whereby the liquid supply flow to the separator is dependent upon the speed of the latter, substantially as described.

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