

June 9, 1931.

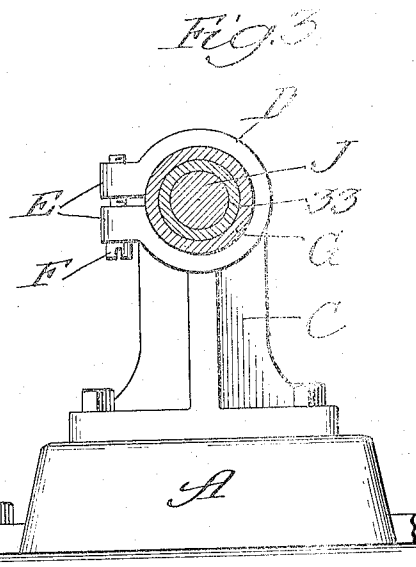
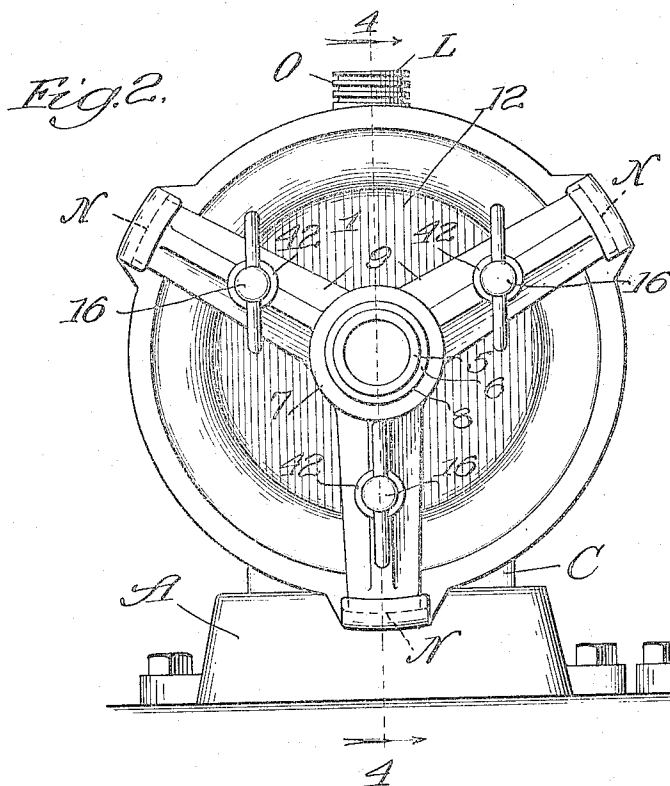
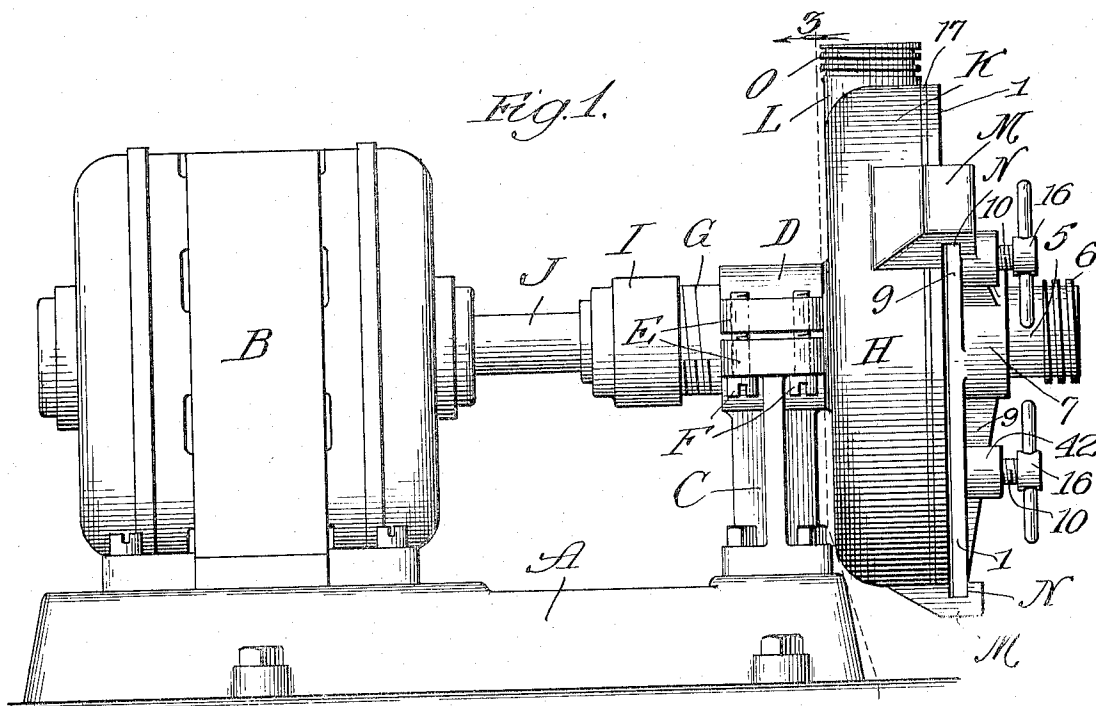
J. NAMUR

1,809,526

SANITARY CENTRIFUGAL MILK PUMP

Filed April 19, 1926

3 Sheets-Sheet 1



Inventor:
Joseph Namur,
By Dyrenforth, L. Critton & Niles,
Attorneys.

June 9, 1931.

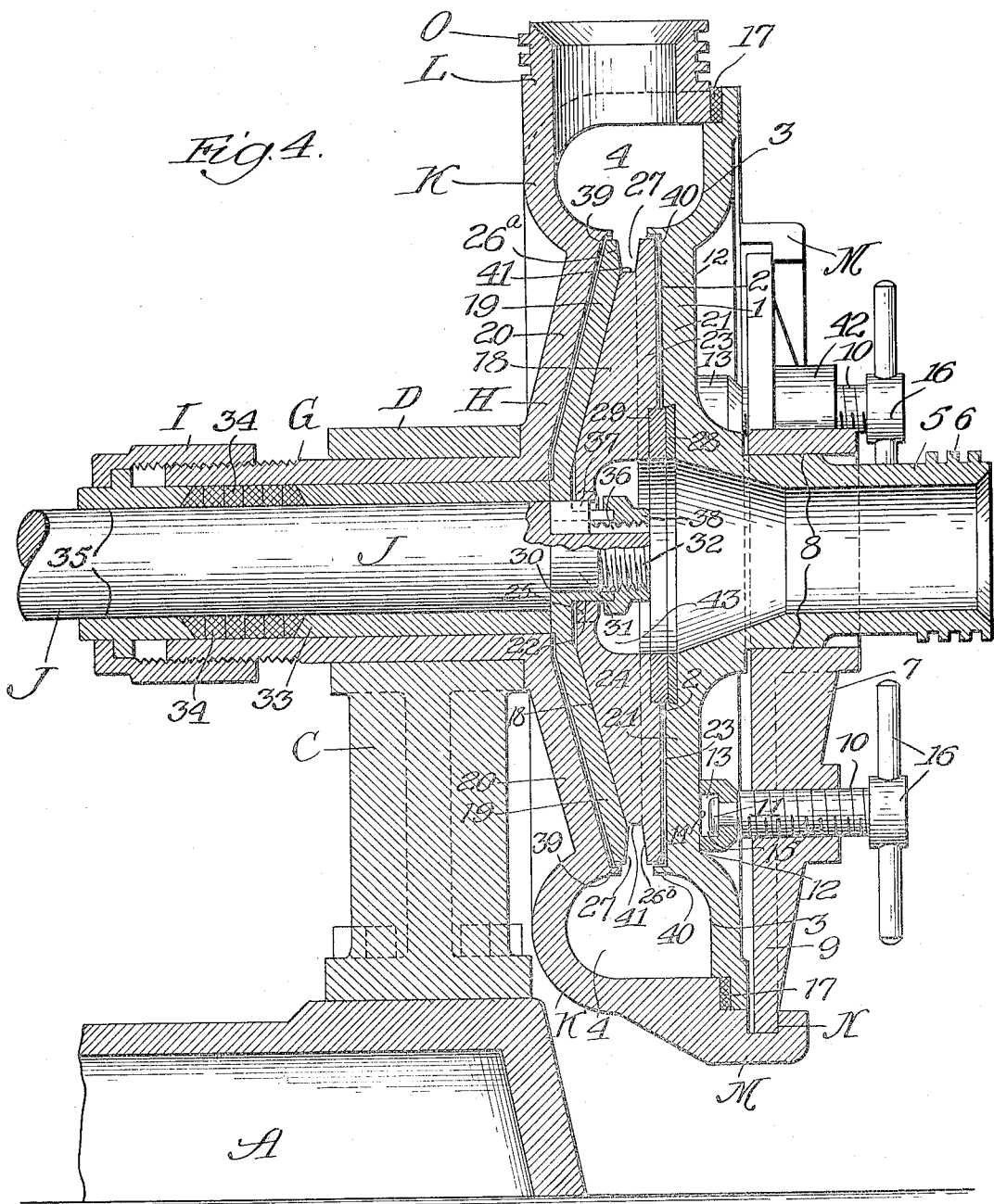
J. NAMUR

1,809,526

SANITARY CENTRIFUGAL MILK PUMP

Filed April 19, 1926

3 Sheets-Sheet 2



Inventor:
Joseph Namur,
By Dyrenforth, Lee, Chittor & Miles,
Attys.

June 9, 1931.

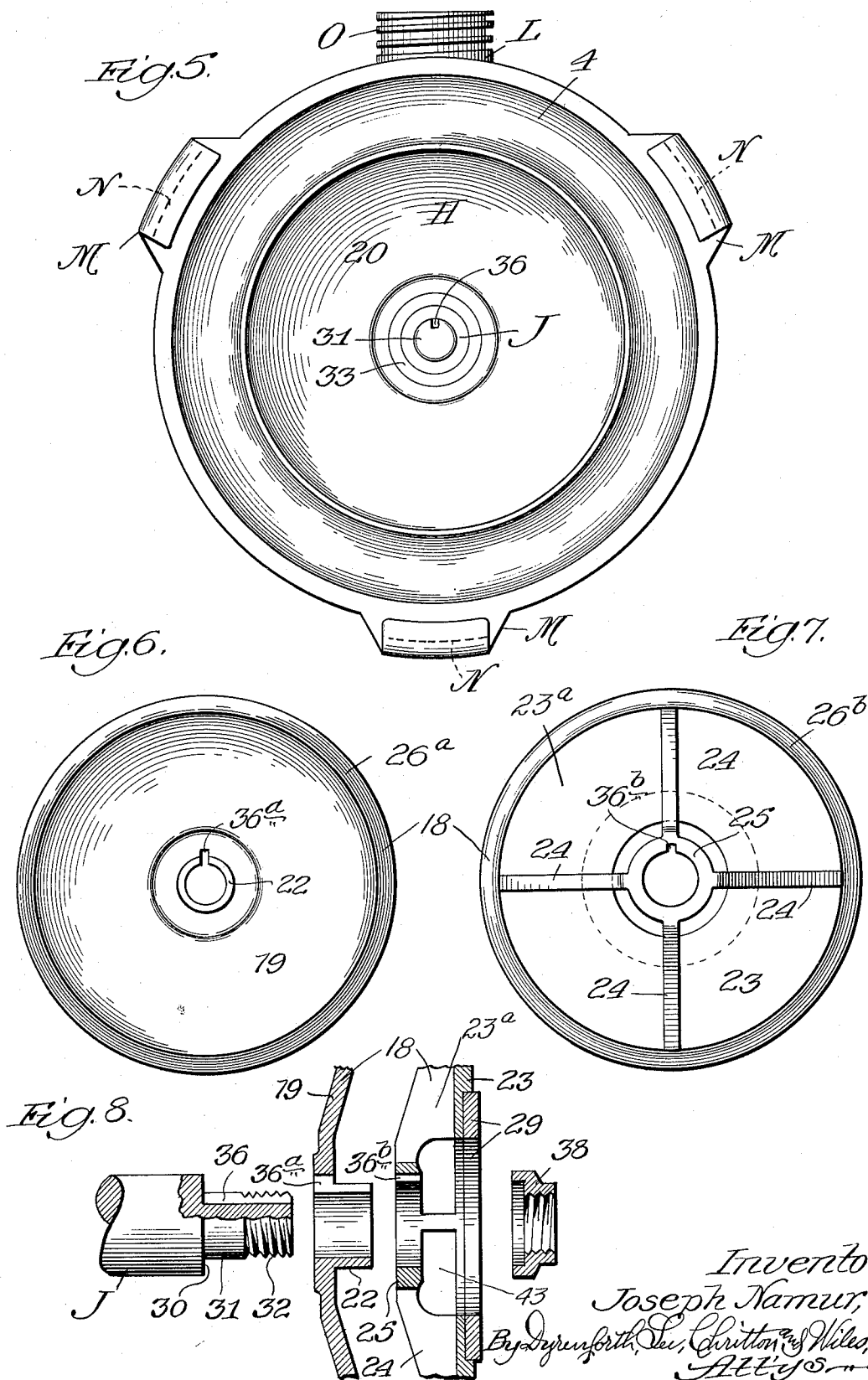
J. NAMUR

1,809,526

SANITARY CENTRIFUGAL MILK PUMP

Filed April 19, 1926

3 Sheets-Sheet 3



UNITED STATES PATENT OFFICE

JOSEPH NAMUR, OF KENOSHA, WISCONSIN, ASSIGNOR TO SPECIALTY BRASS COMPANY,
A CORPORATION OF WISCONSIN

SANITARY CENTRIFUGAL MILK PUMP

Application filed April 19, 1926. Serial No. 103,064.

This invention relates to improvements in sanitary centrifugal milk pumps. One of the primary objects of this invention is to provide a pump which will operate efficiently and at the same time act smoothly upon the material to be pumped so as to avoid any churning effect or breaking up of cream globules.

A further object is to provide a novel and improved pump construction which lends itself readily to adjustment and to such separation of parts as is required for absolute cleanliness.

It is a further object of the invention to provide means for ensuring against the intermingling of air and lubricant with the material which is being handled by the pump.

The invention is illustrated, in its preferred embodiment, in the accompanying drawings in which:

Figure 1, represents a side view in elevation of a pump constructed in accordance with the invention; Fig. 2, an end view in elevation; Fig. 3, a sectional view taken as indicated at line 3—3 of Fig. 1; Fig. 4, a section taken as indicated at line 4—4 of Fig. 2; Fig. 5, a front (inner) elevational view of the rear member of the casing; Fig. 6, a front (inner) view of the rear member of the impeller; Fig. 7, a rear (inner) view of the front blade-equipped member of the impeller; Fig. 8 a fragmentary view of the impeller parts in disconnected relation.

In the construction illustrated, A designates a base supporting a motor B and a standard C; D designates a clamping member provided with flanges E and with cap-screws F; G designates a sleeve casing member preferably formed integrally with the rear member H of the pump casing; J indicates an impeller shaft journaled in bearings in the motor B and sleeve casing G.

The rear member H of the pump-casing has an end wall 20 of general frusto-conical shape which is provided with an annular peripheral member K arcuately curved to provide a discharge chamber 4. The rear casing member H is provided with a radial outlet pipe L threaded at the discharge end O and with lugs or bosses M equipped with

channels or hooks N. With this construction, the rear casing member H and the sleeve member G may be rotated, for purpose of angular adjustment, and clamped in position by means of the cap-screws F in flanges E of the member D.

1 designates (Figs. 1, 2 and 4) a removable closure plate which has a plain inner surface 2 and outer surface 12. Beyond this surface 2 the closure plate may be formed to provide an outwardly curving wall section 3 complementary to wall section K and co-operative therewith to form chamber 4. The pump inlet comprises a tube 5 which may be cast integrally with the removable closure plate 1 and which is threaded at 6 to receive a coupling of any desired character.

A bridge member or spider 7 (Figs. 1, 2 and 4) is journaled on a cylindrical portion 8 of the inlet member 5 and is provided with arms 9, whose extremities engage the hooks N of bosses M. Threaded through a boss 42 on each arm 9 is a pressure screw 10, having a reduced inner extremity 11. The screw, upon which at 15 is swivelled a shoe 13 having a bearing surface 14, is preferably so positioned as to find a bearing near the circumference of the plane circular portion 12 of the closure plate 1. When the spider 7 is positioned as shown in the drawings so that its arms are engaged in the hook-shaped bosses M of the casing-member H, the screws may be turned to clamp the closure plate in position. An annular packing 17 is introduced between peripheral portions of the front and rear members of the pump casing.

Within the casing (Fig. 4) formed by the shell H and closure plate 1, is an impeller 18 so designed that it incloses the material acted upon by the pump until the material is discharged into the collecting chamber 4, thus preventing the milk from coming into contact with walls 20 and 21 of the casing. The impeller 18 is made up of the following parts: A rear plate 19, (Fig. 6) somewhat frusto-conical in shape conforming to wall 20 of the casing shell H and provided with a hub or sleeve 22; a forward plate 23 (Fig. 7); and a set of vanes or blades 24 which are preferably formed integrally with the front plate

23 of the impeller. For the purpose of the present disclosure I have shown the vanes 24 united at their inner ends to form a ring 25 which lies in a plane behind the front impeller plate 23. The shape of the blades 24 are such that when the impeller 18 is assembled, each blade will contact throughout its length with the dished or frusto-conical plate 19 of the impeller. While I have shown a radial arrangement of the impeller blades, the blades may be curved, since it is only necessary that the general direction of the blades be radial. The outer peripheral portions 26^a and 26^b of the impeller plates 19 and 23 are separated by an annular space 27 which preferably enlarges outwardly.

An annular disk 28 (Fig. 4) preferably made of steel, is inset in the inner face of closure plate 1 about the inlet 43 of the impeller, providing a recessed seat and a thrust bearing for a corresponding disk 29, preferably made of plastic bronze, inset in the outer face of the forward impeller plate 23 and extending forwardly therefrom.

The impeller shaft J is journaled within the casing sleeve G in a bearing 33, behind which is a packing 34 and a gland 35 which is held in position by the stuffing box nut I. The impeller shaft J is shouldered at 30 and the reduced extremity 31 is threaded at 32.

In assembling the impeller, the hub or sleeve 22 of the rear plate 19 (Figs. 4 and 8) is received over the reduced extremity 31 of the impeller shaft J and seats against shoulder 30. Ring 25 of the front impeller plate 23 is then received over the sleeve 22 of the rear plate 19. The impeller parts are provided with keyways, as indicated at 36, 36^a and 36^b, which when brought into register will permit the locking of the several parts by the insertion of a key 37 (Fig. 4). A nut 38 holds the key 37 in position. The entire impeller 18, as thus assembled, fits closely within the casing, the shell H and closure plate 1 being provided with internal annular shoulders at 39 and 40, which engage the outer peripheries of the impeller plates 19 and 23 respectively.

It is to be noted that the forward and rear plates 23 and 19 of the impeller converge toward each other in the direction of their peripheries. The impeller is so designed that the peripheral outlet 41 of the impeller 18 has an area which is substantially equal to or at least is not materially greater than the cross sectional area of the inlet port 43. It will also be understood from Figs. 7 and 8, that the impeller as described is provided with outwardly widening passages 23^a. It is preferred to keep the cross sectional area of the passages 23^a substantially uniform so that they may be always filled and thus avoid churning of the milk. In other words, the vanes 24 serve as compartment walls, the

milk being confined between these walls while passing through the impeller. Contributing also to the desired smoothness of the operation of this pump is the arrangement whereby the liquid is discharged radially from the impeller into the encircling annular passage-way 4.

The arrangement of the impeller parts and the manner in which the impeller inlet tube is fitted within the recess of the casing inlet prevents the liquid operated upon by the pump from entering the space between the impeller 18 and the casing walls 20 and 21. Furthermore, with this construction there is no tendency for the lubricant used in lubricating the bearing 33 to escape between impeller plate 19 and wall 20 of the casing.

From the inlet all milk is received into impeller 18 and is discharged from the impeller directly into chamber 4. In an ordinary centrifugal pump it is deemed important to have the discharge pipe tangential with reference to the pump casing. In the present pump, however, the discharge port is in reality the outlet of the impeller itself and the chamber 4 is merely a collecting ring which feeds pipe L. Pipe L, therefore, need not be tangential but may be radial or set at any angle.

The foregoing description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible in view of the prior art.

What I regard as new, and desire to secure by Letters Patent, is:

1. A rotary impeller for pumps, comprising a rear impeller plate provided with a hub which is adapted to be received over the end of a drive-shaft, a centrally recessed front impeller plate adapted to be received over said hub, blades between said plates, and means for releasably securing said plates to said shaft and to each other, said means comprising a key, alignable keyways in said shaft and impeller parts, and a nut in threaded relation with the end of said drive-shaft.

2. A rotary impeller for pumps, comprising a rear impeller plate provided with a hub which is adapted to be received over the end of a drive-shaft, a centrally recessed front impeller plate, vanes formed integrally with said front impeller plate and provided centrally with a ring which is adapted to be received over said hub, alignable keyways in said shaft, hub and ring, a key adapted to be received in said keyways, and a nut threadedly engaging the end of said drive-shaft and securing said key in position.

JOSEPH NAMUR.