Aug. 8, 1967 R. E. BELL 3,334,394

METHOD OF ASSEMBLING A PARTITION PLATE

Filed Nov. 20, 1962

Fig. 1.

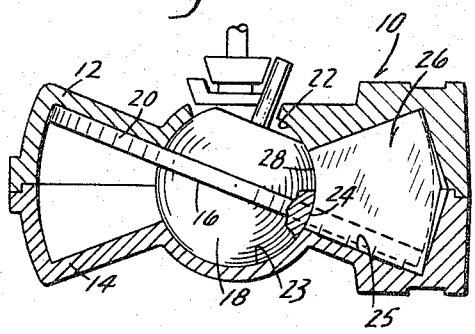


Fig. 2.

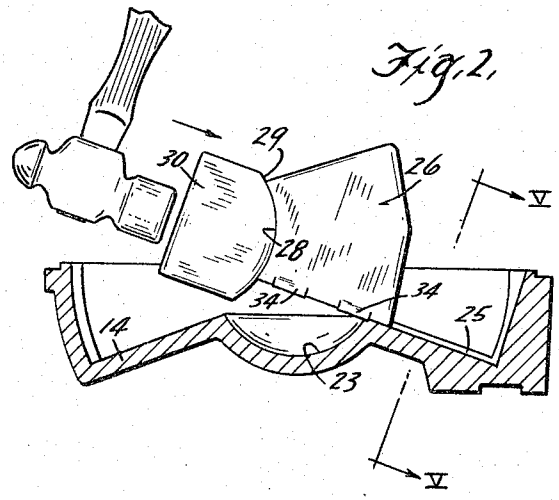


Fig. 3.

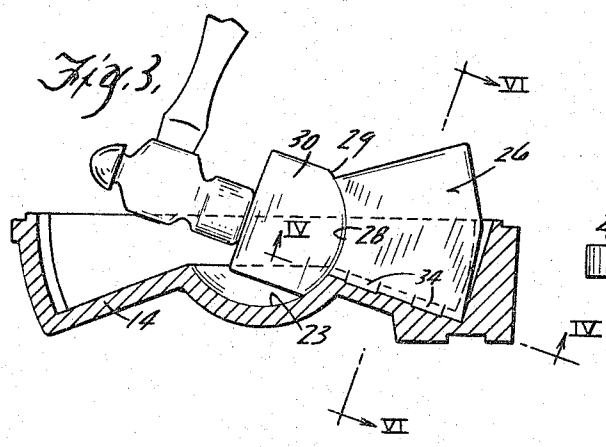


Fig. 4.

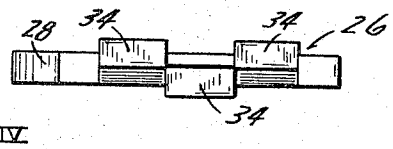


Fig. 5.

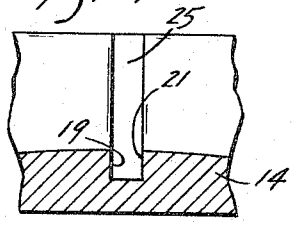
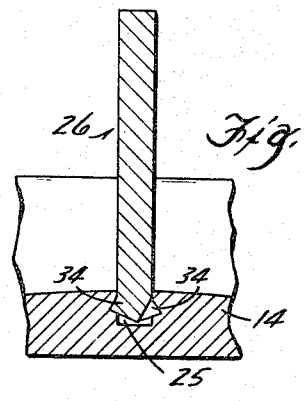


Fig. 6.



INVENTOR.
RICHARD E. BELL
BY
Gerald N. Tonkin
ATTORNEY

United States Patent Office 3,334,394
Patented Aug. 8, 1967

3,334,394

METHOD OF ASSEMBLING A PARTITION PLATE

Richard E. Bell, Mequon, Wis., assignor to Badger Meter Manufacturing Company, Milwaukee, Wis., a corporation of Wisconsin

Filed Nov. 20, 1962, Ser. No. 238,953
6 Claims. (Cl. 29—149.5)

This invention relates to meters and, more particularly, to a method of assembling a partition plate in the nutating disk chamber of a meter.

Heretofore, a partition plate has been assembled in the nutating disk chamber of a meter by inserting the plate in a slot provided in the chamber walls and applying a quantity of solder between the plate and the slot. The partition plate includes an arcuate face having a curvature corresponding to that of the spherical recesses provided in the nutating disk chamber walls to receive the spherical hub of the nutating disk. To insure conformance of and a flush juncture between the arcuate face of the partition plate and the spherical recesses the partition plate is machined subsequent to assembly in the chamber.

An object of this invention is to provide a simplified and economical method of assembling the partition plate in the nutating disk chamber.

Another object of this invention is to provide an improved method of making connection between the partition plate and the wall of the nutating disk chamber.

For the achievement of these and other objects, it is proposed to form the arcuate face in the partition plate prior to assembling the plate in the nutating disk chamber. The curvature of the face is made to conform generally to the curvature of the spherical recesses in the nutating disk chamber. An interference fit is provided between the plate and the walls defining the slot in the chamber walls and a tool having a face conforming to the arcuate face of the partition plate is engaged with that arcuate face and a force is applied through that member to the partition plate to securely seat the plate in the slot provided in the chamber wall. The tool is arranged so that its curved face extends beyond the arcuate face of the partition plate for engagement with the spherical recess to limit the seating movement of the partition plate and to properly align its arcuate face to form a flush juncture with and a continuation of the arcuate surface of the spherical recesses. The interference fit is preferably provided by projections formed in the partition plate and arranged to engage the walls defining the slot in the chamber.

Other objects and advantages will be pointed out in, or be apparent from, the specification and claims, as will obvious modifications of the embodiment shown in the drawings, in which:

FIG. 1 is a partial section through the nutating disk chamber of a meter;

FIGS. 2 and 3 illustrate the partition plate in different stages of assembly;

FIG. 4 is a view of the partition plate taken generally along lines 4—4 of FIG. 3;

FIG. 5 is a section through the nutating disk chamber wall taken generally along lines 5—5 of FIG. 2 and prior to insertion of the partition plate; and

FIG. 6 is a section taken generally along lines 6—6 of FIG. 3.

With particular reference to the drawings, a nutating disk chamber **10** for a liquid flow meter is formed by upper and lower chamber portions **12** and **14**. A nutating disk **16** includes a generally spherical hub **18** and a planar portion **20** with hub **18** being seated in spherical recesses **22** and **23** provided in the upper and lower

chamber portions **12** and **14**. A notch **24** is provided in the planar portion **20** of the nutating disk to accommodate partition plate **26** which is fixedly seated within the nutating disk chamber. As is well known in the art, nutating disk **16** is moved by the flow of the liquid to be measured through the meter.

The construction of the nutating disk chamber and the nutating disk together with their arrangement with the partition plate are well known and this invention is directed to a particular partition plate construction and its method of assembly in the nutating disk chamber. As previously discussed, the well-accepted practice to date has been to insert the partition plate into a slot **25** formed in lower housing portion **14** and to solder the plate in place. A face **28** is then machined in the partition plate with a curvature corresponding to that of spherical recesses **22** and **23** to form a flush juncture with and extension of the spherical recesses. Upper housing portion **12** may also be provided with a partition plate receiving slot (not shown).

In accordance with this invention the partition plate **26** is punched, or otherwise suitably machined, to provide, prior to its assembly in the nutating disk chamber, arcuate face **28** having a curvature which conforms to that of the spherical recesses. The pre-formed plate is assembled in the lower housing portion **14** by placing face **29** of a tool **30** in engagement with arcuate face **28** and applying a force to the partition plate through the tool to securely seat the partition plate in the slot. Face **29** has a curvature which conforms to that of arcuate face **28** and the spherical recesses, and the tool is arranged relative to the partition plate and the lower housing portion **14** such that face **29** extends beyond the termination of the arcuate face so that a portion of recess **23** is positioned in the path of the tool. In this manner the tool sets the partition plate in place and also acts as a stop to limit the movement of the partition plate and properly align it to provide a flush juncture with and a continuation of the recesses in the chamber walls.

To securely seat the partition plate in its aligned position, a forced or interference fit is provided between the partition plate and slot **25**. The partition plate is thereby self-seating and obviates the need for any additional form of attachment to secure it in the chamber. Preferably the interference fit is provided by tabs **34** formed along the lower edge of the partition plate.

Tabs **34** project laterally of partition plate and define a transverse dimension which is greater than the distance between walls **19** and **21** defining slot **25** so that when the partition plate is driven into and along the slot the tabs cut into walls **19** and **21** to securely seat the partition plate in place.

In accordance with this invention, the partition plate is self-seating and will hold the particular position established for it by tool **30** and in one operational step can be assembled and securely seated in the nutating disk chamber while providing a flush juncture with and a continuation of the spherical recesses in upper and lower housing portions **12** and **14** and without the need for any machining operation subsequent to assembly of the partition plate.

Although the present invention has been illustrated and described in connection with but one embodiment thereof, it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit of the invention or from the scope of the appended claims.

What I claim is:

1. In the method of manufacturing the nutating disk chamber of a meter wherein the walls defining said chamber include means for receiving a partition plate and also include a generally spherical recess for receiving the

spherical hub of a nutating disk, the improvement comprising the steps of, prior to assembly of the partition plate in said chamber, forming a face on said partition plate to a curvature conforming generally to that of said spherical recess, engaging said face of said plate with an arcuate member the curvature of which conforms generally to that of said face, and applying a force through said arcuate member to said plate to engage said plate in said partition plate receiving means.

2. In the method of manufacturing the nutating disk chamber of a meter and wherein the walls of said chamber include means for receiving a partition plate and also include a generally spherical recess for receiving the spherical hub of a nutating disk, the improvement comprising the steps of, prior to assembly of the partition plate in said chamber forming a face on said partition plate to a curvature conforming generally to that of said spherical recess, engaging said face of said plate with an arcuate member the curvature of which generally conforms to that of said recess, and applying a force to said plate through said arcuate member to drive said plate into said partition plate receiving means until said arcuate face is aligned flush with and forms a continuation of said recess.

3. The method of claim 2 including the step of forming an interference fit between said plate and said partition plate receiving means as said plate is driven thereinto.

4. In the method of manufacturing the nutating disk chamber of a meter and wherein the walls defining said chamber include a slot for receiving a partition plate and also include a generally spherical recess for receiving the spherical hub of a nutating disk, the improvement comprising the steps of, prior to assembly of the partition plate in said chamber forming an arcuate face on said partition plate to a curvature conforming generally to that of said spherical recess, engaging said arcuate face with a member having a curved face conforming generally to that of said arcuate face, applying a force to said partition plate through said member to drive said plate into said slot, and positioning said member so that its curved face extends beyond said arcuate face for engagement with said spherical recess to limit the travel of said

partition plate in said slot and align said arcuate face flush with and to form a continuation of said recess.

5. The method of claim 4 including the step of forming an interference fit between said plate and the walls defining as said plate is driven into said slot.

6. In the method of manufacturing the nutating disk chamber of a meter and wherein the walls defining said chamber include a generally spherical recess for receiving the spherical hub of a nutating disk and an elongated slot extending generally radially of said recess, the improvement comprising the steps of, prior to assembly of the partition plate in said slot forming an arcuate face on said partition plate to a curvature conforming to that of said recess, forming at least one projection adjacent the slot engaging end of said plate and extending laterally with respect to said plate, engaging said arcuate face with a member having a face the curvature of which conforms generally to that of said recess, positioning said member so that its curved face extends beyond the arcuate face of said partition plate so that said recess is disposed in the path of said member to limit the travel of said partition plate in said slot, and applying a force to said plate through said member to drive said plate into said slot until the curved face of said member engages said recess to align said arcuate face flush with and form an extension of said recess.

References Cited

UNITED STATES PATENTS

696,692	4/1902	Nash et al.	73—272
1,762,949	6/1930	Bassett	73—272
1,880,195	10/1932	Chrisman	73—272 XR
1,885,137	11/1932	Pickard	29—432
1,903,074	3/1933	Weymouth	73—272
2,159,892	5/1939	Hanks	73—272 XR
2,635,328	4/1953	Larmour	29—525
2,673,390	3/1954	Broberg	29—432
2,740,501	4/1956	Wright	29—525 XR
2,758,516	8/1956	Prevost et al.	29—525 XR
2,799,127	7/1957	Sunnen	29—432 XR

CHARLIE T. MOON, *Primary Examiner.*

WHITMORE A. WILTZ, *Examiner.*