This invention relates to valves for receptacle closures and particularly to the embodiment of such valves in receptacles of the type used for dispensing cement, paste, solvents or other liquids used in manufacturing processes where it is important to prevent losses by waste and evaporation. An important field of use for my invention is in connection with the dispensing of such liquids as are used in resurfacing operations. Not only does the use of dispensing valves have the advantage of retaining the valve in its operative position with respect to a receiving tray and with the valve open; a momentary lift on the valve stem permits the complete and convenient disassembly of the parts when desired so that each may be separately and thoroughly cleaned. As herein shown, the guiding members already mentioned are novel means for guiding said member in a predetermined path to and from the opening thus preventing misplacement or cramping of the valve and so insuring reliable action thereof. One satisfactory construction operating to produce the desired results consists, as illustrated, of a pair of posts or other elongated guiding members secured upon the plate, projecting upon either side of the valve seat opening and having a guiding connection with the valve member.

In adapting the valve of a receptacle closure for use with volatile solvents or liquids containing such solvents, it is inevitable that residual matter should be deposited upon parts of the valve, particularly those parts which are immersed in the liquid. With such conditions in view the present invention contemplates a valve so constructed and arranged that all its parts are maintained in assembled operative position by detachable means permitting the complete and convenient disassembly of the parts when desired so that each may be separately and thoroughly cleaned. As herein shown, the guiding members already mentioned are utilized to position and detachably engage a bridge member which has the functions of not only retaining the whole assembly in operative relation, but of guiding the valve spindle and of so cooperating with the spring means which act on the valve member itself to insure accurate control of the latter in all positions thereof.

These and other features of the invention will be best understood and appreciated from the following description of a preferred embodiment thereof, selected for purposes of illustration and shown in the accompanying drawing, in which:

Fig. 1 is a view in elevation, partly in section, showing a receptacle equipped with the closure in its operative position with respect to a receiving tray and with the valve open;

Fig. 2 is a fragmentary view partly in vertical section and on a larger scale showing the valve in closed position; and

Fig. 3 is a view in perspective showing the parts of the closure in separated relation.

The valve embodying my invention is herein illustrated as applied to a closure for a glass jar of a capacity of one or two quarts and having a wide mouth formed with an exterior thread thereon. Such a jar is suitable for containing and distributing latex or rubber cement and its contents may be assumed to be any liquid of that character. The closure is adapted to be screwed on the threads of the jar and comprises a cap plate with a self-contained valve member incorporated therein and is adapted to be attached to or removed from the receptacle as a complete unit. The body of the closure is formed of sheet metal and comprises a sleeve portion provided with an interior thread to fit the thread of the jar. The sleeve of the closure merges into a flat bottom cap plate which is provided with a concentric valve opening, the margin of which is formed as a down-turned flange having a convex annular surface which constitutes the valve seat.

A pair of guide members, comprising posts, are permanently secured to the cap plate, as by being riveted therein. The posts are located diametrically upon opposite sides of the valve opening and project upwardly into the mouth of the jar when the cap plate is in position, as shown in Figs. 1 and 2. Each of the posts is provided at its inner end with a reduced neck and a larger cylindrical head, for purposes which will be presently described.

The valve member comprises a cupped sheet metal body, circular in cross section and tapering and provided with an outer curved surface of the proper dimensions to fit snugly within the valve opening upon the valve seat. This provides an effective seal against the escape of liquid when the valve is closed, while having a minimum area of contact between the valve member and the valve seat so that there is no danger of the valve becoming "frozen" due to coagulation of the cement. The valve member extends outwardly beyond the periphery of the valve seat and is provided with diametrically located...
notches or recesses 28 shaped to engage the posts 18 so that a guiding relation is established between the posts and the valve member, the valve member being prevented from rotating or from being transversely displaced by the engagement of the recesses 28 with the sides of the posts. The valve member also includes a spindle having an elongated portion 24 of reduced diameter and a mushroom-shaped portion 25 of larger diameter. The spindle is rigidly secured to the valve member 22 by being forced through the latter until the upper shoulder of the head 26 engages the outer surface of the valve member.

Extending between the inner ends of the posts 18 and detachably secured thereto is a bridge member 30 which has the functions of guiding the inner end 24 of the spindle in the movement of the valve, serving as an abutment for a spring 36, and of maintaining the valve spring 38 in place.

The bridge member is provided at its ends with oppositely opening countersunk sockets 34 which are shaped to pass over the reduced necks of the posts 18 and to receive the enlarged heads 20 thereof. At either side the bridge member is provided with a down-turned flange 36 which serves to engage the valve spring and to retain it in a central position. The valve spring 38 is a coil compression spring and is arranged concentrically about the spindle, being held in place at its lower end by the inner walls of the cupped valve member 22 and at its upper end similarly positioned by the down-turned flanges 36 of the bridge member 30. The valve spring 38 tends at all times to seat the valve but will yield to permit opening of the valve when the spindle head 26 is pressed inwardly. In assembling the device, the bridge member is positioned upon the reduced portion 24 of the spindle and forced downwardly against the compression spring 38 to a position in which the side openings of the sockets 34 may be registered with the reduced neck portions of the posts. The bridge member is then swung so as to bring the sockets into line with the heads 20 and upon being released the valve spring 38 will seat the bridge member in position and yieldingly maintain it therein. When it is desired to detach the bridge member for the purpose of removing the valve parts for cleaning or renewal, the bridge member is depressed and turned in an unlocking direction, whereupon the valve member and its spring are free to be detached from the cap plate, as shown in Fig. 3. This operation, of course, is performed when the cap plate has been removed from the receptacle so that the bridge member may be conveniently reached.

The jar 10 is shown as mounted in a fixture comprising a frame 40 having circular members arranged to surround the jar and provided with spaced cushion studs 42. The fixture is provided with a clamping member 41 by which the whole assembly may be supported in convenient position upon or adjacent to a work bench or a machine by means of a standard or bracket, not shown. The fixture includes a shallow tray or pan 44 adjustable supported by a shank member 45 which enters a socket in the fixture. The fixture is further provided with a bent arm 46 which projects downwardly and inwardly into alignment with the head 26 of the spindle and in a position to engage and depress the same so as to open the valve. In use the jar 10 is placed in the fixture. As shown in Fig. 1, the spindle has been depressed to open the valve against the compression spring 38 and the contents of the jar have flowed into the pan 44 up to the level of the valve seat flange 45. Having once established this relation, the liquid is maintained at a predetermined level until the valve parts the bridge member is then exhausted. When the jar is lifted out of its fixture, the spring 38 immediately seats the valve closing the receptacle. Assuming that the jar has been inverted, the closure may then be unscrewed from the jar and if it is desired to clean the jar the lid is removed and the pan 44 is removed as above explained and the parts of the assembly disengaged and released for removal.

When the jar is to be again used, it is filled while the closure is removed and then, the closure having been replaced and the jar inverted, the valve remains closed as shown in Fig. 2 so that the jar may be placed in its fixture and in proper relation to the tray 44 without danger of spilling or waste. It will be apparent that the valve provides a liquid-tight seal for the jar so that the latter may be used for storage purposes without loss by evaporation, at the same time being in readiness for instant use.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A valve comprising a plate having a valve opening therein, upright posts on the plate adjacent to said opening, a sheet metal cupped valve member shaped to fit said opening and having a rim of larger diameter provided with recesses 28 shaped to engage the posts 18 so that a guiding relation is established between the posts and the valve member, a compression spring for seating the valve member and also maintaining the bridge member interlocked with the heads of said posts.

2. A valve comprising a plate having a valve opening therein, upright guide members projecting from one side of the plate upon opposite sides of said opening, a valve member having a surface fitting the wall surrounding the opening and a periphery of greater diameter than said opening, a valve seat flange shaped to engage said guide members, an abutment carried by said guide members, and a spring removably positioned between said abutment and said valve member acting to seat the latter.

3. A valve comprising a plate having a valve opening therein, posts permanently secured on one side of the plate and located near the edge of said plate, a valve member having a periphery of greater diameter than said opening, a valve member comprising a body for filling said opening and a centrally disposed spindle, a bridge member detachably secured in place upon the free ends of said posts and having a guiding relation to said spindle, and a spring tending to seat the valve.

4. A valve comprising a plate having a circular valve opening therein with an out-turned flange affording a valve seat, posts projecting from one side of the plate outside the periphery of said flange, a valve member for filling the valve seat and movable freely between and guided by said posts, a bridge member detachably locked to said posts in a position remote from the valve seat and having spring-retaining means therein, and a valve spring interposed between the bridge member and the valve member.

5. A valve comprising a plate having an opening therein the wall of which forms an annular valve seat, a pair of posts secured to the plate and projecting from one side on opposite sides of the valve seat and each having a head at its inner end, a receptacle for the jar placed in the fixture, the heads of said posts arranged to fit said heads, a valve member, and an interposed spring for seating the valve member and also maintaining the bridge member interlocked with the heads of said posts.
6. A valve comprising a plate having an opening therein, a valve member adapted to close said opening having a spindle concentric with said opening, posts projecting from the plate on opposite sides of the opening in symmetrical relation to the valve member and each provided with a locking head, and a removable spindle guiding member having a centrally disposed opening to receive the spindle and oppositely disposed sockets equally spaced from said opening and arranged to be interlocked with said heads by a turning movement of the spindle guiding member.

7. A valve comprising a flat plate with a concentric valve opening therein, upright posts projecting from the plate at points adjacent to the valve opening, a valve member normally closing said opening and having recesses in its periphery to receive said posts in a guiding relation, a holder detachably secured between the inner ends of said posts and provided with spring-retaining flanges, a valve spindle secured to the valve member and guided in said holder, and a compression spring encircling said spindle and retained in place between the valve member and said flanged holder.

EUGENE J. RAY.