To all whom it may concern:

Be it known that I, Sidney Hole, a subject of the King of England, residing at Hassocks, Sussex, England, have invented certain new and useful Improvements in Closure Means for Milk Churns, of which the following is a specification.

This invention is for improvements in or relating to closure means for milk churning.

As is well known, the closure means commonly employed for milk churns frequently works loose so that the closing lid becomes detached from the churn, and few, if any, of them are fluid-tight.

According to the present invention, the closure means for the milk churn comprises a lid which co-operates with the mouth portion of the vessel to be closed, one of these parts being a male element and the other a female element, characterized by the male element having in its engaging surface two parallel circumferential grooves, the female element having in its engaging surface a groove which registers with that groove which is second from the entering end of the male element, and a ring of elastic material such as rubber, preferably of circular cross-section placed in the first groove of said male element, the said ring and grooved parts being of such dimensions that when the lid is forced into position, the ring will roll from the first groove into the second groove where it will engage the groove in the female element and serve to key the two parts together.

Preferably, the entering portion of the lid has a flange below the grooves nearest the entering end which is of a larger diameter than the part situated between the grooves to prevent displacement of the rubber ring from the said end when the lid is being removed, and a single groove is provided in the mouth of the churn which registers, when the lid is in the closing position, with that groove farthest from the entering end of the lid.

A further feature of this invention consists in making provision for the insertion of levers between the mouth of the churn and an overhanging portion of the lid, for example the usual outwardly directed flange, so that the lid can be levered off the churn.

Another feature of the invention consists in providing closure means of the kind set forth above characterized by one or more concealed spring-catches carried by the lid or within the mouth of the vessel, each catch having a shouldered cam-portion, by the other element, say the mouth of the vessel, having a circumferential lip so situated and dimensioned that as the lid is pushed into position the said lip will have sliding engagement with the cam-portions of the catches until it becomes locked behind the shouldered portions thereof, and by recesses provided in the lid or vessel or both, whereby one or more implements can be introduced to thrust back the spring-catches when the lid is to be released.

In the accompanying drawings which illustrate one method of carrying out this invention as applied to a milk churn,

Figure 1 is a central vertical section through the top of a churn, and half of the lid is also shown in central vertical section, the parts being in the position they occupy prior to the closure being effected;

Figure 2 shows the same parts in section as in Figure 1, but in the closed position;

Figure 3 is a vertical section through one side of a churn and its lid, illustrating on a larger scale a detail shown in Figures 1 and 2, and

Figure 4 is a face view of the side portion of the lid carrying a locking device. Like reference letters indicate like parts throughout the drawings.

The usual churn body is indicated at A, and the mouth portion B is flared somewhat after the usual manner. At the smaller portion of this flared mouth a groove B1 is provided, and above the groove is a lip B2 which restricts the throughput of the mouth to approximately the same diameter as that of the part B3 which lies below the groove.

The lid C is of tapered construction, and has a central well, and in this respect is similar to churn lids at present employed, but the part C1 is made approximately parallel and contains two circumferential grooves C5 and C6 respectively. The groove C5 is toward what may be called the leading end of the lid, as it is that end which enters first when the lid is applied, and beyond the groove is a flange C6 which is made as large in diameter as possible to prevent accidental detachment of a rubber ring D which operates in the grooves C5, C6.

When the lid is about to be applied, the parts take the position shown in Figure 1, that is the ring D lies in the lower groove
C is nearest the leading end of the lid, and when the lid is laid loosely in position the ring will bear against the lip B. If now the lid is forcibly driven down the ring D will be distorted and will roll between the engaging surfaces of the lid and the mouth of the churn so that it will pass out of the groove C into the groove C', and at the same time will roll over the lip B' into the groove B' of the churn. In this position it will serve as a key to hold the lid firmly in position, and as it is sufficiently large in diameter to rather more than fill the grooves C' and B', it will be under compression, and will thus make a fluid-tight joint between the lid and the mouth of the churn.

The lid has an outwardly turned flange E which bears against the top of the churn and thus limits the degree of downward movement, and for many purposes the ring affords all the necessary security for the lid, in fact it has been found that the churn can be lifted by the handle F without any displacing action of the ring D taking place to release the lid. To enable the lid to be withdrawn, lateral recesses E' are provided in its edge at two opposite points, so that short levers can be inserted therein and the lid can be prised up sufficiently to roll the rubber ring D back into the groove C' and out of the groove B'. The parts will then again be in the position shown in Figure 1 and the lid can be lifted free of the churn.

The flange C is intended to prevent accidental displacement of the rubber ring from the lid when the lid is off the churn.

If further locking of the lid is required, the mouth of the churn may be provided with an internal lip G which is continuous round the mouth, and the lid may carry spring-catches in the form of locking tongues H for co-operation with this lip. It will be seen that when the lid is in the closing position as shown in Figure 2, shoulders H' on the spring tongues lie beneath the lip G and thus positively lock the lid against removal but the tongues are placed opposite the recesses E' and extend beyond the lip G into these recesses so that when the levers for prising up the lid are introduced, the tongues can be pressed back to free the shoulders H' from the lip G, and then the lid can be prised up as already described.

What I claim as my invention and desire to secure by Letters Patent is:

1. In a milk churn of the character described, the combination of a body portion in the form of a can, a lid having a cylindrical wall adapted to enter with play into the mouth of the body portion, and having two parallel circumferential grooves separated by a rib, whereof the first groove is nearer to and the second groove is more remote from the entering-end of the lid, the said mouth of the can having an internal peripheral groove arranged to register with the said second groove when the lid is in its closed position, and an elastic closure ring seated in the first groove in the lid prior to applying the lid and movable over said rib into the second groove and adapted to enter, in the closed position of the lid, said internal groove, the said ring and grooves being of such dimensions that when the lid is forced into its closed position, the ring will roll from the first groove in the lid into the second where it will engage said internal groove and serve to key the lid in its closed position, said lid further having below the first groove a flange of a diameter substantially larger than that of said rib, which flange serves to prevent displacement of the closure ring from off the bottom of the lid when the can is being opened and when the lid is off.

2. In a receptacle, the combination of an element constituting the body portion thereof, a second element constituting a lid having a cylindrical wall adapted to enter with play into the mouth of the body portion and having two parallel circumferential grooves separated by a rib whereof the first groove is nearer to and the second groove is more remote from the entering-end of the lid, the said mouth of the can having an internal peripheral groove arranged to register with the said second groove when the lid is in its closing position, and an elastic closure ring seated in the first groove in the lid prior to applying the lid, and movable over said rib into the second groove and adapted to enter, in the closing position of the lid, into said internal groove, the said ring and grooves being of such dimensions that when the lid is forced into its closing position, the ring will roll from the first groove in the lid into the second where it will engage said internal groove and serve to key the lid in its closing position, said lid having below the first groove a second rib of a diameter larger than that of said rib, which second rib serves to prevent displacement of the closure ring from off the bottom of the lid when the can is being opened, one of said elements having a continuous peripheral lip, and a spring-catch mounted on the other of said elements and arranged automatically to engage said lip in the closing position of the lid, and one of said elements having a recess opposite to the said catch for the insertion of an implement for disengaging the catch from the said lip.  

3. In a receptacle, the combination of an element constituting the body portion thereof, a second element constituting a lid having a cylindrical wall adapted to enter with play into the mouth of the body portion, and having two parallel circumferential grooves separated by a rib, whereof the first groove is nearer to and the second groove is more remote from the entering-end of the lid, the said mouth of the can having an internal peripheral groove arranged to register with the said second groove when the lid is in its closed position, and an elastic closure ring seated in the first groove in the lid prior to applying the lid and movable over said rib into the second groove and adapted to enter, in the closed position of the lid, said internal groove, the said ring and grooves being of such dimensions that when the lid is forced into its closed position, the ring will roll from the first groove in the lid into the second where it will engage said internal groove and serve to key the lid in its closed position, said lid further having below the first groove a flange of a diameter substantially larger than that of said rib, which flange serves to prevent displacement of the closure ring from off the bottom of the lid when the can is being opened and when the lid is off.
remote from the entering-end of the lid, the said mouth of the can having an internal peripheral groove arranged to register with the said second groove when the lid is in its closing position, and an elastic closure ring seated in the first groove in the lid prior to applying the lid, and movable over said rib into the second groove and adapted to enter, in the closing position of the lid, into said internal groove, the said ring and grooves being of such dimensions that when the lid is forced into its closing position, the ring will roll from the first groove in the lid into the second where it will engage said internal groove and serve to key the lid in its closing position, said lid having below the first groove a second rib of a diameter larger than that of the first said rib, which second rib serves to prevent displacement of the closure ring from off the bottom of the lid when the can is being opened, the mouth of said body portion having a continuous internal peripheral lip, spring-catches, each having a shouldered cam-portion, carried by the lid and arranged automatically to engage said lip with the cam-portions when the lid is pushed into its closing position and lock the lid against removal, one of said elements having recesses, one opposite each spring-catch, for the insertion of an implement for disengaging the catches from said lip.

4. In a milk churn of the character described, the combination of a vessel having a mouth portion in the form of a cone, a lid having a cylindrical wall adapted to lie concentrically with said mouth portion, which said mouth portion and lid constitute one a male element and the other a female element cooperating therewith, which male element has two parallel circumferential grooves separated by a rib, whereof the first groove is nearer to and the second groove is more remote from the entering-end of the male element, said female element having an internal peripheral channel in the form of a groove arranged to register with said second groove when the lid is in its closed position, and an elastic closure ring seated in the first groove in the male element prior to applying the lid and movable over said rib into the second groove and adapted to enter, in the closed position of the lid, said channel, the said ring and grooves being of such dimensions that when the lid is forced into its closed position, the ring will roll from the first groove in the male element into the second where it will engage said channel and serve to key the lid in its closed position, said male element further having at the entering side of the first groove a flange of a diameter larger than said rib for preventing displacement of the closure ring from off the entering-end of the male element when the can is being opened and when the lid is off.

In testimony whereof I affix my signature.

SIDNEY HOLE.