

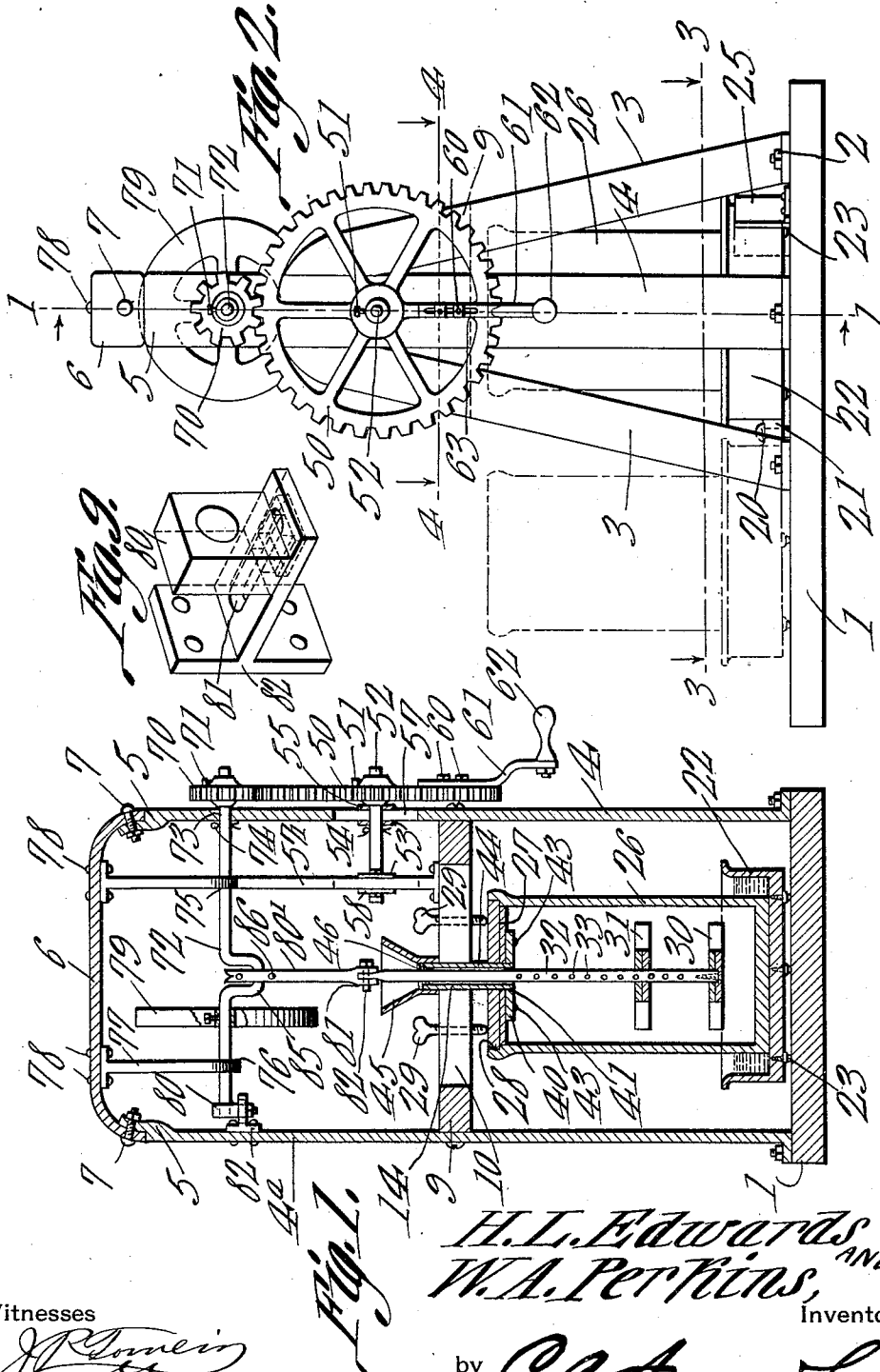
H. L. EDWARDS & W. A. PERKINS.
CHURN.

APPLICATION FILED MAY 15, 1911.

Patented Oct. 10, 1911.

2 SHEETS—SHEET 1.

1,005,421.



Witnesses

J. H. Wilson
J. H. Wilson.

H. L. Edwards
W. A. Perkins, AND

Inventor

by

C. A. Snow & Co.

Attorneys

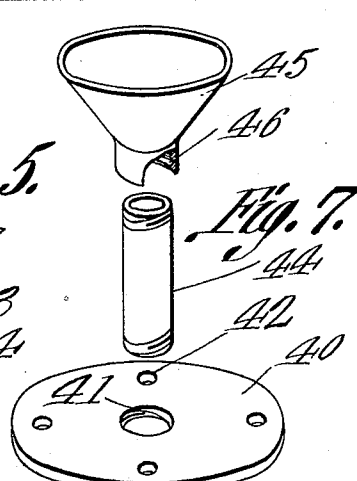
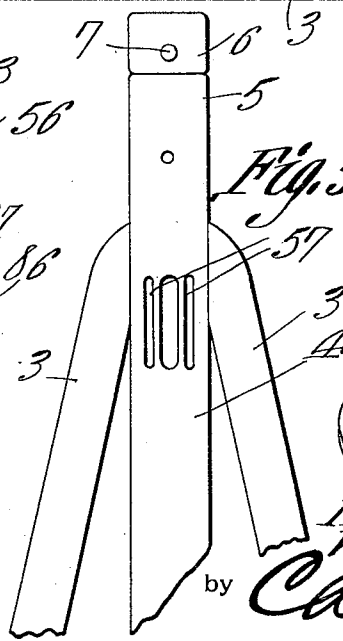
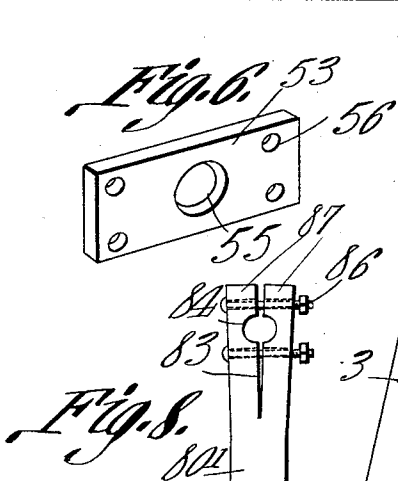
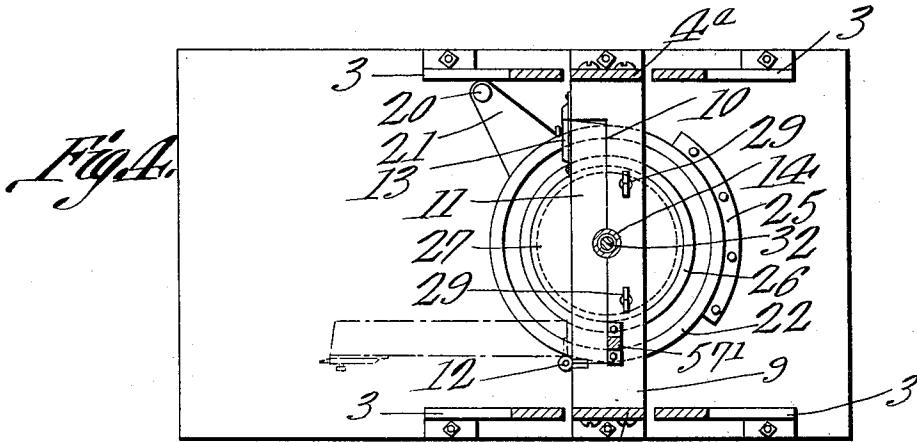
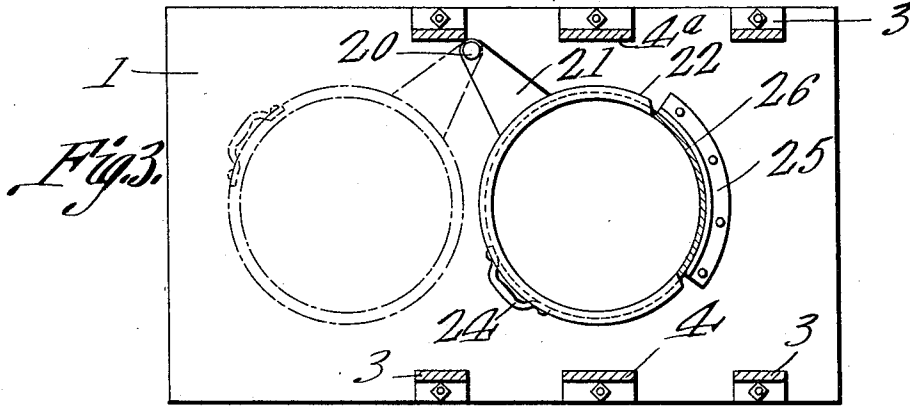
H. L. EDWARDS & W. A. PERKINS.
CHURN.

APPLICATION FILED MAY 15, 1911.

Patented Oct. 10, 1911.

2 SHEETS—SHEET 2.

1,005,421.



Witnesses
J. R. Gorman
L. H. Wilson.

H. L. Edwards and W. A. Perkins, Inventors
by *C. A. Knowlton*
Attorneys

UNITED STATES PATENT OFFICE.

HENRY L. EDWARDS AND WILLIAM A. PERKINS, OF GAINESVILLE, TEXAS.

CHURN.

1,005,421.

Specification of Letters Patent.

Patented Oct. 10, 1911.

Application filed May 15, 1911. Serial No. 627,274.

To all whom it may concern:

Be it known that we, HENRY L. EDWARDS and WILLIAM A. PERKINS, citizens of the United States, residing at Gainesville, in the county of Cooke, State of Texas, have invented a new and useful Churn, of which the following is a specification.

This invention relates to churns, and more especially to those employing a reciprocating dasher; and the object of the same is to effect improvements in all parts of the churn and its operating mechanism. This object we accomplish by the construction hereinafter more fully described and claimed and as shown in the drawings wherein—

Figure 1 is a central vertical sectional view of this device on the line 1—1 of Fig. 2. Fig. 2 is a side elevation of this device viewing Fig. 1 from the right. Figs. 3 and 4 are horizontal sections on the lines 3—3 and 4—4 respectively of Fig. 2. Fig. 5 is a detail in elevation showing the lower end of one leg of the yoke, and Fig. 6 is a perspective detail of one of the adjustable bearings. Fig. 7 is a perspective detail of the milk break, with its parts slightly separated. Fig. 8 is an enlarged detail showing the fork at the upper end of the pitman. Fig. 9 is a perspective detail of the socket bearing and the slotted bracket on which it is supported.

In the drawings the numeral 1 designates a flat base, preferably made of wood and of some considerable size, and bolted thereto are the feet of legs 3 which converge upward and join the sides 4 of a yoke 5 which rises to a considerable distance above the base and the top 6 of which is rendered detachable from its sides 4 by means of bolts 7. Secured across this yoke about midway of its height and connected with it is a cross beam 9 which may well be of wood and is recessed in one edge as shown at 10 in Fig. 4, and within this recess is mounted a gate 11 which is hinged at one end to the cross beam as at 12 and detachably connected at its other end therewith as by a latch 13, the beam and the gate having semi-circular meeting notches 14 at their centers for a purpose to appear below. The structure thus far set up constitutes a frame work for supporting both the churn body and the driving mechanism therefor, the former being disposed mostly beneath the cross beam and the latter above it as will appear.

We might say here that the proportions

and materials of the parts are not essential to the successful operation of this machine, but we prefer to make the base of wood and possibly also the cross beam and gate, the churn body of earthenware with a cover of the same or of wood, the jacket or pan on the carriage perhaps also of earthenware, and all other parts of metal save possibly the crank handle and the pitman rod. Furthermore, while we have particularly described many of the details of construction, we desire not to be limited thereto further than as necessary by the terms of the claims which conclude this specification.

The carriage for supporting the churn body is pivoted at 20 upon the base 1 at one side thereof, near the seat of the yoke at that side, and at a point about midway between the positions which the churn bottom will occupy when in use and when not in use as will be seen in Fig. 3. The pivot 20 is at the outer end of an arm 21 which leads to the carriage proper as seen in Fig. 3, and in Fig. 1 we have shown that this carriage comprises in the present instance a pan 22 adapted to contain hot or cold water to serve as a jacket for the churn body, and the carriage is supported upon rollers 23 so that it may be moved easily over the base by means of a handle 24. When in position beneath the driving mechanism it rests against a guard 25 as seen in Fig. 3, and at other times it is drawn outward by the handle to the position illustrated in dotted lines in that view and ready access can be had to the churn body. We prefer to make the pan 22 relatively shallow with respect to the churn body 26 (which latter as above stated is preferably a jar of earthenware), and when in place said body rests within the pan as there shown. The cover 27 has around its edge shoulders 28 engaging similar shoulders around the mouth of the body 26 so as to prevent the splashing out or escape of the contents; and when the body and its cover are in place they stand beneath and are held assembled by means of screws 29 which pass downward through the cross beam 9 and which when tightened up bind the carriage 22 firmly upon the base and renders it immovable thereover by accident or design until the screws are first loosened up.

The dasher for this churn is made into members 30 and 31, the former rigidly secured to the lower end of the dasher rod 32

which, as seen in Fig. 1, is provided with a series of perforations 33, and the other dasher 31 is adjustable vertically thereon by means of any suitable fastener which may extend through its hub and engage one of its perforations. Therefore we gain an advantage which should be explained, whatever the specific construction of the dashers themselves. When the rod 32 is reciprocated vertically by mechanism to be described, it is clear that the lower dasher 30 will rise and fall within the churn body 26, whatever the extent of the reciprocation, the same will be throughout the upper dasher 31, although if the driving mechanisms lift the rod too high this upper dasher cannot be set as high on the rod as the uppermost perforation illustrated in Fig. 1. If the two dashers are pushed together, they obviously act as one and at each movement of the dasher rod up or down they agitate the cream 1. If the dashers are set apart, they have two actions on the cream at each movement of the dasher rods up or down, but the result of these two actions varies according to the distance they are set apart, the length of the stroke, and the rapidity thereof. Thus it is possible to set them so near together that they would act substantially as one or to have the degree of reciprocation so slight or the speed of movement so rapid that the same result would be obtained. Care must be taken, therefore, if we would secure the best result from the use of two dashers, to set them with respect to each other so as to gain the best of results when all these conditions are observed, but this is a matter for the user rather than the manufacturer.

The milk break which we preferably employ is an important feature of this device, and is illustrated in detail in Fig. 7. Numeral 40 designates a plate having a threaded central hole 41 and around it a series of perforations 42 through which pass screws 43 that extend upward into the cover 27 to hold the plate in place. The numeral 44 designates a short section of pipe which is screw-threaded at both extremities, and which when in place is held within the meeting notches 14 in the cross beam 9 and gate 11, the lower end being passed through the cover 27 and screwing into the hole 41 in the plate 40. The numeral 45 designates the funnel whose reduced lower end is internally threaded as at 46, and this screws upon the threaded upper end of the pipe 44 as best seen in Fig. 1. This milk break serves first as a guide to the dasher rod, than which it is somewhat larger so as to permit the free vertical reciprocation thereof. Its funnel of course serves to permit of the introduction of hot or cold water into the churn when necessary, and while churning, yet without removing the cover. Its length and its position is such that it prevents the escape of the milk through the cover, and yet when the butter has "come" particles will adhere to the dasher rod 32 and be brought upward through the milk break into the funnel, where they will lodge and give notice that the churning operation has been completed. By preference we make this milk break of such length that the pivotal connection between the pitman (yet to be described) and the upper end of the dasher rod 32 will be in sight within the funnel when the dasher 30 at the lower end of said rod rests upon the bottom of the churn body 26. Our reason for this is because, when it is desired to cease churning and bring the churn body and carriage out from under the driving mechanism, it becomes desirable to disconnect the pitman from the dasher staff or rod and it is obviously necessary that the point where disconnection is to occur shall yet be within reach; yet we would not like to have the dasher rod long because that would make the pitman unduly short and cause unnecessary wobbling of the dasher rod. Therefore we preferably adopt the proportions of parts illustrated in Fig. 1 so that all ends desired may be achieved as easily as possible.

The churn driving mechanism includes the power generator and the means for connecting it with the dasher rod. In the present instance we have shown means for driving this churn by hand power, though it would not be impossible to connect up the power gear with a suitable motor and remove the crank handle yet to be described. As shown herein, the power gear 50 has a set screw 51 through its hub whereby it is detachably mounted upon a shaft 52 which latter extends through four adjustable bearing plates 53 (see Fig. 6) and is held removably in place by cotter pins 54, or other detachable fastening. Each plate has a bearing 55 at its center and perforations 56 near its extremities, these openings being properly disposed so as to match upright slots 57 in the sides 4 of the yoke as seen in Fig. 5. Two of these bearing plates 53 inclose one side 4 of the yoke between its legs 3, and two others inclose an upright brace 57' which stands adjacent this side of the yoke as best seen in Fig. 1, and all plates are connected in pairs by bolts 58 passing through the outermost of the slots 57. It will be obvious that we have thus provided means for vertically adjusting the two pairs of plates 53 so as to raise or lower the shaft 52 and its bearings for a purpose to be described below. Bolted to one of the spokes of the power gear 50 as at 60 is a crank 61 preferably slightly deflected outward in its body as seen in Fig. 1, and 62 is a handle at the outer end of this crank whereby the power gear 50 may be rotated manually when de-

sired. The bolts 60 extend through a slot 63 in the crank 61 whereby the latter may be set farther inward toward the axis or outward therefrom to increase the lever power, the purpose obviously being to give greater power and less speed when desired, or the reverse.

The connection between the power and the dasher rod includes a driven pinion 70 through whose hub passes a set screw 71 whereby it is detachably mounted upon a crank shaft 72 which is journaled in a bearing 73 in the sides 4 of the yoke and held detachably therein by means of a cotter pin 74. As the power shaft has been described as vertically adjustable, it is not necessary to adjust this driven or crank shaft 72, and therefore it is extended through a bearing 75 formed within the brace 57, and through another bearing 76 at the lower end of a hanger 77, which, like the brace 57, is bolted at 78 beneath the removable top portion 6 of the yoke, and adjacent said bearing 76 the crank shaft preferably carries a fly wheel 79. The inner extremity of this shaft is by preference mounted in a pocket bearing 80 (best seen in Fig. 9) which in turn is adjustably supported within the stop 81 of a bracket 82 that is carried by the left hand side 4^a of the yoke, and we find that this pocket bearing is valuable to prevent any vibration of the extremity of the crank shaft, even though the latter is supported by two bearings 75 and 76 at opposite sides of the fly wheel and its crank, and by yet another bearing 74 adjacent its driven pinion 70. The two intermediate bearings 75 and 76, being connected with the yoke 6, are removable therefrom when the top is detached by removing its bolts 7, and therefore the crank shaft can thus be taken away with the removable top of the yoke. When this is to occur, the pocket bearing 80 must be slipped backward within its slot 81 to free the left end of the shaft, and the driven pinion 70 must be removed by loosening its set screw 71 so that the right end of the crank shaft can be pulled out of the bearing 74. It will now be observed that the vertical adjustment of the power shaft is for several purposes. First it permits the adjustment of power gear 52 with respect to the pinion 70 when the supports of both become more or less worn. Second it permits this adjustment when the gear has to be replaced as by the old one having become broken. Third and finally it permits the substitution of a larger or smaller driven pinion 70 for that shown, when it is desired to change the power and the speed, and in the same way it would permit the substitution of an entirely new crank shaft and its pinion, as when it is desired to change the length of the crank itself and hence the length of the vertical stroke of the dashers

within the churn body. It will therefore be seen that the vertical adjustment of the power shaft and the removability of the crank shaft and of both pinions, coact with two dashers upon the dasher rod 32. If said dashers are set far apart the throw of the crank must be rather small, but the rapidity of its reciprocations could be increased and hence the size of the driven pinion 70 could be decreased. On the other hand, if said dashers are set closer together, conditions would be reversed; and between these two extremes the user will be governed by other conditions not necessary to elaborate here.

The pitman best seen in Fig. 8 may be of well seasoned wood, having a straight body 80' forked at its lower end as at 81, and detachably connected with the upper end of the dasher rod 32 by means of a cross pin 82 as seen in Fig. 1. Its upper end is by preference split as at 83 and the arms of the splits are notched as at 84 so as to complement each other and produce a bearing for the crank 85 of the crank shaft. Finally we pass bolts 86 across the split 83 and through the two arms 87, above and below said bearings 84 so as to hold the parts thereof properly upon the crank 85 and to prevent this split from extending farther into the body 80 of the pitman in case it should be of wood. Thus it will be seen that the upper or crank end of this pitman is detachable from the crank 85, although we rarely detach it here except when a new crank shaft is to be inserted. The lower end thereof is readily detachable from the upper end of the dasher rod 32, by simply withdrawing the pin 82; and as above stated we prefer that the length of the pitman and length of the rod shall be such that this pin will be visible within the funnel 45 of the milk break, even when the lower dasher 30 rests upon the bottom of the churn body 26.

All parts being set up as best seen in Fig. 1, the operator grasps the handle 62 and rotates the power gear 50. Ordinarily this will be about seven times the circumference of the driven pinion 70, and the latter will therefore be rotated seven times to one revolution of the power gear. The crank shaft 72 rotates within its bearing causes the crank 85 to move the pitman rapidly, and the pin 82 communicates said movements to the dasher rod 32 and it is therefore reciprocated vertically within the churn bottom 26. This moves the two dashers 30 and 31 up and down therein, and churning is rapidly effected. When the butter has "come" as indicated by particles thereof which appear within the funnel 45, the rotation of the power wheel is stopped, the pin 82 is removed, the screws 29 are run up, the gate 11 unlatched at 13 and thrown open as shown in dotted lines in Fig. 4, and

the operator grasps the carriage 22 by its handle 24 and swings it to the position shown in dotted lines in Fig. 3. This gives easy access to its interior by simply removing the cover 27 which is then well out from under the cross beam 9 and the gate that has been swung aside. The churn body 26 can be lifted out of the pan 22, because in removing the cover the dasher rod 32 and both dashers have been taken out with it; or if preferred the cover and with it the milk break may be lifted off of the dasher rod, and the latter allowed to remain within the churn body and the butter therein. As these working parts of the churn are removable entirely from the driving mechanism, it will be obvious that their cleansing is rendered easy. When churning is continued or resumed this operation is reversed, and the latching of the gate in a closed position and coupling of the dasher rod to the piston connects the churn proper with the driving mechanism proper.

Throughout this specification we have given the purposes of various details of construction, as the description occurs, and it will therefore not be necessary to reiterate at this time. We would, however, call attention to Figs. 3 and 4 wherein it is shown that the base 1 is rather longer than it is wide and the yoke is mounted over one end of it so that the center of the churn body when in use is nearly coincident with the center of one half of the base, and when not in use is moved out onto or over the other half thereof and hence away from the cross beam 9. Moreover, the arm 21 stands oblique across the base in either position of the churn body, and when the latter is beneath the beam it rests against the guard 25 and is held firmly in position by the gate 11 which is latched against the milk break, the latter projecting rigidly from the cover and being held there by the screws 29. Hence no further means is necessary to hold the churn body in place on the base, although it is sustained above the same merely by the ball bearing rollers 23, and these of course permit the operator to swing the churn with its contents evenly over the base whether putting it into working position or moving it out of the same.

What is claimed is:—

1. In a churn, the combination with a base, of a yoke whose sides and feet secure it to the sides of the base near one end thereof, a cross beam connecting the sides of the yoke and recessed between its extremities, a gate filling said recess and hinged at one end to the beam, a latch at its other end detachably connecting it with said beam, the adjacent faces of the beam and gate being notched, churn-driving mechanism carried by the upper portion of the yoke; a carriage mounted on rollers upon said base, an arm

leading radially from the carriage and pivoted to the base, a churn body removably mounted upon said carriage, the dasher and dasher-rod therein, the cover through which said rod passes, and a pipe rising from the cover around the rod and adapted to be clamped within the registering notches in the beam and gate.

2. In a churn, the combination with a base, of a yoke whose sides and feet secure it to the sides of the base near one end thereof, a cross beam connecting the sides of the yoke and recessed between its extremities, a gate filling said recess and hinged at one end to the beam, a latch at its other end detachably connecting it with said beam, the adjacent faces of the beam and gate being notched, churn-driving mechanism carried by the upper portion of the yoke; a carriage movable longitudinally over said base, a pan on the carriage, a body mounted in said pan, a cover therefor having a central hole, a pipe section rising from said hole around the dasher rod and adapted to be detachably clamped within said registering notches, and screws extended downward through the cross beam and carrying said cover into engagement with the mouth of the body.

3. In a churn, the combination with an upright body, a removable cover therefor having a central hole, an upright dasher rod passing through said hole, a lower dasher fixed to the lower extremity of said rod, an upper dasher, and means for adjustably mounting the upper dasher at various points upon said rod; of driving mechanism for reciprocating said rod vertically, means for changing the extent of reciprocation and the speed thereof, and a milk break comprising a tubular body rising from the hole in the cover and having a funnel at its upper end surrounding said rod and so disposed that the coupling between said rod and the driving mechanism shall stand exposed within the funnel when the lower dasher rests on the bottom of the body.

4. In a churn, the combination with an upright body, a removable cover therefor having a hole through its center, a dasher and dasher rod, means for reciprocating the latter vertically; of a milk break comprising a plate having a hole at its center, means for securing said plate to the under side of the cover with the hole registering with that of the cover, a pipe having its lower end passing through the cover and engaging in the hole in said plate, and a funnel whose smaller end is removably engaged with the upper end of said pipe.

5. In a churn, the combination with the churn body, the dasher and dasher rod; of a pitman connected with said rod, a crank shaft with whose crank the other end of the pitman is detachably connected, a yoke having a removable top, a power gear whose

shaft is journaled in said yoke, a pinion on the crank shaft engaged by said gear, bearings for the shaft carried by the removable portion of the yoke, a bracket in one side of the yoke, and a pocket-bearing removably mounted on said bracket and engaging that extremity of the crank shaft which is opposite from the driven pinion.

6. In a churn, the combination with the body, the dasher and dasher rod, and a pitman connected with said rod, the upper end of the pitman being forked and the arms of the forks having registering notches, and bolts for drawing said arms together; of a crank shaft whose crank is removably engaged by said registering notches, means for rotating the shaft from one extremity thereof, an upright yoke, a removable top portion therefor, bearings for said shaft carried by said removable top portion, at either side of the crank, a fly wheel on the shaft adjacent the crank, and a pocket-bearing for that end of the shaft which is remote from its driven pinion.

7. In a churn, the combination with a base, a yoke whose sides rise therefrom, one of which sides has a plurality of upright slots, a cross beam within the yoke, a churn body beneath said beam, a dasher and dasher rod within said body, and guides for said rod carried by the beam, a brace connecting said beam with the top of the yoke and standing adjacent the slotted side thereof, the brace having slots registering with those in said side, plates arranged in pairs upon the brace and upon the slotted side, each plate having a central bearing and perforations at opposite sides thereof, securing members passing through the perforations and side slots, a shaft passing through said central bear-

ings, a gear train connected with the extremity of the shaft, a driven pinion intermeshing therewith, a crank shaft on which said pinion is fast, and a pitman connecting the crank of this shaft with the dasher rod.

8. In a churn-driving mechanism, the combination with a churn, a crank shaft connected with its dasher, a yoke carrying bearings for said shaft, a driven pinion mounted on the extremity of said shaft, and a set screw through its hub detachably securing it thereon; of a power gear in mesh with said pinion, a shaft therefor, a set screw through its hub engaging said shaft, bearings for said shaft, and means for adjusting said bearings within the yoke toward or from the counter shaft.

9. In a churn-driving mechanism, the combination with a churn, a crank shaft connected with its dasher, a yoke carrying bearings for said shaft, a driven pinion mounted on the extremity of said shaft, and a set screw through its hub detachably securing it thereon; of a power gear in mesh with said pinion, a shaft therefor, a set screw through its hub engaging said shaft, bearings for said shaft, means for adjusting said bearings within the yoke toward or from the counter-shaft, a slotted crank handle, and bolts through the slots thereof and into one of the spokes of said wheel.

In testimony that we claim the foregoing as our own, we have hereto affixed our signatures in the presence of two witnesses.

HENRY L. EDWARDS.

WILLIAM A. PERKINS.

Witnesses:

LOUIS BRINGMEN,

W. O. DAVIS.