H. M. CROCKER.

INTERMITTENT DRIVING MECHANISM.

APPLICATION FILED OCT. 20, 1913.

1,167,337.

Patented Jan. 4, 1916.

2 SHEETS—SHEET 1.

Fig. 1

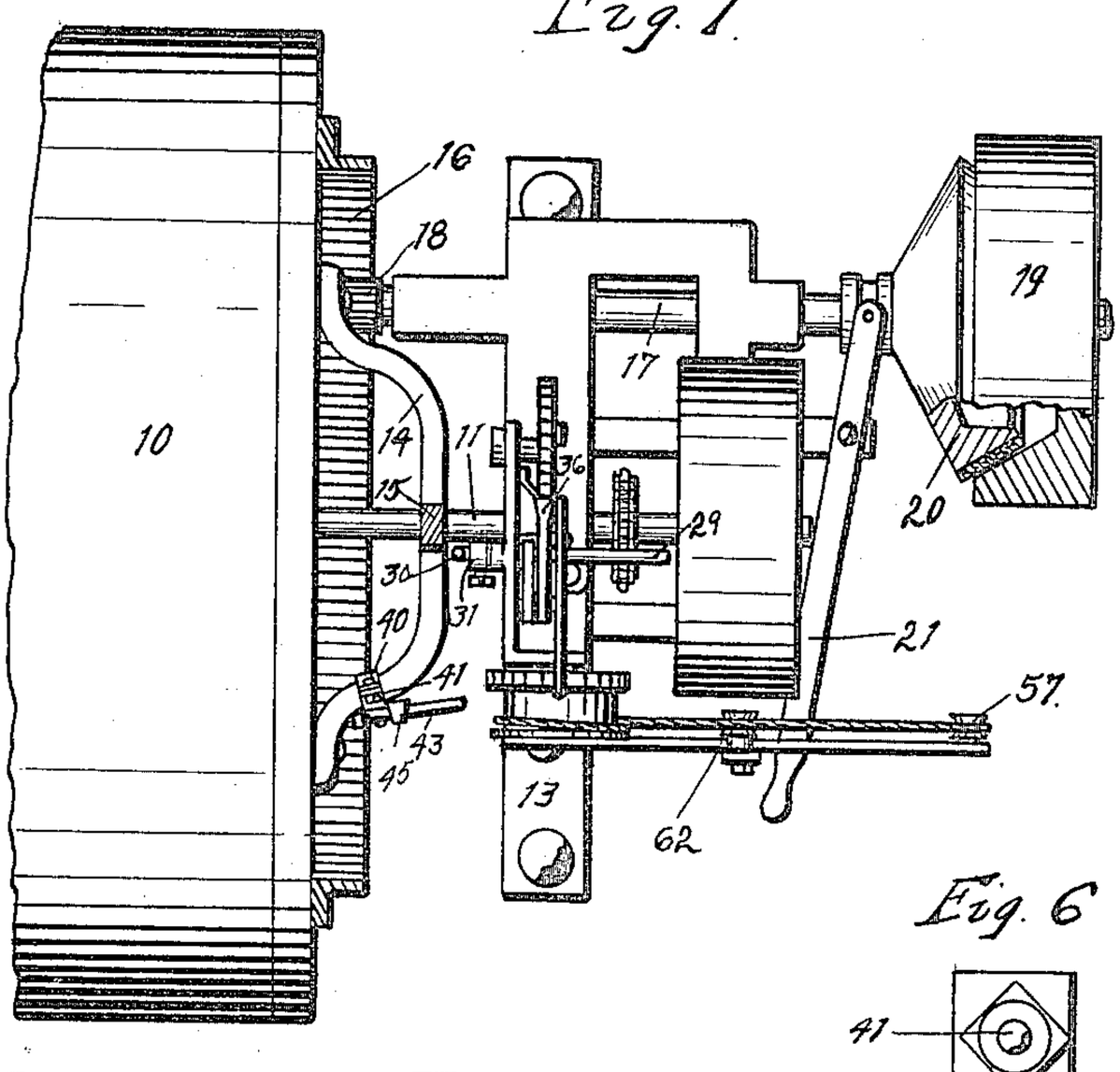


Fig. 8.

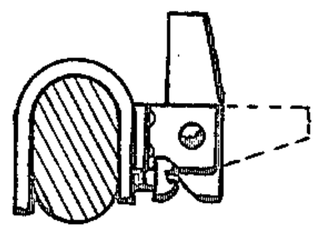


Fig. 6

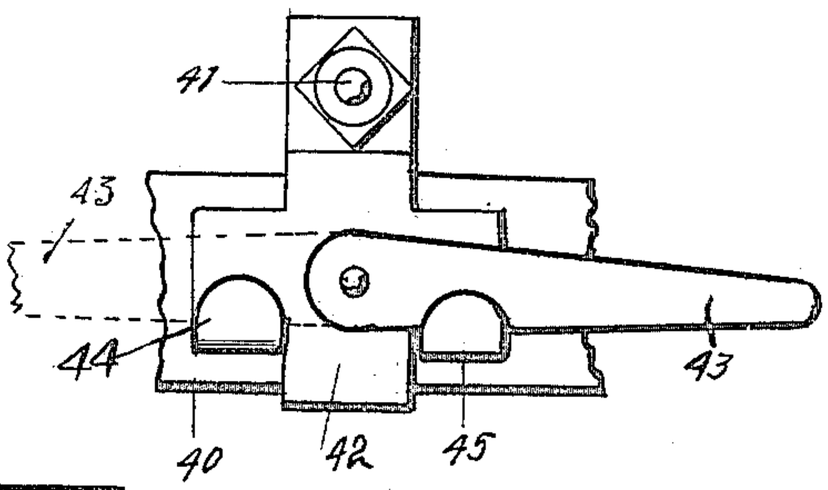
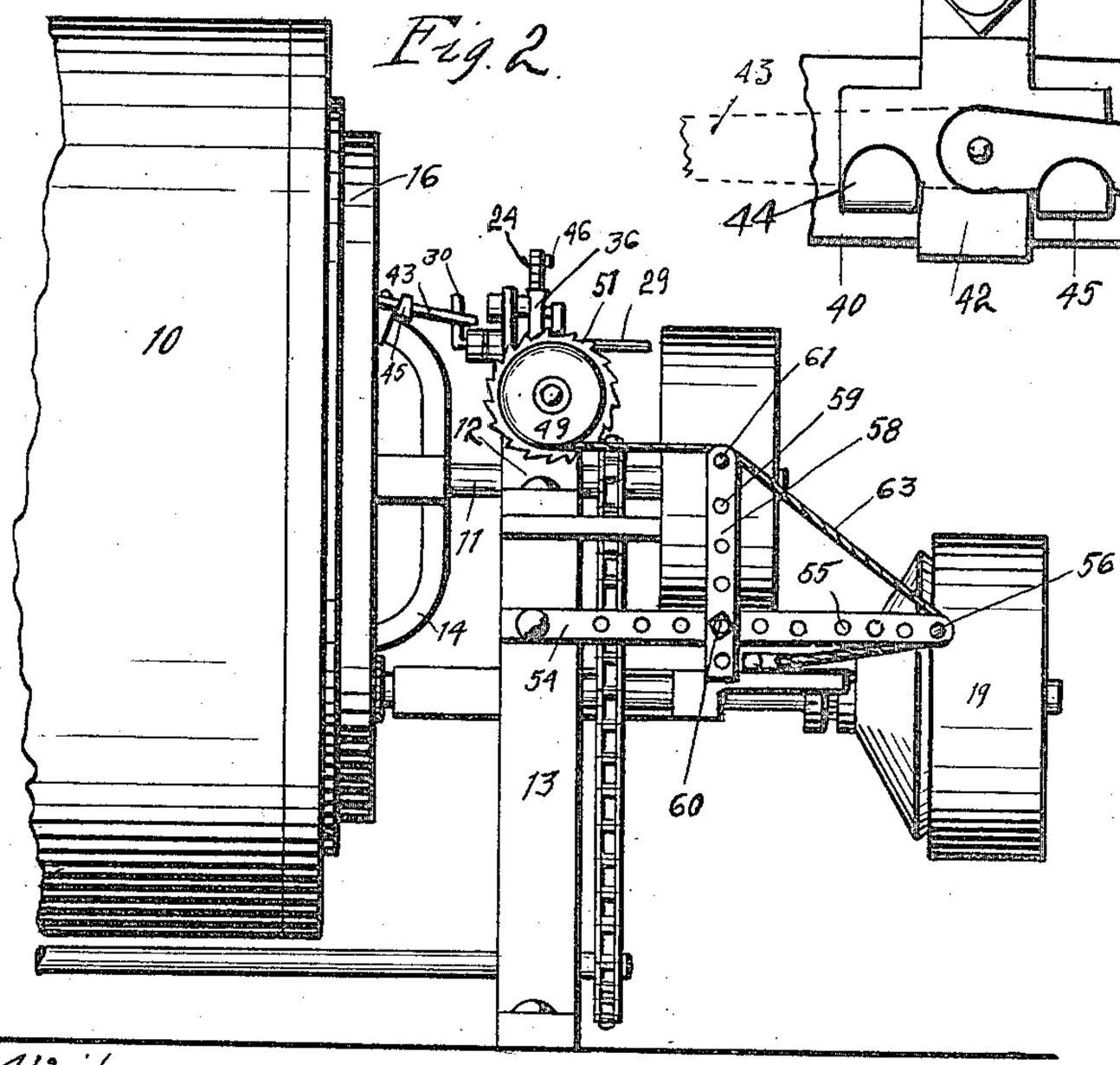


Fig. 2.



Witnesses.

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2 SHEETS—SHEET 2.

Fig. 3.

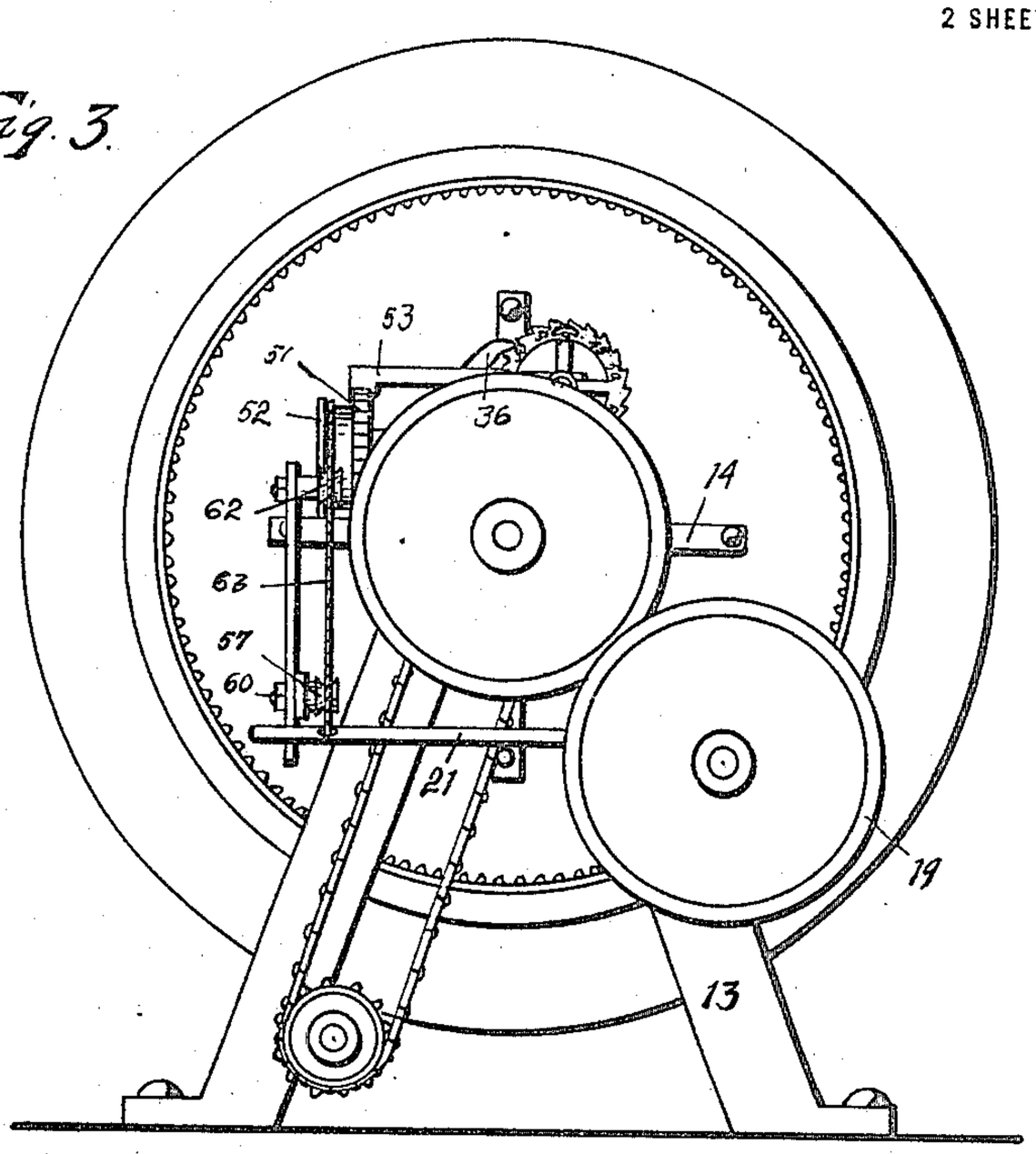


Fig. 7.

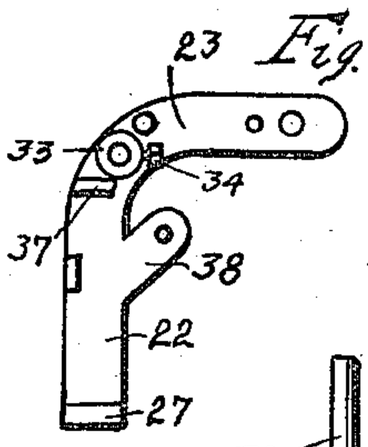


Fig 5.

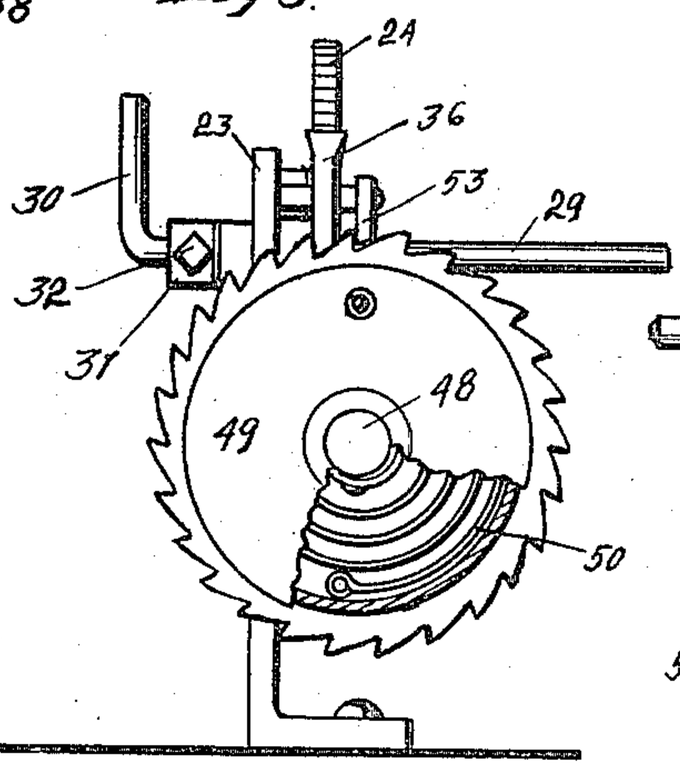
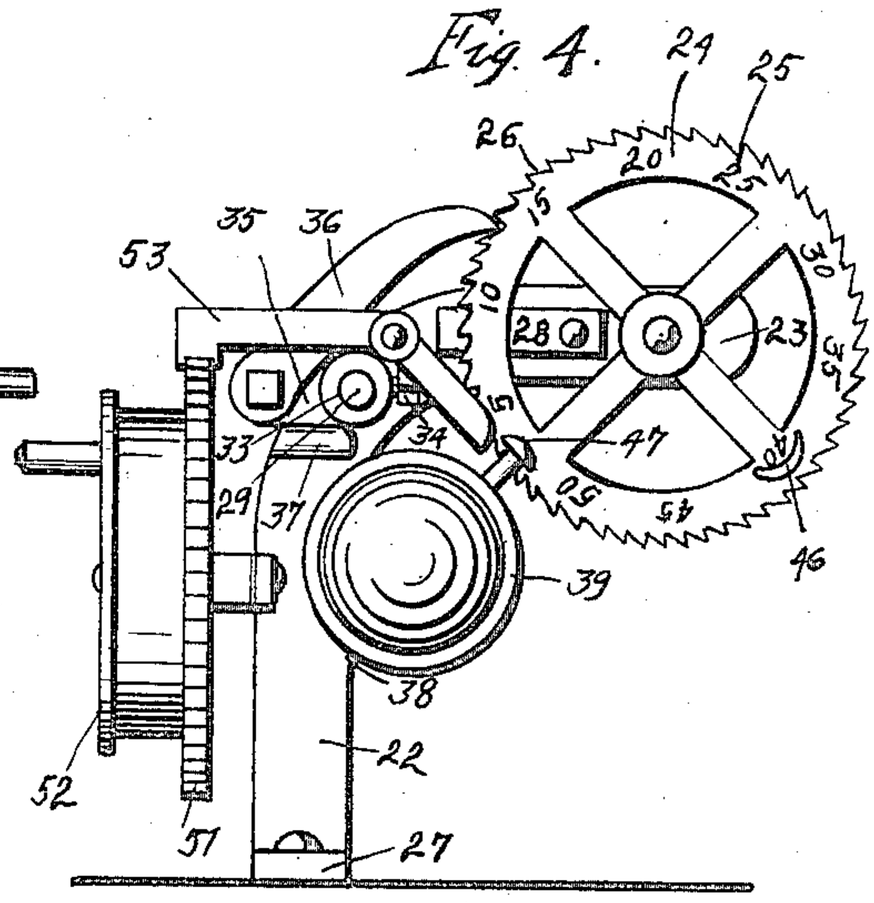


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

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INTERMITTENT DRIVING MECHANISM.

1,167,337. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed October 20, 1913. Serial No. 796,360.

To all whom it may concern:

Be it known that I, HOWARD M. CROCKER, a citizen of the United States, and resident of Nora Springs, in the county of Floyd and State of Iowa, have invented a new and useful Intermittent Driving Mechanism, of which the following is a specification.

The object of my invention is to provide an intermittent driving mechanism for a timer attachment for a combined churn and butter worker or the like of simple, durable and inexpensive construction.

More particularly, it is my object to provide such a device adapted to be used with a timer attachment for a churn and butter worker, having parts so constructed and arranged that my improved timer may be quickly and easily attached to and used with any of the standard makes of machines of this kind.

Still a further object is to provide such a timer attachment, having parts so arranged that the length of the stroke imparted to the timing mechanism at each revolution of the churn or the like may be varied or regulated, as desired.

Still a further object is to provide, in connection with such a timer attachment, simple and inexpensive mechanism whereby, after a churn has made a certain predetermined number of revolutions, an audible alarm will be sounded.

My invention consists in the construction, combination and arrangement of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying drawings, in which:

Figure 1 shows a top or plan view of one end of a combined churn and butter working machine equipped with a timer having an intermittent driving mechanism embodying my invention. Fig. 2 shows a side elevation of the same. Fig. 3 shows an end elevation of the same. Fig. 4 shows a detail view of my improved timer. Fig. 5 shows a similar view taken at right angles to the view shown in Fig. 4. Fig. 6 shows a detail view of part of the device designed to be secured to the drum of the churn to strike or engage the timer. Fig. 7 shows a side elevation of the bracket for supporting the timing mechanism, and Fig. 8 shows a detail view of another form of engaging finger.

In the accompanying drawings I have used the reference numeral 10 to indicate generally a large drum or churn of the type which is mounted upon a shaft 11 mounted in bearings 12 on suitable supports 13. The churn shown is of the type having spider arms 14 connected with a barrel of the churn and with bearings 15 on the shaft 11. The upper part of the bearing 12 is sometimes called a pillow block cover. The type of churn shown in the drawings is one having on one end of the barrel an internal gear 16. The shaft 17 is suitably mounted and on one end thereof is a gear 18 in mesh with the gear 16. On one end of the shaft 17 is a loosely mounted pulley 19 which may be thrown into or out of gear with shaft 17 by means of a friction clutch 20 controlled by the horizontally swinging lever 21.

My improved timer comprises a substantially vertical bracket portion 22, the upper end of which curves away to form a substantially horizontal portion 23. Rotatably mounted on the portion 23 is a toothed wheel 24 on which are indicating numerals 25. The largest indicating numeral corresponds to the number of teeth 26 in the periphery of the wheel 24. At the lower end of the bracket 22 is a laterally extending flange or base 27, adapted to be secured to the bearings or pillow block covers of any ordinary combined churn and butter working machine.

Secured to the arm or portion 23 and frictionally engaging the wheel 24 is a spring 28 which tends to frictionally hold the wheel 24 in any position of its rotary movement. Extended through the bracket 22, at right angles thereto, is a shaft or rod 29. At one end of the rod 29 is a right angled extension 30. Mounted on the rod 29 on one side of the bracket 22, is a collar 31 in which is a set screw 32 for locking the collar on the rod. On the other side of the bracket 22 a collar 33 is mounted on the rod 29 and may be secured in any position of its movement by means of a set screw 34. Formed on the collar 33 is an arm 35 to which is pivoted a pawl 36. On the bracket 22 is formed a lug 37, preferably slightly below the level of

the shaft 29 and designed to limit the movement of the arm 35 and to prevent the downward movement of said arm below substantially horizontal position.

It will be seen that if the pawl 36 is turned upwardly and toward the wheel 24, then if the shaft 29 is rotated for a short distance in a direction to move the arm 35 away from the lug 37, then when the motive power on the shaft 29 is released, the pawl 36 will by gravity drop back, carrying the arm 35 downwardly until it is engaged by the lug 37. Formed on the bracket 22 is a short arm 38 which carries a bell 39.

Practically all of the combined churns and butter workers now in general use in the United States have some portion or element which corresponds generally in construction to the spider arm 14.

For striking the extension 30 once with each revolution of the churn and causing the pawl 36 to advance the wheel 24 one notch, I have provided the following device which is designed to be mounted on one of the spider arms 14: A flexible metal band 40 is designed to be secured to the spider arm 14 by means of a bolt 41. Secured to the band 40 is a plate 42 to which is pivoted a finger 43. Formed on the plate 42 is an extension 43, the ends of which are bent over to form devices 44 and 45 for limiting the pivotal movement of the lever 43.

In the practical operation of the part of my improved timer hereinbefore described, the bracket 22 is mounted on the pillow block cover and the plate or strip 40 is secured to the spider arm in proper position for causing the finger 43, when it is received in the limiting device 45, to strike the extension 30 once during each revolution of the churn and butter worker.

It will be seen that if the spider arms 14 project a greater or less distance from the body of the frame 10, the shaft or rod 29 may be adjusted longitudinally in order to bring the extension 30 directly within the path of the finger 43. This adjustment may be so accurate that when the finger 43 is moved to position where it is engaged by the device 44 it will not strike the extension 30 during the revolution of the churn. It will be seen that if the spider arms 14 are comparatively short or if, for any reason, the strip or band 40 is secured to said spider arms comparatively close in to the shaft 11 and the parts are arranged so that the finger 43 strikes the extension 30 near the body of the rod 29, suitable movement will be imparted to the rod 29. The movement which is so imparted to said rod will be regulated or, in other words, the length of the stroke of the pawl 36 may be regulated by turning the rod 29 in the bracket 22 so that the finger 43 only turns the rod 29 a short distance.

On the wheel 24 is a beveled lug 46 which as the wheel rotates is designed to strike a plunger 47 of the bell. The notches 26, the indicating characters 25, the lug 46, the pawl 36 and the bell 39 are so proportioned, located and constructed that when the machine is set with the pawl received in any certain notch, as, for instance, the notch 10, then when the wheel is moved a number of notches corresponding to the one at which the pawl is set, the plunger 47 will be engaged by the lug 46 and the bell will be rung. The lug 46 is of sufficient length to depress the plunger 47 during a complete revolution of the churn 10.

My improved timer is provided with simple mechanism which will be readily and easily adjusted for operating the lever for throwing the machine out of gear after any desired number of revolutions. For that purpose I have mounted on the bracket 22 a shaft 48 on which is a drum 49. Fixed to the drum and to the shaft 48 within the drum, is a powerful coil spring 50. At one side the drum is provided with a toothed wheel 51 and at the other side with a circumferential annular flange 52. Pivoted to the bracket arm 23 is a lever 53, one end of which is designed to engage the toothed wheel 51, and the other end of which is extended into the path of the lug 46 and is designed to be engaged thereby immediately after said lug sounds the bell 39. For causing the spring 50 to operate through the lever 21 which controls the clutch, I have mounted upon the member 13 a bar 54 having a plurality of openings 55. Detachably mounted in one of the openings 55 is the shaft 56 of the grooved pulley 57. A second bar 58, provided with a plurality of holes 59, is designed to be secured to the bar 55 by a bolt 60 extended through one of the holes 59 and one of the holes 55. Selectively mounted in one of the openings 59 is a shaft 61 of the grooved pulley 62. Secured to and wound upon the drum 49 is a flexible device 63 which is extended over the pulleys 61 and 57 and is secured to the lever 21.

The parts hereinbefore described are so constructed and arranged that when the lever 53 is engaged by the lug 46, the spring 50 is released, the drum 49 is rotated to swing the flexible device 63 on said drum, and the lever 21 is moved in the proper direction for throwing the clutch member 20 out of gear.

It will readily be seen that by a comparatively slight adjustment of the parts 54 and 58, and the grooved pulleys hereinbefore described, those parts may be arranged to throw the lever controlling clutch regardless of its position in the machine.

It will be understood that variations may be made in the location of the parts and in the construction or arrangement of the part of my device and it is my intention to cover by

this application any such variations in location or construction which may be included within the scope of the appended claims.

The advantages of my improved device are numerous. The parts are of comparatively simple and durable construction and may be manufactured at a small cost.

It will be seen from the foregoing description that the parts may be made in standard sizes and the means for adjustment are such that one size of my improved timer may be used for practically all standard makes of churns and butter working machines. By adjusting the rod 29 longitudinally in the bracket 22, the position of the extension 30 with relation to the end of the churn 10 may be varied considerably so that said extension may be located in the path of the finger 43 even though there may be considerable variation in the form, size and structure of the spider arms 14. At the same time, by varying the position of the extension 30 from that in which it stands normally upright, I am able not only to adjust the machine for different locations of the finger 43 but am also able to regulate the stroke which is imparted through the pawl 36.

The construction of the holding devices 44 and 45 and the finger 43 and their connection with the plate 42 and band 40 are such that said finger is gripped by either of the holding devices 45 or 44 and when gripped by the device 45 will engage the extension 30 while when gripped by the device 44 will miss the extension 30. The arrangement of the toothed wheel 24 and the parts connected therewith, is such that the device may be set to give an alarm in any desired number of revolutions. The operator is therefore able to start the machine and to mix salt with the butter or to work the butter for moisture for any desired number of revolutions during which he does not need to pay any special attention to the churn and butter working machine. At the end of the desired number of revolutions, the bell is rung for a considerable period and furnishes sufficient audible alarm.

By slight adjustment of the parts, my improved timer may be attached to any ordinary type of churn in such a manner that after a predetermined number of revolutions, the churn may be thrown out of gear and automatically stopped. It should be understood that the plate for holding the finger 43 may be located on or secured to different parts on different machines. It may be noted also that by slight variations in construction, my timing and stopping mechanism could easily be adapted for use with a great variety of machines, such as churns, washing machines and the like.

I claim as my invention:

1. In a device of the class described, the combination of a frame, a rotary member, a bracket on the frame, a toothed wheel mounted on the bracket, a rod mounted to slide in said bracket, toward or from said rotary member, having an extension at one end, at an angle to the body thereof, means for fixing said rod in any position of its sliding movement, a pawl operatively mounted with relation to said rod to coact with said wheel and means on said rotary member for engaging said extension.

2. In a device of the class described, the combination of a frame, a rotary member thereon, a bracket on the frame, a toothed wheel mounted thereon, a rod mounted to slide in said bracket, toward or from said rotary member, having an extension at one end, at an angle to the body thereof, means for fixing said shaft in any position of its sliding movement, a pawl operatively mounted with relation to said rod to coact with said wheel, and means designed to be adjustably mounted on said rotary member, for intermittently engaging said extension.

3. In a device of the class described, a machine having a stationary, and a rotating part, a bracket on the stationary part, a ratchet wheel mounted on said bracket, a rod mounted to slide in said bracket having an extension at one end at an angle to the body of the rod, means for fixing said rod in any position of its sliding movement against longitudinal movement, an arm adjustably mounted on said rod, a pawl pivoted to said arm to coact with said ratchet wheel and means on said rotary part for engaging said extension.

4. In a device of the class described, a machine having a stationary and a rotating part, a bracket on the stationary part, a ratchet wheel mounted on said bracket, a rod mounted to slide in said bracket having an extension at one end at an angle to the body of the rod, means for fixing said rod in any position of its sliding movement against longitudinal movement, an arm adjustably mounted on said rod, a pawl pivoted to said arm to coact with said ratchet wheel, and adjustable means on said rotating part for engaging said extension once every revolution of said part for thereby operating said pawl for causing it to move said wheel a certain distance.

5. In a device of the class described, a bracket, a toothed wheel mounted thereon, a rod mounted to slide in said bracket, having an extension at one end, at an angle to the body thereof, means for fixing said rod in any position of its sliding movement, a pawl operatively mounted with relation to said rod to coact with said wheel, means for limiting the rotary movement of said rod away from the ratchet wheel, a rotary member and means thereon for engaging said extension.

6. In a device of the class described, a

frame, a rotary member thereon, a bracket on the frame, a ratchet wheel thereon, a rod slidably mounted in said bracket having an extension forming an angle with the body of said rod, a collar adjustably mounted on said rod, an arm on said collar, a pawl pivoted to said arm, to coact with said wheel, said bracket being formed with a lug for engaging said arm and limiting the movement thereof, and means adapted to be mounted on said rotary member for engaging said extension.

7. In a device of the class described, the combination of a frame, a rotary member, a bracket on the frame, a toothed wheel mounted on the bracket, a rod mounted to slide in said bracket, toward or from said rotary member, having an extension at one end, at an angle to the body thereof, means for fixing said rod in any position of its sliding movement, a pawl operatively mounted with relation to said rod to coact with said wheel and means on said rotary member for engaging said extension, and an alarm device actuated on said ratchet.

8. In a device of the class described, the combination of a frame, a rotary member, a bracket on the frame, a toothed wheel mounted on the bracket, a rod mounted to slide in said bracket, toward or from said rotary member, having an extension at one end, at an angle to the body thereof, means for fixing said rod in any position of its sliding movement, a pawl operatively mounted with relation to said rod to coact with said wheel, and means on said rotary member for engaging said extension, an alarm device, and means for operatively connecting the alarm device with the ratchet.

Des Moines, Iowa, October 4, 1913.

HOWARD M. CROCKER.

Witnesses:

W. S. MATHERS,

JAMES A. CUTLER.