

May 19, 1964

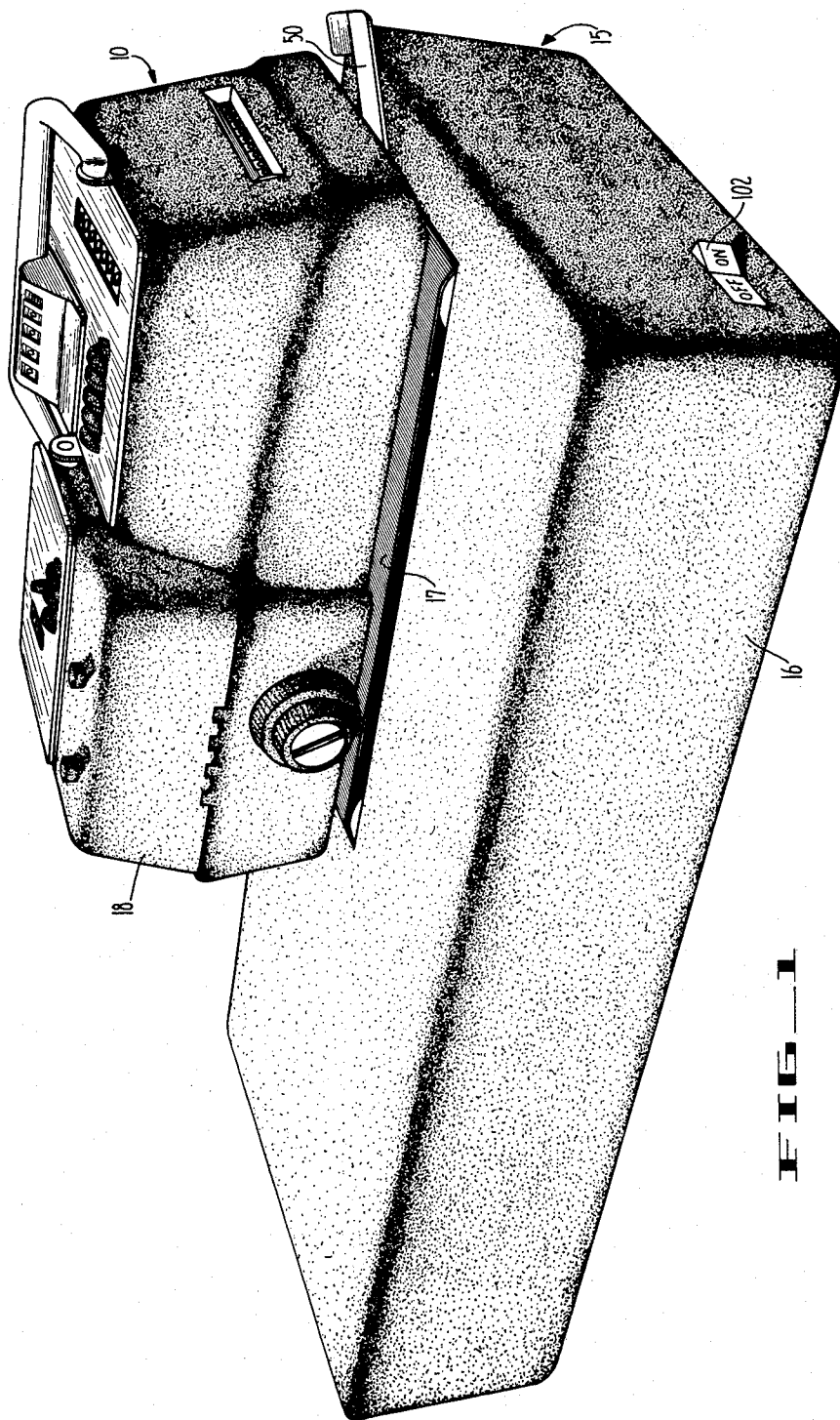
W. SCHAERER ETAL

3,133,700

POSTAGE METER

Filed April 3, 1962

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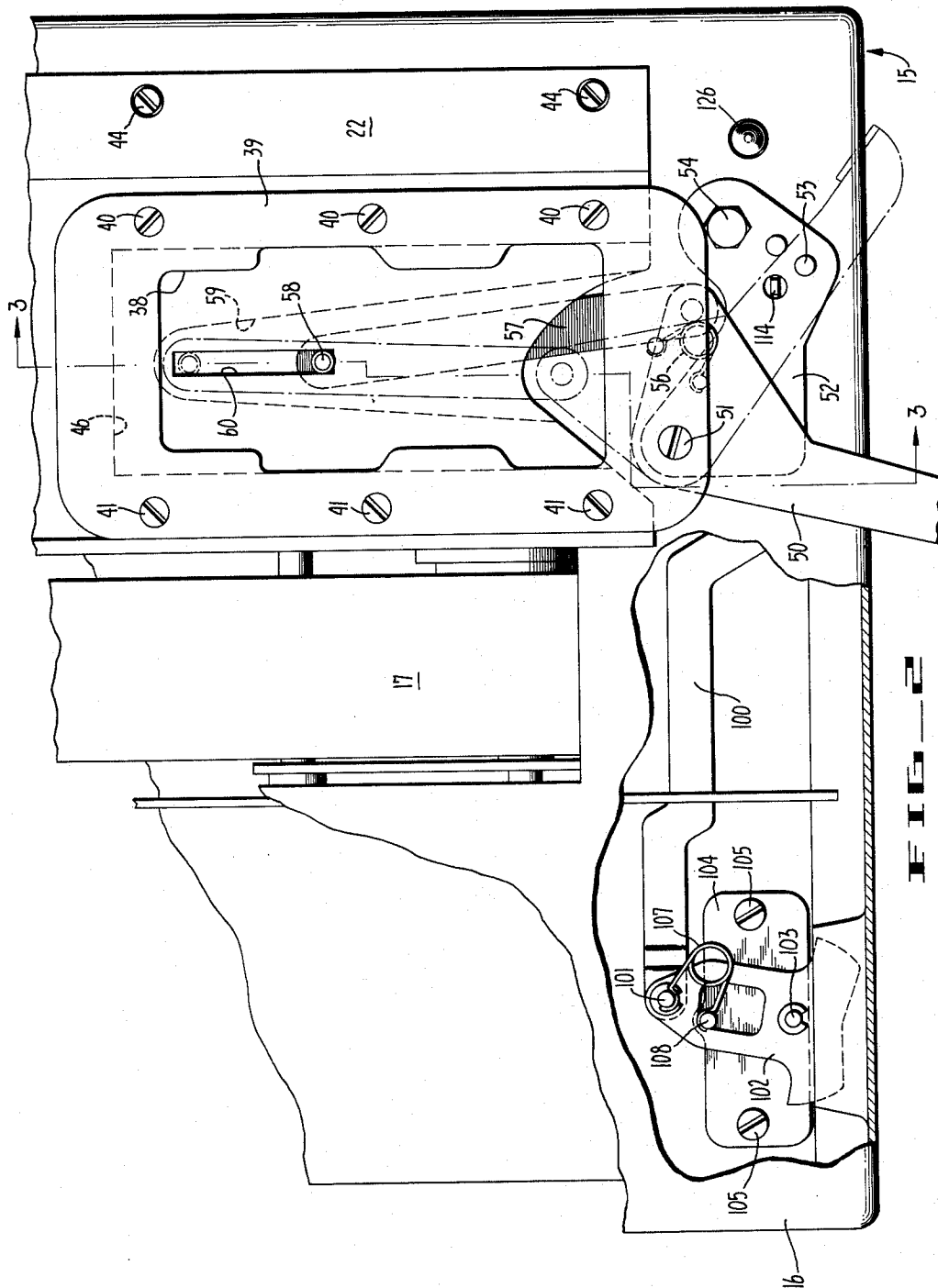
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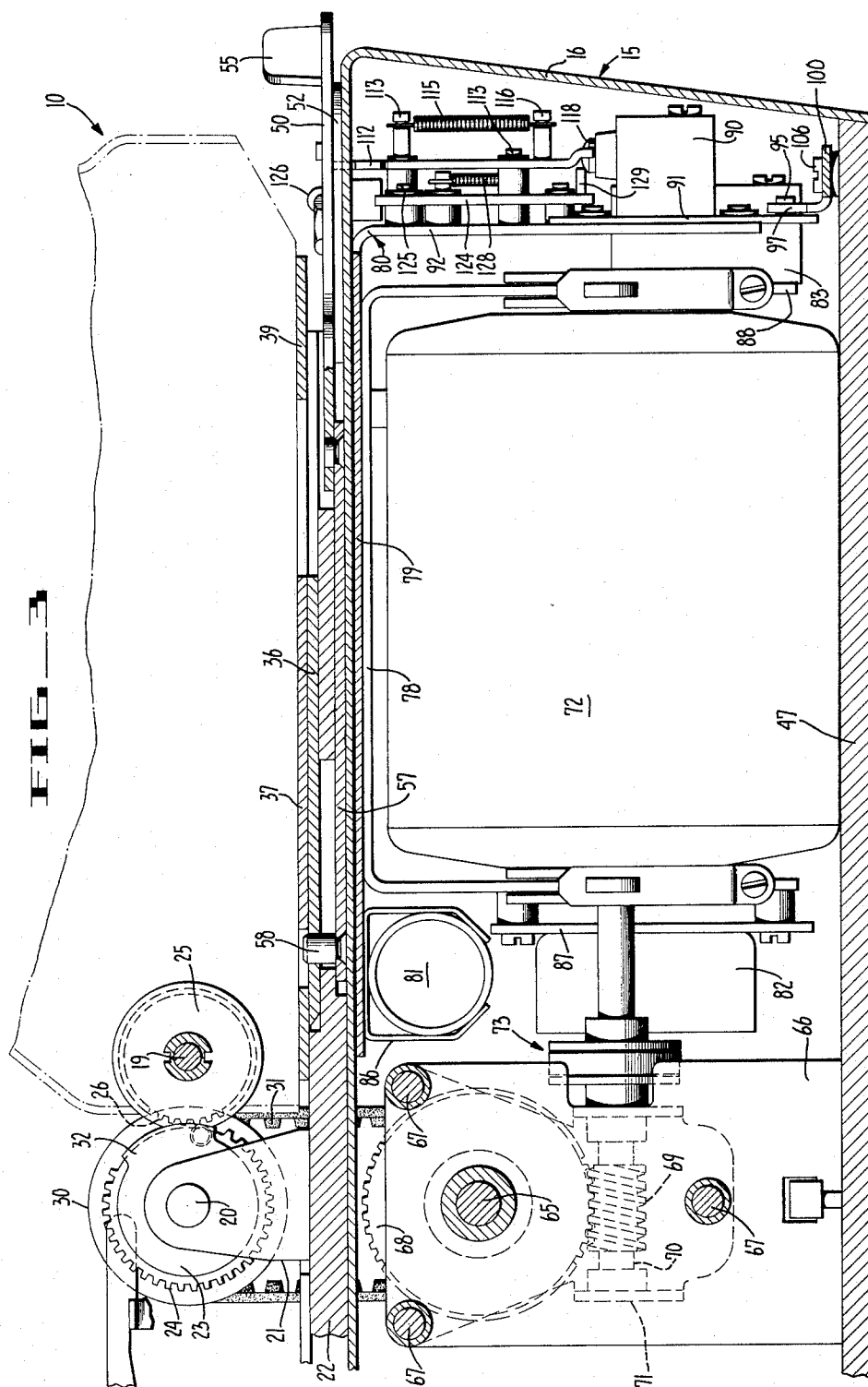
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POSTAGE METER

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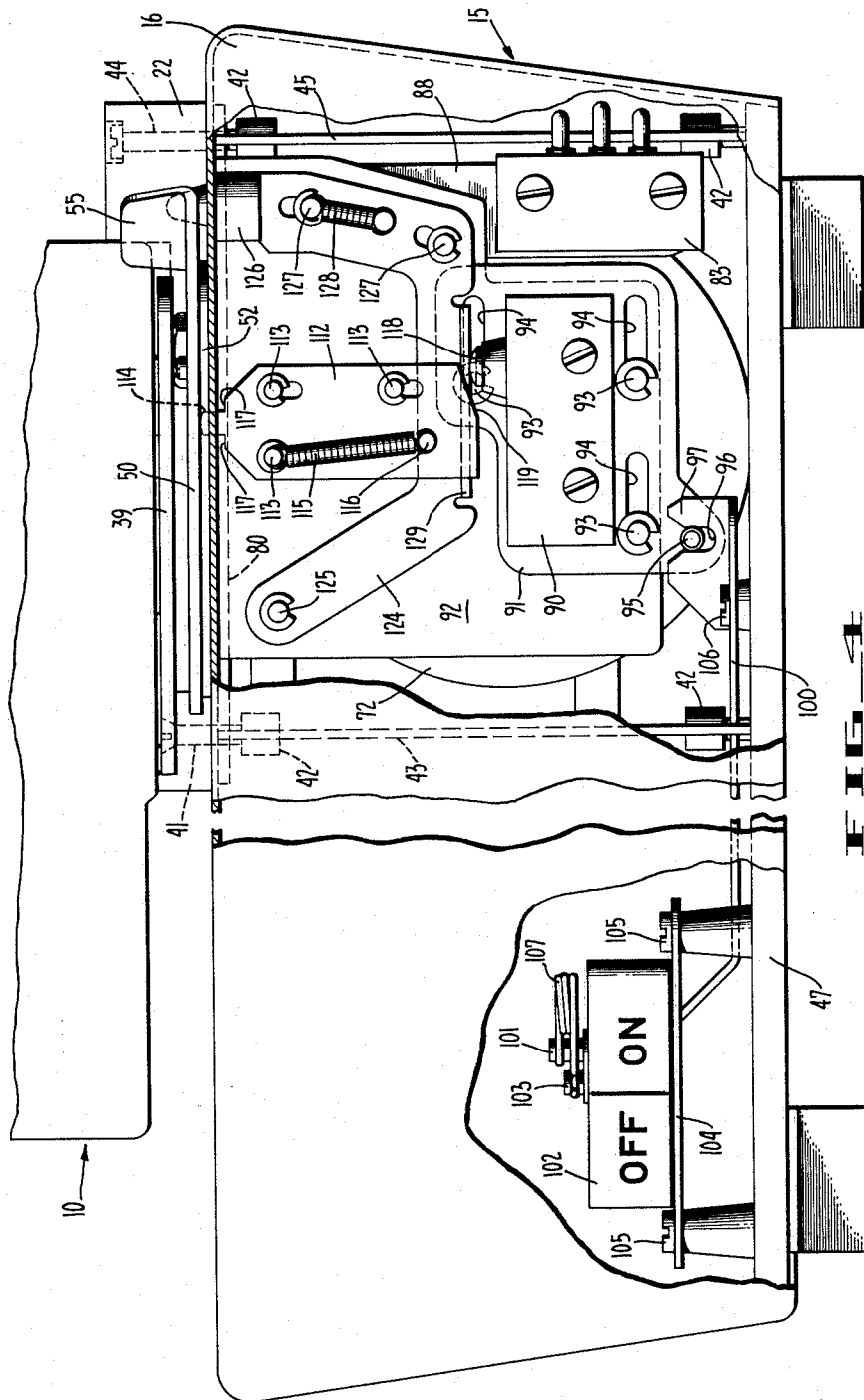
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POSTAGE METER

Filed April 3, 1962

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3,133,700

POSTAGE METER

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Filed Apr. 3, 1962, Ser. No. 184,824

6 Claims. (Cl. 235—101)

This invention relates to postage meters and more particularly to the motor drive mechanism and the means for controlling its operation.

It is an object of the present invention to provide a postage meter with a unitized motor drive and controls therefor.

Another object of the present invention is to provide the motor drive mechanism of a postage meter with manually operable controls in combination therewith for ease of assembly within such postage meter.

A further object of the invention is to provide a unitized motor drive and control mechanism for operating the removable portable meter of a postage metering device.

Other objects and advantages will be apparent from the following description of a preferred embodiment of the invention as illustrated in the accompanying drawings, in which:

FIG. 1 is a view of the postage metering device in perspective.

FIG. 2 is a plan view of the base portion of the metering device with the postage meter removed and a portion of the base cover broken away to show the motor switch control.

FIG. 3 is a fragmentary sectional elevational view of the base portion of the device showing the drive mechanism, the view being taken on planes indicated by the lines 3—3 in FIG. 2.

FIG. 4 is a fragmentary end elevational view of the base portion of the metering device with a portion of the cover broken away to show the motor and control unit.

The invention is shown as being embodied in a postage metering device of the type shown and described in the patent of Ingemar H. Lundquist, No. 3,107,854, issued October 22, 1963, and serves to control the operation of the portable "meter unit," generally indicated at 10 in FIG. 1. The device embodying the invention comprises generally the base portion 15 enclosed by cover 16 and having endless belt 17 supported for operation therein to convey mail matter past a printing station to receive a postmark impression thereon. The printing station consists of a conventional rotary town circle print drum and indicia print drum, neither of which is shown. The town circle print drum is operatively supported relative to the surface of the endless belt 17 within the housing 18 secured on the top surface of the base portion 15. Similarly, the indicia print drum is secured on shaft 19 suitably supported for rotation within the portable meter unit 10 and is operatively positioned relative to the surface of feed belt 17 in axially spaced parallel relationship to the town circle print drum, following the locking of the "meter unit" in operative position on base portion 15. Also enclosed within housing 18 is the print drum drive shaft 20 (FIG. 3) which serves, in a well-known manner, to control the synchronous cyclic rotation of the town circle print drum and the indicia print drum.

Shaft 20 is journaled at its respective ends in similar vertically disposed spaced parallel ears 21 (FIG. 3) of a bracket secured on an extension of the "meter unit" mounting plate 22. Intermediate the similar support-

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ing ears 21, shaft 20 carries a Geneva wheel 23 and a mutilated gear 24, each of which is secured on the shaft and is adapted for co-operation with the cam disk 25 and gear 26, respectively, secured on the print drum shaft 19 within the meter unit 10. Upon each cycle of rotation of shaft 20, Geneva wheel 23 and cam disk 25, together with the engagement of mutilated gear 24 with gear 26, control the cyclic rotation of the indicia print drum and the cyclic operation of the meter unit 10, following the locking of the meter in its operative position on base portion 15. Also secured on shaft 20 is a Geneva wheel and gear (not shown), similar to Geneva wheel 23 and gear 24, for controlling a cyclic rotation of the town circle print drum in synchronism with the indicia print drum in meter unit 10.

In order to control the cyclic operation of the Geneva wheel 23 and gear 24 (FIG. 3), a unidirectional cyclically operable clutch 30, of well-known construction is provided, having its driven side secured on shaft 20 and the driving side thereof rotatably mounted on the shaft 20. The driving side of clutch 30 is driven continuously by a motor-driven means, to be described hereinafter, and a timing belt 31 co-operating with a toothed pulley integral with the driving side of the clutch. The arcuate projection 32 of Geneva wheel 23 co-operates with the arcuate indentation in the periphery of cam disk 25 to initially prevent rotation of the shaft 19 and the indicia print drum in the meter unit 10 in the full-cycle position thereof. Likewise, the similar Geneva wheel 23 on shaft 20 functions in a similar manner to prevent rotation of the town circle printing drum in the full-cycle position hereof.

The cyclically operable clutch 30 operates in a well-known manner, upon engagement thereof, to effect a single cycle of rotation of shaft 20, thereafter becoming disengaged. Following the engagement of the clutch 30 and during the initial phase of the cyclic rotation of shaft 20, the arcuate projection 32 of Geneva wheel 23 prevents rotation of the indicia printing drum for a purpose not considered pertinent to the invention and therefore not described herein. Immediately upon rotation of the arcuate projection 32 out of engagement with the arcuate indentation in cam disk 25, the mutilated gear 24 becomes enmeshed with gear 26 to effect a single cycle of rotation of shaft 19 and the indicia print drum in meter unit 10. The cyclic rotation of the town circle printing drum is controlled in a similar manner to effect rotation of the town circle printing drum in synchronism with the indicia printing drum.

The foregoing description is believed to suffice for an understanding of the operational control of each of the printing drums, however, for a more complete description, reference is to be had to the afore-mentioned patent, No. 3,107,854.

As stated above and as seen in FIG. 3, in order to operate, the meter unit 10 must be secured in operating position upon the top surface of the cover 16 of base portion 15. Upon securing the "meter unit" in its operating position on the base portion 15, the cam disk 25 must be maintained in proper alignment for co-operation with the Geneva wheel 23 and gear 26 must be aligned with mutilated gear 24 for meshing engagement therewith, following the initial phase of each cycle of rotation of shaft 20. To assure proper alignment of these members, a guide shoe 36 is secured to the lower surface of the "meter unit" base by any suitable means and is maintained in spaced relationship to the base by means of a rectangular plate 37. The width of the rectangular plate 37 is slightly less than the narrower width dimension of opening 38 of plate 39 (FIG. 2), which is secured by any suitable means, such as flat head screws 40 and 41, on supporting plate 22 in a plane parallel with the top

surface of the base cover 16. In addition to securing the plate 39 on supporting member 22, each of the flat head screws 41 (FIG. 4) passes through a clearance aperture in supporting member 22 and the top of the cover 16 for threaded engagement with a circular nut 42 which is suitably secured in the frame member 43 and serves, upon threaded engagement by screw 41, to secure support member 22 along its one side to the top surface of the base portion 15. Similarly, along its other side, support member 22 is secured to base portion 15 by means of machine screws 44 which are passed through clearance apertures in member 22 and the top of cover 16 for threaded engagement with circular nuts 42 secured in frame member 45. Each of frame members 43 and 45 is secured on base plate 47 in a similar manner.

The edge contour of the guide shoe 36, secured on the "meter unit" base, is substantially identical to the inner edge contour of plate 39, but sufficiently smaller dimensionally to enable guide shoe 36 to drop through the opening in plate 39 and into the open end channel 46 in supporting plate 22, preparatory to movement of the meter unit 10 into its operative locked position. The thickness of the rectangular spacer plate 37 is slightly greater than the thickness of the plate 39 and the depth of the channel 46 is sufficiently greater than the thickness of guide shoe 36, so that meter unit 10 may be moved upwardly, as viewed in FIG. 2, while resting on plate 39 to secure the "meter unit" in its operative position on base portion 15.

As the guide shoe 36 settles into position within the confines of the channel 46 and with meter unit 10 resting on the top surface of plate 39, conventional means may be controlled to move the "meter unit" into the operative position shown in FIG. 3 and to thereafter lock the meter in place. For this purpose, the bellcrank 50 (FIG. 2) is pivotally supported by means of shoulder screw 51 on supporting plate 52, secured on the top surface of the cover 16 by the engagement of an aperture in the plate with the pin 53 on the cover and by means of screw 54. At its extremity, one arm of bellcrank 50 is provided with a vertically disposed lug 55 (FIGS. 3 and 4), which serves as a finger grip for controlling the movement of the bellcrank 50 from the meter releasing position, shown in full line in FIG. 2, to the locking position shown in phantom line therein, bellcrank 50 being resiliently maintained in either of its two positions by means of toggle spring 56. The other arm of bellcrank 50 pivotally supports one end of the link 57, the other end of which carries roller 58. Link 57 is disposed for freedom of movement in the substantially V-shaped channel 59 formed in the lower surface of the meter mounting plate 22 and roller 58 extends upwardly and is disposed in the elongated slot 60 within the web portion between channels 46 and 59 in plate 22. The length of the roller 58 is such that, when bellcrank 50 is in the position shown in full line in FIG. 2, an aperture in the guide shoe 36 will engage the roller 58 as the guide shoe drops into position within channel 46. Thus, it can be seen that following the engagement of roller 58 in the aperture in the guide shoe 36 and upon moving bellcrank 50 to the position indicated by phantom line in FIG. 2, the meter unit 10 will be moved to the left into its operative position, as seen in FIG. 3, wherein it becomes locked.

As explained hereinbefore, the driving side of the cyclically operable clutch 30 may be continuously driven, in a well-known manner, by means of timing belt 31 (FIG. 3) in engagement with a toothed pulley integrally formed with the driving side of the clutch and a similar toothed pulley secured on drive shaft 65. At its ends, shaft 65 is journaled in the framework of the machine and intermediate its ends is journaled in the bracket 66, which is secured on base plate 47 as well as being secured on frame member 43 in spaced relationship thereto by means of bolts 67. Also secured on shaft 65 is worm gear 68 enmeshed with worm 69 secured on shaft 70 journaled

in bracket 71 supported on bracket 66 by bolts 67. Shaft 70 is detachably connected to the shaft of motor 72 by means of flexible coupling 73.

The "meter unit" positioning mechanism as well as the drive mechanism are conventional and are therefore only briefly described herein. For a more complete description, reference is to be had to the aforementioned Patent No. 3,107,854.

The electric motor 72 including the operational components therefor, as well as means for selectively controlling the operation of the motor, is provided as a wholly independent unit to facilitate assembly and disassembly within the device. Motor 72 is of a conventional type and is resiliently supported in a well-known manner within the U-shaped carrier 78. Carrier 78, in turn, is riveted or otherwise secured to one leg 79 of an L-shaped bracket 80. In order to support the bracket 80 and therefore motor 72 within the base portion 15 of the device, suitable notches are provided in the top edge of each of frame members 43 and 45 (FIG. 4) having a depth equivalent to the thickness of the leg 79 of the bracket. Within these notches the leg 79 rests and through suitable apertures therein, the screws 41 and 44 are passed as they are threaded into circular nuts 42, thereby maintaining the surface of the leg 79 flush against the inner surface of the top of cover 16.

The various components related to the operation of motor 72, such as capacitor 81, starting relay 82 and terminal block 83, also form a part of the removable unit. Capacitor 81 is resiliently supported within a bracket 86 secured on the leg 79 of bracket 80 adjacent one end of carrier 78, while starting relay 82 is carried by a plate 87 secured on, and in spaced relation to, the left-hand leg of U-shaped carrier 78 (FIG. 3). Similarly, terminal block 83 is secured on an arm 88 formed downwardly from the web portion of the U-shaped carrier 78 in the same plane and adjacent the right-hand leg of the motor carrier 78 (FIGS. 3 and 4).

Energization of motor 72 is under the control of a normally open Micro Switch 90 secured on a plate 91 mounted for reciprocable sliding movement on the depending leg 92 of L-shaped bracket 80. The Micro Switch 90 and plate 91 are moved in a horizontal plane and are supported and guided in this movement by the engagement of pins 93 on legs 92 of bracket 80 in slots 94 in plate 91.

Either of two means may be utilized to effect energization of the motor 72, one such means may be selectively controlled to effect energization of the motor at all times, while the other of such means becomes effective to control the motor only while the meter unit 10 is locked in its operative position. During the assembly of the motor unit within the base portion 15 when it is positioned in the notches in the top edge of frame members 43 and 45 (FIG. 4), a roller 95 on plate 91 engages in a bifurcation 96 in a vertically disposed flange 97 formed at a right angle to a link 100 adjacent one end thereof. At its other, or offset, end, link 100 is pivotally mounted at 101 (FIG. 2) on the rearward end of a substantially T-shaped Off-On switch control 102 pivotally mounted at 103 for rocking movement in a horizontal plane on a plate 104 spaced from, and secured on, base plate 47 by means of screws 105. The crossbar portion of the T-shaped switch control 102, on the face of which "Off" and "On" are inscribed, extends through a suitable aperture in the end-wall of the cover 16 to enable the control to be rocked in one direction or the other, thereby moving the Micro Switch to the right or left through link 100. Link 100 is guided in its movement, above and parallel to base plate 47, by the engagement of a slot therein with a shoulder screw 106 supporting the link on a boss formed on base plate 47. Switch control member 102 is resiliently maintained in either of its rocked positions by means of toggle spring 107, one end of which is in engagement with the extended portion of pivot pin 101

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and the other end of which is in engagement with a pin 108 carried by plate 104 and extending upwardly through a suitable aperture in the control member. The extent of movement of the switch control member 102 in either direction is determined by the engagement of one wall or the other of the lengthwise parallel walls of the aperture therein with pin 108.

Normally, with meter unit 10 locked in its operative position on supporting plate 22, rocking of the switch control member 102 in a counter-clockwise direction, as viewed in FIG. 2, will effect a closing of Micro Switch 90 to cause energization of motor 72. However, if meter unit 10 has been moved to its inoperative position by the rocking of bellcrank 50 to the full line position shown in FIG. 2, the rocking of control member 102 to its "On" position will be ineffective to cause energization of the motor 72. For this purpose, a switch control plate 112 (FIGS. 3 and 4) is supported for vertical sliding movement on the depending leg 92 of bracket 80 by means of slots in plate 112, which are in engagement with the reduced diametral portion of shouldered pins 113 serving to maintain plate 112 in spaced parallel relationship to the surface of the leg 92. At its upper end, plate 112 is provided with a tooth-like extension 114 (FIGS. 2 and 4) which projects upwardly through a suitable aperture in the top of cover 16 and in support plate 52. A spring 115, supported at its one end on the extended end of pin 113 and at its other end on a pin 116 carried by plate 112, normally serves to urge plate 112 upwardly to a position determined by the engagement of shoulders 117 of plate 112 with the inner surface of the top of cover 16. When in this position, the arcuate end of the tooth-like projection 114 extends above plate 52 sufficiently for engagement by bellcrank 50, as it is moved from the full line position shown in FIG. 2 to the phantom line position shown therein, thereby moving plate 112 downwardly. The lower end portion of plate 112 (FIG. 3) is offset for alignment with switch control button 118 of Micro Switch 90 and is provided with a camming edge 119. Thus, it can be seen that following the movement of bellcrank 50 to the meter locking position indicated by phantom line in FIG. 2 and the movement of the plate 112 downwardly, the camming edge 119 (FIG. 4) becomes operatively related to switch button 118, but does not depress the button. However, as switch control member 102 is rocked counter-clockwise, as viewed in FIG. 2, to the "On" position, Micro Switch 90 is moved to the left in FIG. 4 so that the button 118 of the switch engages the camming edge 119, thereby depressing the button to energize motor 72. On the other hand, if bellcrank 50 has been moved to the full line position shown in FIG. 2 to unlock meter unit 10 for its removal from the base portion 15, plate 112 moves upwardly, under the urgency of spring 115, to remove the camming edge 119 of the plate from its operative position relative to button 118 of Micro Switch 90. Therefore, a subsequent rocking of switch control member 102 from the "Off" to the "On" position will be ineffective to energize motor 72, thereby preventing the possibility of causing rotation of shaft 20 and, thus, Geneva wheel 23 and mutilated gear 24 out of cyclic phase relation to the cam disk 25 and driven gear 26 of the meter unit 10, following the removal of the meter.

If, for any reason, operation of meter unit 10 should be terminated before the return of the cyclically operable clutch 30 to its full-cycle position, e.g., because of a mechanical failure within the meter, the switch control member 102 would be rocked to its "Off" position and the meter would be removed from the base portion 15 for servicing. Before replacing the meter, it then becomes necessary to restore clutch 30 to its full-cycle position which, upon operation of motor 72, is effected in a well-known manner as described in the afore-mentioned patent No. 3,107,854, so that Geneva wheel 23 and mutilated gear 24 (FIG. 3) will be in proper cyclic phase relation

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with disk 25 and gear 26, respectively, of the meter unit 10. For this purpose, a substantially U-shaped lever 124 is pivotally mounted at its one end at 125 on the depending leg 92 of bracket 80 and, at its other end, is provided with a finger button 126 having a reduced diametral conical portion extending through a suitable aperture in the top of cover 16. Lever 124 is rockable about pivot 125 and is guided in its movement and maintained in parallel relationship to the leg 92 of bracket 80 by means of shouldered pins 127 engaged in suitable arcuate slots within the right-hand arm of the lever. Normally, a spring 128 serves to resiliently urge lever 124 to the counter-clockwise rocked position determined by the engagement of the shoulder on finger button 126 with the lower surface of the top of cover 16. Along the lower edge of the horizontally disposed portion of the U-shaped lever 124, a flange 129 is formed extending outwardly at a right angle thereto sufficiently to overlie switch control button 118. Thus, it becomes apparent that a depression of the finger button 126, prior to the replacement of the meter unit 10 on base portion 15, will effect energization of motor 72 to ensure the return of the cyclic clutch 30 to its full-cycle position, whereupon the clutch becomes disengaged even though the motor drive may run indefinitely for as long as finger button 126 is held depressed.

We claim:

1. In a motor driven mechanism for operating a postage meter, a framework for removably supporting said postage meter in an operative position, a cyclically operable drive means, means for driving said meter connectable with said cyclically operable drive means upon operatively positioning said meter on said framework, manually operable means for moving said meter to and thereafter locking it in the operative position, a motor detachably connected to said cyclically operable drive means, a clutch interposed between said motor and said drive means to control cyclic operation of said drive means, means for supporting said motor in said framework, a switch means mounted on said supporting means for movement selectively to one of two positions to control operation of said motor, a first manipulative means operable upon manipulation thereof to selectively control the movement of said switch means to either of its two positions, a second manipulative means carried by said supporting means effective upon operation thereof to effect operation of said switch in either of its two positions to control the energization of said motor, and a switch control means mounted on said supporting means movable from a normally inactive position relative to said switch means to an active position relative thereto upon operation of said manually operable means and the movement of said meter to its operative position thereby enabling engagement of said switch with said last named control means to effect energization of said motor upon manipulation of said first manipulative means to move said switch to said one position.

2. In a motor driven mechanism for operating a postage meter, a framework for removably supporting said postage meter in an operative position, a cyclically operable drive means, a clutch having a full-cycle position operable upon engagement thereof to effect a cycle of operation of said drive means, means associated with said meter engageable with said drive means to control a cyclic operation of said meter upon movement of said meter to its operative position, means adjustable from an unlocking to a locking position to effect movement of said meter to its operative position, a detachable motor means for driving said clutch, means removably mounted in said framework operable to support said motor, a switch adjustably mounted on said motor support means for movement in either of two directions to control the energization or de-energization of said motor, adjusting means connectable with said switch upon mounting said

motor support means in said framework operable to selectively control movement of said switch in either direction, means rendered operable by said adjustable means in the locking position thereof to effect operation of said switch and the energization of said motor upon movement of said switch in one of said two directions, and a manipulative means for selectively operating said switch to energize said motor subsequent to the movement of said switch in either said one direction with said adjustable means in the unlocking position or in the other of said two directions thereby enabling the return of said clutch to its full-cycle position when displaced therefrom.

3. In a motor driven mechanism for a postage metering device, a framework, a cyclically operable drive means supported in said framework, a meter detachably mounted on said framework and movable into engagement with said drive means for control thereby, adjustable means for controlling the movement of said meter into and out of engagement with said cyclically operable drive means, a motor for controlling operation of said cyclically operable drive means including a detachable means for supporting said motor in said framework, motor control means shiftable on said supporting means to either of two positions operable in one of said positions to effect energization of said motor, manually operable shift control means connectable with said motor control means upon placement of said supporting means in said framework and subsequently operative to control shifting movement of said motor control means, and means mounted on said supporting means movable by said adjustable means from an inoperative to an operative position for effecting operation of said motor control means upon movement thereof to said one of said positions subsequent to the engagement of said meter with said cyclically operable drive means.

4. In a postage metering device having a framework, a cyclically operable drive means supported in said framework, a cyclic clutch for controlling operation of said drive means, a meter mounted on said framework movable from an inoperative to an operative position relative to said cyclically operable drive means to control the operation thereof, means adjustable to effect movement of said meter and to lock said meter in its operative position, and means for driving said clutch, the combination comprising a coupling means, a bracket removably supported in said framework, a motor carried by said bracket and detachably connected to said coupling, means, a switch means for controlling the energization of

said motor and supported on said bracket for movement to either an active or an inactive position, a manually operable means connectable with said switch means upon positioning said bracket in said framework and operable to control the movement of said switch means, and a switch control means mounted on said bracket for adjustment from a normally inoperative to an operative position relative to said switch means, the adjustment of said switch control means being controlled by said adjustable means as said meter is moved to its operative position whereby said switch means engages said switch control means operating said switch means to energize said motor upon operation of said manually operable means to move said switch means to its active position.

5. In a device of the character described in claim 4, said switch means comprising a plate for supporting the switch and mounted for reciprocatory movement on said bracket relative to said switch control means, a roller on said plate engageable with said manually operable means upon placement of said bracket in said framework, and a depressible member associated with said switch effective to engage said switch control means to operate said switch upon movement of said plate by said manually operable means from an inactive to an active position.

6. In a device of the character described in claim 5, said switch control means comprising a member slidably adjustable on said bracket from an inoperative to an operative position relative to said depressible member, said slidable member having a projection at one end for controlling the adjustment of said member by said adjustable means and a cam surface at its other end effective in the operative position of said slidable member to operate said depressible member upon movement of said plate from the inactive to the active position, and means normally biasing said slidable member to its inoperative position wherein the said projection is engaged by said adjustable means upon movement of said meter to its operative position thereby moving said slidable member to its operative position.

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