Dec. 1, 1964 L. A. WOOLLEY 3,159,255

TIMER SHAFT CONSTRUCTION

Filed Sept. 27, 1961 2 Sheets-Sheet 1

FIG. 1

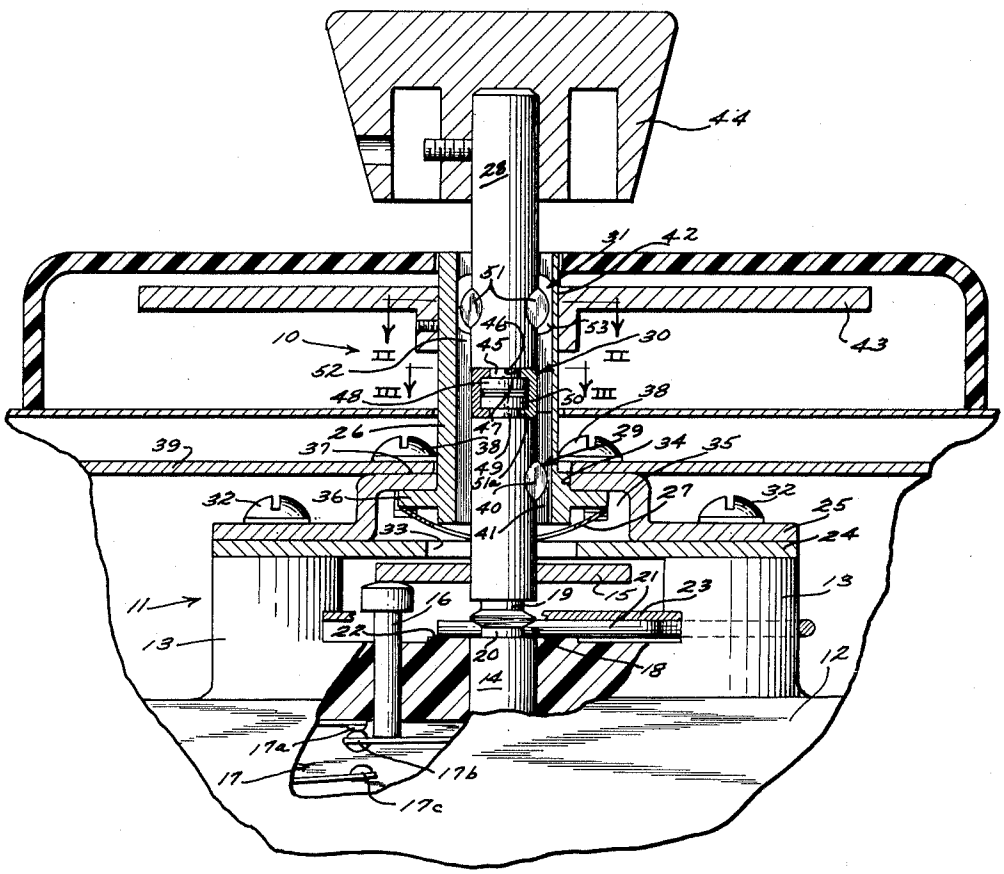
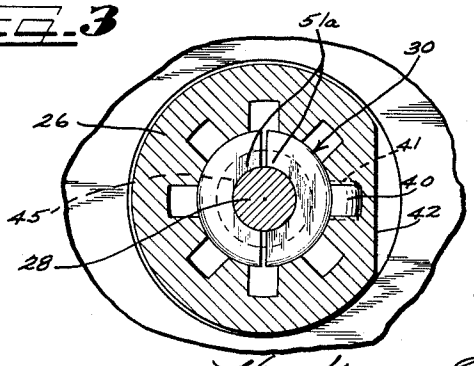


FIG. 3



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TIMER SHAFT CONSTRUCTION

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FIG. 3

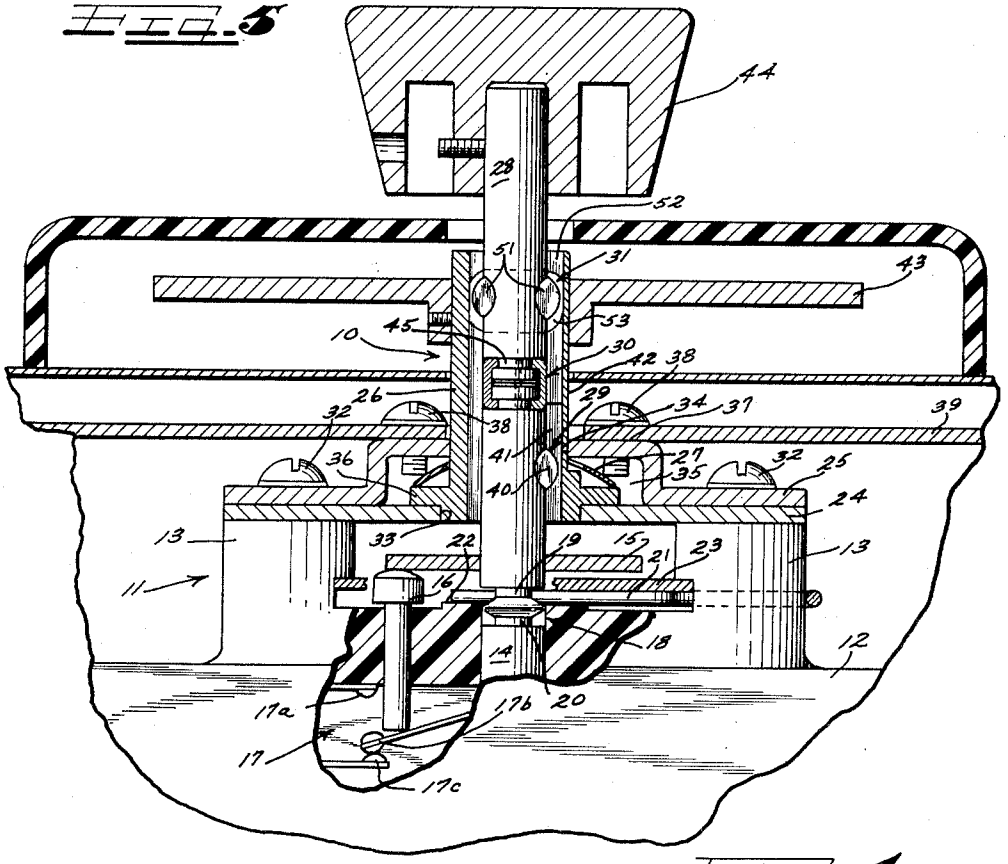


FIG. 4

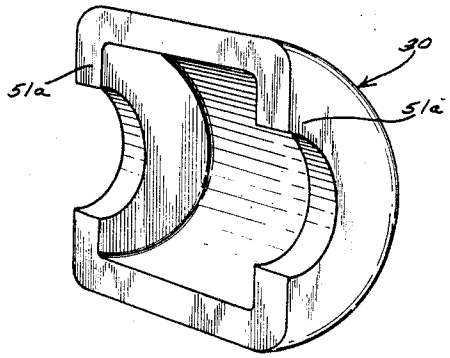
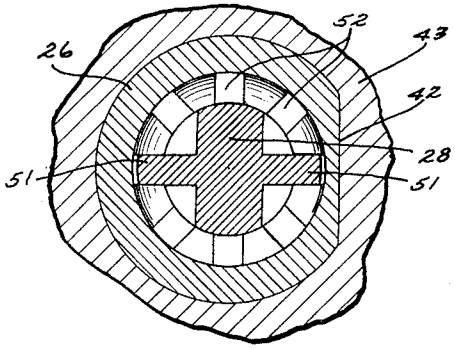


FIG. 2



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United States Patent Office 3,159,255 Patented Dec. 1, 1964

3,159,255

TIMER SHAFT CONSTRUCTION

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Filed Sept. 27, 1961, Ser. No. 141,137
12 Claims. (Cl. 192—67)

This invention relates generally to sequential timers, and more specifically to an improved manual drive mechanism for the shaft thereof.

Although the principles of the present invention may be included in various devices, a particularly useful application is made of the same as an attachment for sequential timers of the type employed to operate and to regulate home laundry appliances. In particular, such timers employ a program cam or cam assembly which is rotated by a motor in one direction to close the proper combination of circuits at predetermined times, and to open the same. Such circuits control the washing, extracting, rinsing, drying, and the like of a washing machine. Frequently, the operator desires to alter the prescribed program, and therefore the timer typically includes a manual knob for advancing the main timing cam. Frequently, the various switches operated by the main timing cam are of such a type that reverse rotation of the timing cam would damage them. Accordingly, it is known in the art to include means as a part of the timer to prevent inadvertent reverse rotation of the main timing cam.

Thus when the main timing cam is manually advanced in the proper direction, if this be done with the circuits energizable, the washing machine components are caused to pass quickly through their various cycles, there being a resulting banging and clanking of relays, solenoids, and the like in response to such rapid manual advancement of the main timing cam.

The present invention contemplates the utilization of improved structure which eliminates such actuation of various controls in response to manual advancement of the timer. To this end, in accordance with the principles of this invention, a timer shaft construction is provided for use with timers of the type which employ an axially shiftable timer shaft, the axial movement of which opens and closes a master switch in the timer. A preferred embodiment of the instant invention may be utilized either with a timer of the type where the shaft is pushed into the timer to open the master switch, or with a timer of the type where the timer shaft is pulled slightly outwardly from the timer to open the master switch. Moreover, a preferred embodiment of the manual drive mechanism for the timer switch is one which has a relatively short axial extent, thereby facilitating installation of the same in appliance control panels of relatively shallow depth. Still further, the instant invention is especially adapted to be constructed as an attachment whereby the same may be added to known or pre-existing timer mechanisms for which there is production tooling, without any modification of such tooling.

Accordingly, it is an object of the present invention to provide an improved manual drive mechanism for a sequence timer.

Another object of the present invention is to provide a manual drive mechanism for a sequence timer shaft which is so constructed that the shaft may be rotated by hand only after the same has been manually positioned in that axial position in which the control system is entirely de-energized.

Yet another object of the present invention is to provide a manual drive mechanism for a sequence timer shaft which may be constructed as an attachment for use with pre-existing timers without modification of the same.

A still further object of the present invention is to

provide a manual drive mechanism for a sequence timer shaft which is constructible in a rather short length so that the same may be employed with shallow control panels.

A still further object of the present invention is to provide a manual drive mechanism comprising a number of parts which may be employed selectively with either a timer whose shaft is pulled to stop the mechanism, or with a timer whose shaft is pushed to stop the mechanism controlled thereby.

Many other advantages, features and additional objects of the present invention will become manifest to those versed in the art upon making reference to the detailed description and the accompanying sheets of drawings in which a preferred structural embodiment incorporating the principles of the present invention is shown by way of illustrative example.

On the drawings:

FIGURE 1 is a fragmentary enlarged cross-sectional view of a sequential timer equipped with a manual drive mechanism provided in accordance with the principles of the present invention;

FIGURE 2 is a cross-sectional view, taken along line II—II of FIGURE 1;

FIGURE 3 is a cross-sectional view, taken along line III—III of FIGURE 1;

FIGURE 4 is a perspective view of a detail part employed in the structure of FIGURE 1; and

FIGURE 5 is a view illustrating the structure of FIGURE 1 assembled in an alternative manner.

As shown on the drawings:

The principles of this invention are particularly useful when embodied in a manual drive mechanism such as is illustrated in FIGURE 1, generally indicated by the numeral **10**. The drive mechanism **10** forms an attachment for a sequential timer assembly or sequence timer generally indicated by the numeral **11**. The sequence timer **11** includes a housing **12** having mounting bosses **13**, and a rotatable timer shaft **14** which is rotatably mounted by the housing **12** in a manner which enables selective reciprocation thereof to either of two axial positions. The timer shaft **14** carries an annular disk **15** rigidly secured thereto which coacts with a switch actuator **16** slidably carried by the housing **12** for operating a switch generally indicated by the numeral **17**. The switch **17** is a master switch and is illustrated as being of the single pole double throw type. It will be noted that when the timer shaft **14** is pushed inwardly, the contact **17***a* is in open relation to the movable contact **17***b* so that the contacts **17***a* and **17***b* may be employed as the master switch which is opened by pushing the shaft **14** inwardly.

To hold the shaft **14** in a selected axial position, a detent mechanism generally indicated at **18** is provided. To this end, the shaft **14** has a pair of annular grooves **19**, **20** within one of which is received a wire member **21** supported by one of the bosses **13**, the wire member **21** being held in position between a face **22** on the housing **12** and a locking plate **23** by such locking plate **23** which is received in grooves in the bosses **13** as shown. Thus the timer shaft member **14** is supported in a manner wherein it can rotate, and wherein it is axially reciprocable to either of two axial positions. The other details of the timer are well known in the art and need not be elaborated on herein.

The preferred embodiment of the manual drive mechanism **10** of the instant invention includes a pair of bracket members **24**, **25**, a tubular sleeve **26**, an annular spring **27**, and an extension shaft **28**. There is provided a rotational driving connection generally indicated at **29** between the tubular sleeve **26** and the timer shaft **14**. There is also provided axial coupling means generally indicated at **30** between the timer shaft and the extension

shaft. Still further, there is provided a disengageable rotational driving connection generally indicated at 31 between the extension shaft 28 and the tubular sleeve 26.

The bracket members 24, 25 are adapted to be secured to the timer in fixed relation thereto, and thus may be referred to or considered as stationary portions of the timer. In this embodiment, screws 32 pass through both of the brackets 24, 25 into the bosses 13 to form a rigid connection therebetween. Each of the brackets 24, 25 is provided with means which respectively defines an aperture 33 in the bracket member 24 and an aperture 34 in the bracket member 25. The apertures 33 and 34 are axially aligned with each other and the timer shaft 14 extends therethrough. It is to be noted that the means which defines the apertures 33 and 34 are axially spaced so as to define a space 35 between the bracket members 24 and 25 at such apertures. The spring 27 is disposed within the space 35 as is also a flange 36 which is an external annular flange rigidly secured to the sleeve 26, being integral therewith in this embodiment. The bracket member 25 is provided with a face 37 which is adapted to serve as a mounting face and is provided with a number of threaded apertures into which screws 38 may pass for supporting the manual drive mechanism 10 and timer 11 on a mounting panel 39. The mounting panel 39 comprises a portion of the appliance with which the instant device is to be used.

The tubular sleeve 26 receives the end of the timer shaft 14 which projects from the housing. The rotational driving connection 29 insures that the sleeve 26 and the timer shaft 14 will be corotatable. In the instant embodiment, the timer shaft 14 is provided with a lug 40 which is received within a slot 41 in the sleeve 26 in a manner which permits the sleeve 26 to slide with respect to the lug 40, and which enables the lug 40 to slide with respect to the sleeve 26. It is preferable that there be only one such slot as the slot 41 so that the sleeve 26 may slidably engage with the end of the timer shaft 14 at only one relative angular rotational position or relationship. Where other slots may be provided, the slot 41 and the lug 40 are both enlarged to insure, in a preferred embodiment, that there is only one such relative rotational position. In this embodiment, the sleeve 26 has a slabbed-off or flat surface 42 at one portion of its periphery, which periphery is adapted to support an indicator dial 43. Thus the flat surface 42 provides a periphery for the sleeve 26 which is of noncircular configuration which insures corotation between the dial 43 and the sleeve 26, as well as insures that there is only one relative angular rotational position of assembly therebetween. By this structure, the dial 43 can only be assembled into a predetermined angular relationship with respect to the timer.

The annular spring 27, here illustrated as being of the wave washer type, extends about the timer shaft 14 as well as about a peripheral portion of the sleeve 26. As shown in FIGURE 1, the annular spring 27 acts between the sleeve flange 36 and the bracket member 24 to bias the sleeve member 36 into yieldable engagement with the bracket member 25.

The extension shaft 28 has an end slidably received within the sleeve 26, and an opposite end projecting therefrom to which a knob 44 is attached. The extension shaft 28 is rotatably supported by the sleeve 26 in axial alignment with the timer shaft 14. Within the sleeve 26, the extension shaft 28 is provided with a peripheral groove 45 defined by oppositely directed shoulders 46, 47, the groove 45 being spaced from the actual end of the extension shaft 28 by a reduced diameter portion 48. In this embodiment, the timer shaft 14 is provided with identical structure including a groove 49 and a reduced diameter portion 50. These peripheral grooves 45, 49 receive the axial coupling means 30 which is in the form of a clip illustrated in FIGURE 4. Two of these clips may be employed, each extending for a distance peripherally about the reduced diameter portions 48, 50 of both shafts 28, 14. The axial coupling clip 30 includes an inwardly radially projecting lip 51*a* at each axial end thereof which is received within the grooves 45, 49 for cooperation with the shoulders which define such grooves The axial coupling means 30 thus provides structure by which the extension shaft 28 and the timer shaft 14 are jointly reciprocable, and by which the extension shaft 28 and the timer shaft 14 are freely relatively rotatable.

The disengageable rotational driving connection between the extension shaft 28 and the tubular sleeve 26 comprises structure which in this embodiment includes engaging means projecting radially from the extension shaft 28, such engaging means having the form of a pair of lugs 51, 51. In this embodiment, the lugs 51, 51 are so disposed and have such radial extent that they are at all times within the sleeve 26. To cooperate with the radially projecting lugs 51, the tubular sleeve 26 is provided with a series of angularly spaced internal slots 52 which slidably receive the lugs 51 and which have an extent substantially parallel to the axis of the sleeve 26. The drive mechanism 10 is so constructed that the engaging means or lugs 51 may be reciprocated in a direction parallel to the axis of the shaft to a position where the engaging means or lugs 51 are withdrawn from the slots 52. In this embodiment, and to that end, there is provided an internal annular recess 53 in the sleeve 26 at a point which is axially adjacent to the slots 52, which recess receives the radially projecting engaging means or lugs 51 and which enables the lugs 51 to rotate freely with respect to the sleeve 26 when axially aligned with such recess 53. Thus for one axial position of the shafts 28, 14, the rotational driving connection 31 effects a driving relationship between the extension shaft 28 and the sleeve 26, while in the other axial position of the shafts 28, 14, the rotational driving connection 31 is disengaged since the lugs 51 are retracted from the slots 52.

The structure as shown in FIGURE 1 has the shafts 28 and 14 in an outward position with the master switch 17 closed, thereby enabling the timer 11 to regulate such devices as it normally controls. If an attempt is made to change the timer setting by rotation of the knob 44, it is evident that the extension shaft and knob will rotate, but nothing else will happen. However, if the lugs 51 are first aligned with a pair of slots 52, and the knob 44 pushed inwardly, at the same time that the driving connection 31 is placed into an actual driving relationship, the master switch 17 will be opened. Thus when the mechanical connection is established between the knob 44 and the timer shaft 14, the timer 11 will of necessity be deenergized. After the timer 11 has then been manually set as may be desired, the driving connection between the knob and the timer shaft 14 is disengaged at substantially the same time that the master switch 17 is reclosed.

In the event that the extension shaft 28 is rotated with respect to the sleeve 26 to a point where the lugs 51 are exactly out of line with respect to the slots 52, or are exactly in line with the means which defines the slots 52, and if thereafter the knob 44 and extension shaft 28 are pushed inwardly, the master switch 17 will open and the spring 27 will yield. It may be expected that the detent structure 13 will not be overpowered by the spring 27. However, if the knob 44 is then rotated, the lugs 51 will slide with respect to the sleeve 26 to a point where the lugs 51 are aligned with the slots 52, at which instant the spring 27 will move the sleeve 26 axially, thereby re-establishing the driving condition of the driving connection 31.

Referring now to FIGURE 5, it will be noted that the structure of FIGURE 1, has been reassembled with the spring 27 disposed on the opposite side of the flange 36 so that it acts between the flange 36 and the bracket member 25 to urge the flange member 36 against the bracket member 24. Under these conditions, the drive

mechanism **10** is adapted to cooperate with a timer **11** which is provided with a master switch **17** that requires that the timer shaft **14** be pulled outwardly to open the timer master switch **17**, herein illustrated by the contacts **17***b* and **17***c*. With this arrangement, the lugs **51** cooperate with that portion of the slots **52** which lies between the recess **53** and the outward end of the tubular sleeve **26**.

From the foregoing, it is evident that the objects of this invention have been met, it being particularly evident that the disclosed manual drive mechanism is entirely external so that it may be employed with any timer having a reciprocable shaft, that it is of relatively short axial construction, and that the same set of components may be utilized both with timers that require the shaft to be pushed and with timers that require the shaft to be pulled to open the master switches thereof. Thus by mere choice as to which of two positions the spring **27** is to be disposed, the manual drive mechanism **10** may be selectively employed with either type of timer.

Although various minor modifications might be suggested by those versed in the art, it should be understood that I wish to embody within the scope of the patent warranted hereon all such embodiments as reasonably and properly come within the scope of my contribution to the art.

I claim as my invention:

1. A manual drive mechanism for a sequence timer, comprising in combination:

(*a*) an axially reciprocable timer shaft supported by the timer for rotation about its axis;

(*b*) a tubular sleeve slidably receiving an end of the reciprocable timer shaft, which shaft terminates therein, said sleeve having means providing a slidable rotational driving connection therewith;

(*c*) an extension shaft having an end slidably received in and terminating within said sleeve in axial alignment with the timer shaft;

(*d*) coupling means disposed within said sleeve and connecting said extension shaft to the timer shaft in a manner providing joint axial movability and free relative rotation of said shaft; and

(*e*) engaging means on said extension shaft providing a rotational driving connection with said sleeve in one axial position of said shafts, and enabling free rotation of said extension shaft within said sleeve in another axial position of said shafts.

2. A manual drive mechanism for a sequence timer, comprising in combination:

(*a*) an axially reciprocable timer shaft supported by the timer for rotation about its axis;

(*b*) a tubular sleeve slidably receiving an end of the reciprocable timer shaft, which shaft terminates therein, said sleeve having means providing a slidable rotational driving connection therewith;

(*c*) an extension shaft having an end slidably received in and terminating within said sleeve in axial alignment with the timer shaft;

(*d*) coupling means disposed within said sleeve and connecting said extension shaft to the timer shaft in a manner providing joint axial movability and free relative rotation of said shafts;

(*e*) engaging means on said extension shaft providing a rotational driving connection with said sleeve in one axial position of said shafts, and enabling free rotation of said extension shaft within said sleeve in another axial position of said shafts; and

(*f*) a spring biasing said sleeve in an axial direction and yieldable in response to movement of said shafts toward said one axial position when said engaging means is angularly misaligned from its driving position

3. A manual drive mechanism for a sequence timer, comprising in combination:

(*a*) an axially reciprocable timer shaft supported by the timer for rotation about its axis;

(*b*) a tubular sleeve slidably receiving an end of the reciprocable timer shaft, which shaft terminates therein, said sleeve having means providing a slidable rotational driving connection therewith, said sleeve having a radially outwardly projecting flange rigidly secured thereto;

(*c*) an extension shaft having an end slidably received in and terminating within said sleeve in axial alignment with the timer shaft;

(*d*) coupling means disposed within said sleeve and connecting said extension shaft to the timer shaft in a manner providing joint axial movability and free relative rotation of said shafts;

(*e*) engaging means on said extension shaft providing a rotational driving connection with said sleeve in one axial position of said shafts, and enabling free rotation of said extension shaft within said sleeve in another axial position of said shafts; and

(*f*) a spring acting between a first stationary portion of the timer and said flange and urging said flange in an axial direction into engagement with a second stationary portion of the timer, said spring being yieldable in response to movement of said shafts toward said one axial position when said engaging means is angularly misaligned from its driving position.

4. A manual drive mechanism for a sequence timer, comprising in combination:

(*a*) an axially reciprocable timer shaft supported by the timer for rotation about its axis;

(*b*) a tubular sleeve slidably receiving an end of the reciprocable timer shaft, which shaft terminates therein, said sleeve having means providing a slidable rotational driving connection therewith, said sleeve having a radially outwardly projecting flange rigidly secured thereto;

(*c*) an extension shaft having an end slidably received in and terminating within said sleeve in axial alignment with the timer shaft;

(*d*) coupling means disposed within said sleeve and connecting said extension shaft to the timer shaft in a manner providing joint axial movability and free relative rotation of said shafts;

(*e*) engaging means on said extension shaft providing a rotational driving connection with said sleeve in one axial position of said shafts, and enabling free rotation of said extension shaft within said sleeve in another axial position of said shafts; and

(*f*) a spring selectively placeable during assembly on either side of said flange in engagement therewith and biasing said sleeve in a selected axial direction and yieldable in response to movement of said shafts toward said one axial position when said engaging means is angularly misaligned from its driving position.

5. A manual drive mechanism for a sequence timer, comprising in combination:

(*a*) an axially reciprocable timer shaft supported by the timer for rotation about its axis;

(*b*) a tubular sleeve slidably receiving an end of the reciprocable timer shaft, which shaft terminates therein, said sleeve having means providing a slidable rotational driving connection therewith;

(*c*) an extension shaft having an end slidably received in and terminating within said sleeve in axial alignment with the timer shaft;

(*d*) coupling means disposed within said sleeve and connecting said extension shaft to the timer shaft in a manner providing joint axial movability and free relative rotation of said shafts;

(*e*) engaging means on said extension shaft providing a rotational driving connection with said sleeve in one axial position of said shafts, and enabling free

rotation of said extension shaft within said sleeve in another axial position of said shafts; and

(*f*) a dial directly supported on the outer periphery of said sleeve and indicating the timer setting.

6. A manual drive mechanism for a sequence timer, comprising in combination:

(*a*) an axially reciprocable timer shaft supported by the timer for rotation about its axis;

(*b*) a tubular sleeve slidably receiving an end of the reciprocable timer shaft, which shaft terminates therein, said sleeve having means engageable with said timer shaft at only one rotational position of said sleeve relative to said timer shaft and providing a slidable rotational driving connection therewith;

(*c*) an extension shaft having an end slidably received in and terminating within said sleeve in axial alignment with the timer shaft;

(*d*) coupling means disposed within said sleeve and connecting said extension shaft to the timer shaft in a manner providing joint axial movability and free relative rotation of said shafts; and

(*e*) engaging means on said extension shaft providing a rotational driving connection with said sleeve in one axial position of said shafts, and enabling free rotation of said extension shaft within said sleeve in another axial position of said shafts.

7. A manual drive mechanism for a sequence timer, comprising in combination:

(*a*) an axially reciprocable timer shaft supported by the timer for rotation about its axis;

(*b*) a tubular sleeve slidably receiving an end of the reciprocable timer shaft, which shaft terminates therein, said sleeve having means providing a slidable rotational driving connection therewith, said sleeve also having means integral therewith defining an internal slot having an extent in a direction parallel to the sleeve axis and an annular recess opening radially inwardly and disposed axially adjacent to said slot;

(*c*) an extension shaft having an end slidably received in and terminating within said sleeve in axial alignment with the timer shaft;

(*d*) coupling means disposed within said sleeve and connecting said extension shaft to the timer shaft in a manner providing joint axial movability and free relative rotation of said shafts; and

(*e*) engaging means integral with said extension shaft, projecting radially outwardly therefrom, and received in said sleeve slot to provide a rotational driving connection between said extension shaft and said sleeve in one axial position of said shafts, and received in said annular recess in said sleeve to enable free rotation of said extension shaft with respect to said timer shaft in another axial position of said shafts.

8. A manual drive mechanism for a sequence timer, comprising in combination:

(*a*) an axially reciprocable timer shaft supported by the timer for rotation about its axis;

(*b*) a tubular sleeve slidably receiving an end of the reciprocable timer shaft, which shaft terminates therein, said sleeve having means providing a slidable rotational driving connection therewith;

(*c*) an extension shaft having an end slidably received in and terminating within said sleeve in axial alignment with the timer shaft;

(*d*) coupling means disposed within said sleeve and connecting said extension shaft to the timer shaft in a manner providing joint axial movability and free relative rotation of said shafts;

(*e*) engaging means on said extension shaft providing a rotational driving connection with said sleeve in one axial position of said shafts, and enabling free rotation of said extension shaft within said sleeve in another axial position of said shafts; and

(*f*) an annular spring surrounding said timer shaft and acting between a stationary portion of the timer and said sleeve, and urging said sleeve in an axial direction, and yieldable in response to movement of said shafts toward said one axial position when said engaging means is angularly misaligned from its driving position.

9. A manual drive mechanism for a sequence timer, comprising in combination:

(*a*) an axially reciprocable timer shaft supported by the timer for rotation about its axis;

(*b*) a tubular sleeve slidably receiving an end of the reciprocable timer shaft, which shaft terminates therein, said sleeve having means providing a slidable rotational driving connection therewith, said sleeve having a radially outwardly projecting flange rigidly secured thereto;

(*c*) an extension shaft having an end slidably received in and terminating within said sleeve in axial alignment with the timer shaft;

(*d*) coupling means disposed within said sleeve and connecting said extension shaft to the timer shaft in a manner providing joint axial movability and free relative rotation of said shafts;

(*e*) engaging means on said extension shaft providing a rotational driving connection with said sleeve in one axial position of said shafts, and enabling free rotation of said extension shaft within said sleeve in another axial position of said shafts;

(*f*) a pair of bracket members rigidly secured to the timer, and each having means defining an aperture which is axially aligned and spaced from the other aperture and through which apertures said timer shaft freely extends; and

(*g*) a spring, said spring and said sleeve flange being disposed between said spaced aperture-defining-means, said spring acting between one of said bracket members and said flange and normally urging said flange in an axial direction into engagement with the other of said bracket members, said spring being yieldable in response to movement of said shafts toward said one axial position when said engaging means is angularly misaligned from its driving position.

10. A manual drive mechanism for a sequence timer, comprising in combination:

(*a*) an axially reciprocable timer shaft supported by the timer for rotation about its axis;

(*b*) a tubular sleeve slidably receiving an end of the reciprocable timer shaft, which shaft terminates therein, said sleeve having means providing a slidable rotational driving connection therewith, said sleeve having a radially outwardly projecting flange rigidly secured thereto;

(*c*) an extension shaft having an end slidably received in and terminating within said sleeve in axial alignment with the timer shaft;

(*d*) coupling means disposed within said sleeve and connecting said extension shaft to the timer shaft in a manner providing joint axial movability and free relative rotation of said shafts;

(*e*) engaging means on said extension shaft providing a rotational driving connection with said sleeve in one axial position of said shafts, and enabling free rotation of said extension shaft within said sleeve in another axial position of said shafts;

(*f*) a pair of bracket members rigidly secured to the timer, and each having means defining an aperture which is axially aligned and spaced from the other aperture and through which apertures said timer shaft freely extends, one of said brackets having further means by which it and the timer can be supported; and

(*g*) a spring, said spring and said sleeve flange being disposed between said spaced aperture-defining-

means, said spring acting between one of said bracket members and said flange and normally urging said flange in an axial direction into engagement with the other of said bracket members, said spring being yieldable in response to movement of said shafts toward said one axial position when said engaging means is angularly misaligned from its driving position.

11. A manual drive mechanism for a sequence timer, comprising in combination:

(*a*) an axially reciprocable timer shaft supported by the timer for rotation about its axis;

(*b*) a tubular sleeve slidably receiving an end of the reciprocable timer shaft, which shaft terminates therein, said sleeve having means providing a slidable rotational driving connection therewith;

(*c*) an extension shaft having an end slidably received in and terminating within said sleeve in axial alignment with the timer shaft;

(*d*) coupling means disposed within said sleeve and connecting said extension shaft to the timer shaft in a manner providing joint axial movability and free relative rotation of said shafts, said coupling means being engaged by the interior of said sleeve and retained thereby in operative engagement with said shafts; and

(*e*) engaging means on said extension shaft providing a rotational driving connection wtih said sleeve in one axial position of said shafts, and enabling free rotation of said extension shaft within said sleeve in another axial position of said shafts.

12. A manual drive mechanism for a sequence timer, comprising in combination:

(*a*) an axially reciprocable timer shaft supported by the timer for rotation about its axis;

(*b*) a tubular sleeve slidably receiving an end of the reciprocable timer shaft, which shaft terminates therein, said sleeve having means engageable with said timer shaft at only one rotational position of said sleeve relative to said timer shaft and providing a slidable rotational driving connection therewith, said sleeve having a radially outwardly projecting flange rigidly secured thereto, said sleeve also having means integral therewith defining an internal slot having an extent in a direction parallel to the sleeve axis and an annular recess opening radially inwardly and disposed axially adjacent to said slot;

(*c*) an extension shaft having an end slidably received in and terminating within said sleeve in axial alignment with the timer shaft;

(*d*) coupling means disposed within said sleeve and connecting said extension shaft to the timer shaft in a manner providing joint axial movability and free relative rotation of said shafts, said coupling means being engaged by the interior of said sleeve and retained thereby in operative engagement with said shafts;

(*e*) engaging means integral with said extension shaft, projecting radially outwardly therefrom, and received in said sleeve slot to provide a rotational driving connection between said extension shaft and said sleeve in one axial position of said shafts, and received in said annular recess in said sleeve to enable free rotation of said extension shaft with respect to said timer shaft in another axial position of said shafts;

(*f*) a dial directly supported on the outer periphery of said sleeve and indicating the timer setting;

(*g*) a pair of bracket members rigidly secured to the timer, and each having means defining an aperture which is axially aligned and spaced from the other aperture and through which apertures said timer shaft freely extends, one of said brackets having further means by which it and the timer can be supported; and

(*h*) an annular spring selectively placeable during assembly on either side of said flange in surrounding relation to said timer shaft, said spring and said sleeve flange being disposed between said spaced aperture-defining-means, said spring acting between one of said bracket members and said flange and normally urging said flange in a selected axial direction into engagement with the other of said bracket members, said spring being yieldable in response to movement of said shafts toward said one axial position when said engaging means is angularly misaligned from its driving position.

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