March 4, 1930. T. N. HICKS 1,749,185

BACK WIND MECHANISM FOR CLOCKS

Filed June 23, 1927

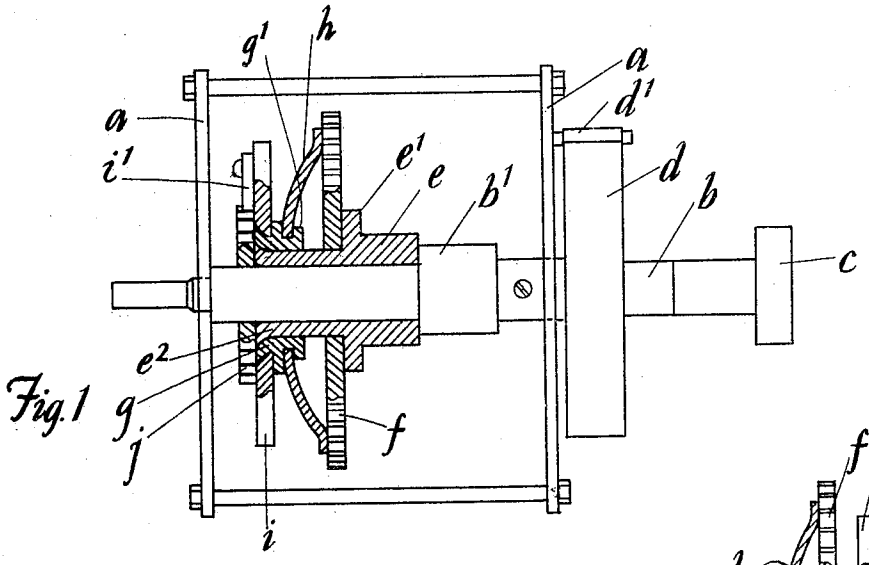


Fig. 1

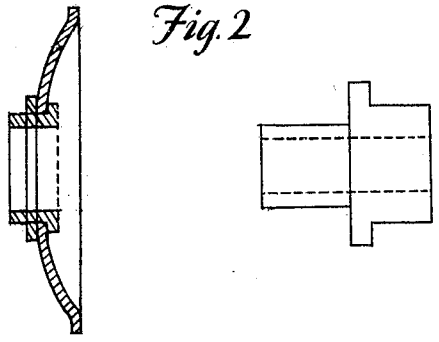


Fig. 2

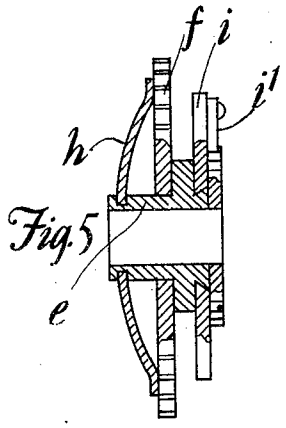


Fig. 5

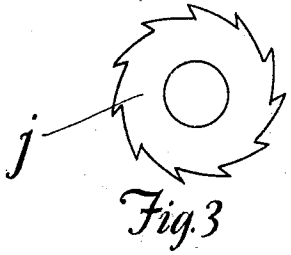


Fig. 3

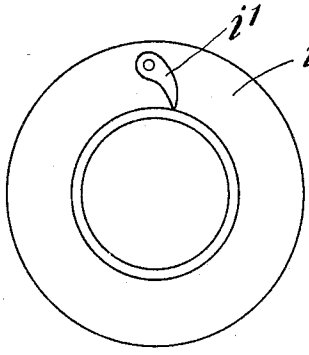


Fig. 4

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BY Redding, Greeley, Kiss, O'Shea & Campbell ATTORNEYS.

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UNITED STATES PATENT OFFICE

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BACK WIND MECHANISM FOR CLOCKS

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The present invention relates to timing devices, particularly of the type adapted to be set to run for a predetermined time, at the end of which, the device stops running and an alarm is simultaneously sounded, giving notice that the predetermined interval of time has elapsed.

It frequently becomes desirable to maintain a given condition for a definite length of time at the end of which certain operations are to be effected and as a means of measuring the time as well as automatically giving notice of its lapse, clocks have been designed to operate for a predetermined time, at the end of which an alarm is sounded, the interval of time being set initially as desired. For example, where it is desired to cook an object for five minutes, the clock is adjusted to run for such time, at the end of which time an alarm is sounded.

When the above device has once been set, it is necessary to permit it to function completely through the clock train before it can be reset to operate for a different period of time, and in this respect it does not meet all of the conditions arising in such service.

This invention has for an object the provision of a back wind mechanism which, when once set for a given operation, may be adjusted to operate for a shorter period of time than that initially selected, without necessitating the driving of the clock train to the extent originally selected. The manner in which such operation is effected is by means of a friction clutch connected between the clock train and the main spring whereby the latter may be unwound without driving the clock train by slipping the clutch connection therebetween.

A further object of the invention is to provide a back wind mechanism of the above character, which, by means of a slip clutch as described above, permits of a greater number of adjustments with a given construction.

Other and further objects will appear as the description proceeds and reference will now be had to the accompanying drawings for a more detailed description of the invention, wherein:

Figure 1 is an elevation, partly in section, showing a preferred form of the invention.

Figure 2 is an elevation of certain elements of the device shown in Figure 1, with certain portions thereof separated and ready for assembling.

Figure 3 is an elevation of the ratchet wheel shown in Figure 1, and which is not included as one of the elements of Figure 2.

Figure 4 is an elevation of the disc, also shown in Figure 1, but not included in Figure 2.

Figure 5 is an elevation showing a modified form of the invention.

Referring particularly to Figure 1, *a* indicates the frame of a clock of any desired form, the clock mechanism being removed in the interest of clearness. At *b* is shown an arbor carried between frame members *a*, and having a winding knob *c* secured to one end thereof. A main spring *d* is secured to the shaft at one end and at the other end to the frame as at *d'*.

The arbor *b* is provided with a shoulder *b'* against which a hub *e* is adapted to rest. Hub *e* is provided with a flange *e'* against which a driving gear *f* abuts. Over an extended portion e^2 of hub *e* a sleeve *g* is carried, one end of the sleeve having a spring disc *h* secured to it, as for example, by means of shoulders *g'* turned over and riveted to secure it in place.

At the other end of the sleeve, a disc *i* is carried, the ends of the projecting portion e^2 of the hub, and the sleeve being turned back to rivet the sleeve and disc securely to the same. The manner in which these elements are riveted in a single operation is clearly shown in Figure 1 and it will be noted that the hub *e*, together with the gear wheel *f*, spring disc *h* and disc *i* is carried as a unit on the arbor *b*.

A ratchet wheel *j* is securely mounted on the arbor *b* and disc *i* carries a pawl *i'* which engages the ratchet wheel *j* to cause the hub *e* to rotate with the arbor *b* when the latter turns in one direction.

Figure 5 illustrates a modification of the form shown in Figures 1 to 4, wherein the hub *e* carries disc *i* at the other end, to en-

gage the ratchet wheel of the arbor. The elements operate in the same manner as the elements shown in Figures 1 to 4. The construction shown in Figure 5 eliminates, however, the sleeve *g* which carries the disc *i* and spring disc *h* of the first form. In the modified construction, the spring disc *h* is riveted directly to the end of the hub *e*.

The operation of the device is as follows. Assuming that there are twelve teeth on the ratchet wheel, and that one revolution of the ratchet wheel represents a period of one hour of operation of the clock train, then each tooth of the ratchet wheel represents five minutes operation. With the spring *d* completely unwound, the knob *c* is turned to wind the spring, and simultaneously move the ratchet wheel under the pawl. If it is desired that the clock operate for ten minutes, the knob is turned until the pawl *i* rides over two of the ratchet teeth, and engages behind the second tooth. Upon releasing the knob *c*, the spring is permitted to unwind and return the ratchet wheel to its original position. This motion is transmitted through the pawl and disc *i*, spring disc *h*, and gear wheel *f*, to the clock train (not shown) which steps off the time. Assuming, with the above construction, that it is desired to cook for three minutes only, the knob *c*, is turned to move the ratchet wheel one tooth under the pawl *i'*. Having been moved to this position, the knob *c* is turned in the reverse direction a distance representing two-fifths of the length of one tooth. It is to be understood, of course, that a suitable dial may be provided, calibrated in minutes as well as intervals of five minutes to facilitate the accurate setting in such circumstances. With reverse movement of the knob *c*, the spring disc *h* slips over the side of the gear *f*, since the escapement mechanism of the clock prevents rotation of the gear in such direction above a predetermined speed. The spring *d*, therefore, is unwound an extent representing two minutes of operation, so that the complete setting operation for a three minute period causes, first, a winding of the spring *d* for a five minute run, and then an unwinding for two minutes as described above.

It is to be noted that the type of slip clutch connection described herein is very compact and easy to assemble, all of the parts being secured in operative relation by a single operation.

This invention is not to be understood as covering all forms of slip clutch connections, but only extends to back wind mechanisms of the above character, and of the construction as set forth in the accompanying claims.

What I claim is:

1. In a device of the character described, an arbor, a driving spring connected thereto, means to wind the spring, a hub mounted on the arbor, a gear carried by the hub, a clutch connection between the gear and hub, a ratchet secured to the arbor, and a pawl mounted on the hub to engage the ratchet.

2. In a device of the character described, an arbor, a driving spring connected thereto, means to wind the spring, a hub mounted on the arbor, a gear loosely mounted on the hub, a sleeve secured to the hub, a spring clutch member carried by the sleeve and engaging the gear, a pawl carried by the sleeve, and a ratchet wheel secured to the arbor.

3. In a device of the character described, an arbor, a driving spring connected thereto, means to wind the spring, a hub mounted on the arbor, a flange on the hub, a gear loosely mounted on the hub and abutting the flange, a sleeve secured to the hub, a spring clutch member carried by the sleeve and engaging the gear to force it against the flange, a disc carried by the sleeve, a pawl on the disc, and a ratchet wheel secured to the arbor and engaged by the pawl.

4. In a device of the character described, an arbor, a driving spring connected thereto, means to wind the spring, a hub mounted on the arbor, a flange on the hub, a gear loosely mounted on the hub and abutting the flange, a sleeve on the hub, a spring clutch member riveted to one end of the sleeve and engaging the gear to force it against the flange, a disc carried at the other end of the sleeve, a pawl on the disc, a ratchet wheel secured to the arbor and engaged by the pawl and rivet connections between the arbor, sleeve and disc whereby they are secured in a single operation.

This specification signed this 18th day of June, A. D. 1927.

THOMAS N. HICKS.