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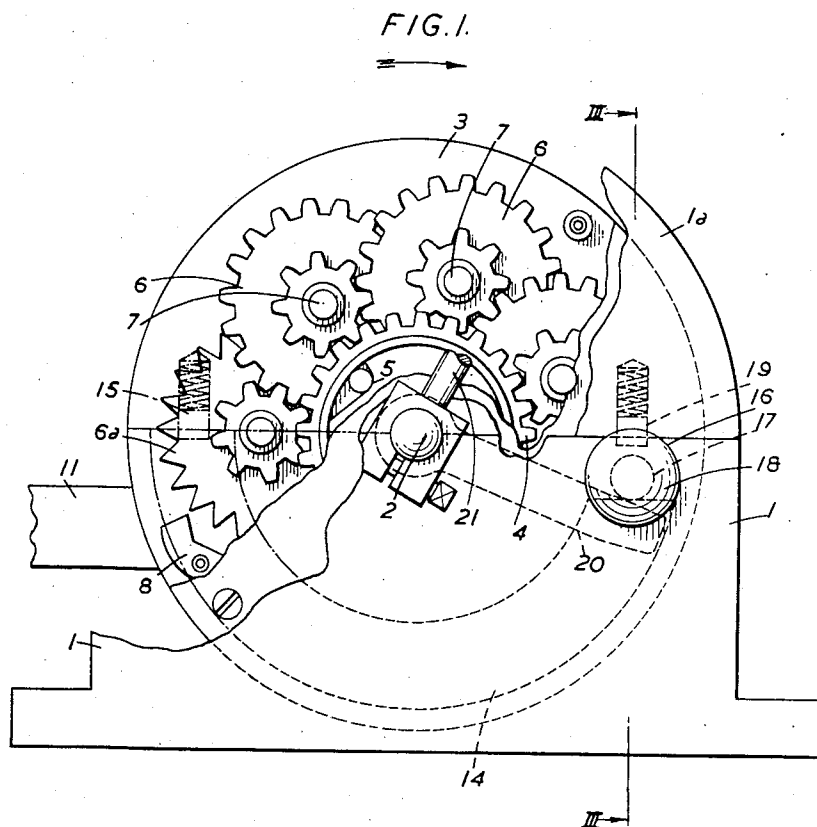
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2,470,003

TIME CONSUMING OR DELAY ACTION MECHANISM

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2 Sheets-Sheet 1



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FIG.2.

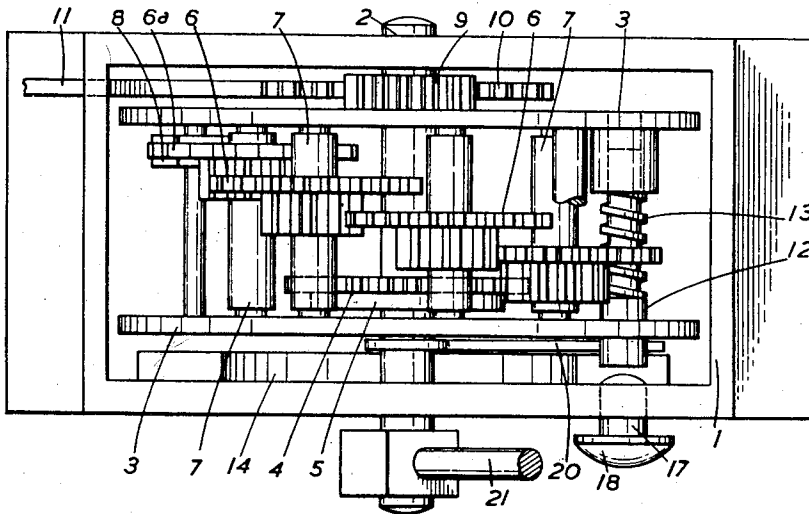
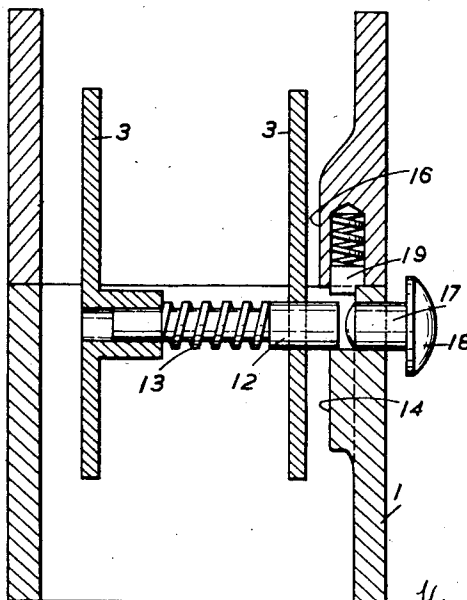


FIG. 3.



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TIME CONSUMING OR DELAY ACTION
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This invention relates to time consuming or delay action mechanism for use with electrical or mechanical apparatus in which it is desired to retard or delay the return or movement of a member between operations, and has for its object to construct such a mechanism in an improved manner.

According to this invention, the mechanism broadly incorporates a main shaft, actuating means for turning the main shaft, a rotatable member rotatably mounted in relation to the main shaft, a train of gear wheels controlled by an escapement or other retarding means, carried by the rotatable member, a gear wheel on the main shaft co-operating with the train of gears, means for braking or holding the rotatable member, and means movable with the main shaft for disengaging the braking or holding means during a portion of the stroke of the actuating means, so arranged that whilst the rotatable member is held the main shaft has to drive the train of gear wheels and consequently has a slow or retarded movement and when the braking or holding means is released the rotatable member moves with the main shaft to allow an un-retarded or quick movement.

Preferably the means for disengaging the braking or holding means is adjustable in relation to the actuating means so that the duration of the slow portion of the stroke in relation to the fast portion of the stroke can be varied without altering the full or normal stroke or movement of the actuating means.

The invention will be clearly understood from the following description aided by the accompanying drawings in which:

Figure 1 is an end view, partly in section, of a mechanism showing one example of carrying the invention into effect.

Figure 2 is a plan view with the top of the case removed, and

Figure 3 is a section on the line III—III of Figure 1.

The invention can be carried into effect in various ways as to detailed construction.

In the example shown on the accompanying drawings, the apparatus incorporates a non-rotatable case 1 having a circular box closed at both ends. Conveniently the case 1 is formed of a lower portion 1 having a movable top half 1a.

In the case 1 and centrally thereof is rotatably mounted a main shaft 2 around which and within the case 1 is rotatably mounted a drum 3 or cylinder so arranged that the main shaft 2 is rotatable in the case 1 and the drum 3 is rotatable in the case 1 and around the main shaft 2.

A gear wheel 4 is rotatably mounted on the main shaft 2 adapted to be coupled to the main shaft 2 by a free wheel 5.

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The gear wheel 4 meshes with a train of gear wheels 6 carried on suitable spindles 7 or stubs in the drum 3, the last gear wheel 6a co-acting with an escapement 8 rockably mounted in the drum 3, or with other suitable controlling means.

The main shaft 2 in this example is provided with a toothed wheel 9 adapted to be actuated by a rack 10 in an operating arm 11 or lever from outside the case 1. The main shaft 2 could be operated by any other suitable means, such as a lever arm secured to the main shaft 2, or by coupling the main shaft 2 directly to the actuating mechanism.

Near the edge of the drum 3 is a slidable plunger 12 carried in suitable bearings in the drum 3 and normally urged in one direction by a spring 13. On the inside of the front wall of the case 1 is a circular projecting ledge 14 or strip extending from a hole in the case 1 for the required distance and terminating in a projecting stop 15, which may conveniently comprise a spring urged plunger in the front wall of the case 1a. A stop 16 is provided on the wall on the other side of the hole. In the hole is slidably located a stud 17 preferably having a rounded or domed head 18 on the outside. Any suitable means are provided for slidably retaining the stud 17 in the hole.

The spring 13 and plunger 12 are so arranged that normally the plunger 12 moves out far enough for its head to engage in the gap between the end of the ledge 14 and the stop 16 so that the drum is held as will be seen in Figure 3.

19 is a spring urged plunger located in the stop 16 to act as a resilient buffer for the plunger 12.

On the main shaft 2 and between the drum 3 and the front wall of the case 1 is secured a return lever 20 and on the main shaft 2 and outside the case 1 is secured a release lever 21 adapted to be adjusted in a circular movement on the main shaft 2 and fixed thereto, the release lever 21 being adapted to co-act with the head 18 of the stud 17.

The release lever 21 is adjusted on the main shaft 2 to a suitable position for the desired delay or slow movement in relation to the fast or un-retarded movement.

Any number or arrangement of gear wheels may be provided in the train of gear wheels.

In normal condition with the actuating lever at the beginning of its stroke, the drum 3 is positioned so that the head of the plunger 12 is engaged in the gap between the ledge 14 and stop 16 and with the return lever 20 next to the plunger 12 as shown in Figure 1, the release lever 21 being adjusted to the position required to give the required slow or un-retarded motion.

On turning the main shaft 2 in the direction of the arrow (Figure 1) the free wheel 5 comes into action and locks the main shaft 2 to the gear

wheel 4. During the first portion of the stroke of the actuating arm 11, the drum 3 is held by the head of the plunger 12 engaging with the end of the ledge 14 as will be seen in Figure 3 so that the main shaft 2 has to rotate the train of gear wheels 4 which is controlled by the escapement 8 or retarding means, and the movement of the actuating arm 11 is slow or retarded. At the end of the slow movement the release lever 21, which moves with the main shaft 2, engages with the head 18 of the stud 17 and presses same in for its inner end to engage and move the plunger 12 inwards until its head is free of the end of the ledge 14 and thus frees the drum 3 so that it turns with the main shaft 2 for the remainder of the stroke at a fast or un-retarded rate. When the head of the plunger 12 is moved in by the stud 17 it engages on the face of the ledge 14 and rides on same without braking or retarding the movement of the drum 3. The return lever 20 is fixed to the main shaft 2 and moves with same so that as the main shaft 2 is turned the return lever 20 moves away from the plunger 12. The ledge 14 is of sufficient length to hold the plunger 12 during the whole of the maximum retarded movement for which the release lever 21 may be adjusted and for the return lever 20 to come against the stop 15 to limit the movement of the main shaft 2 in the forward direction.

On the return stroke, the free wheel 5 is uncoupled from the gear wheel 4 so that the main shaft 2 can return at a fast or un-retarded rate. As the main shaft 2 turns in the reverse direction the return lever 20 will engage with the plunger 12 and turn the drum 3 until the plunger 12 reaches the end of the ledge 14 and under action of the spring 13 passes into the gap between the end of the ledge 14 and stop 16, the plunger 12 acting as a resilient buffer to the head of the plunger 12 on the return movement to obviate any jamming of the device which might occur. When the drum 3 has reached this position the return lever 20 engaging with the plunger 12 will act as a stop to limit the return movement of the main shaft 2 and the device will be ready for a repeat operation.

It will be understood that the delay is governed by the setting of the release lever 21 in relation to the full movement or stroke of the actuating means so that a pre-determined slow or delay movement is thereby obtained and a free or fast movement is also obtained without altering or varying the normal stroke of the actuating means.

Various other constructions and modifications may be employed within the scope of the following claims.

What I claim as my invention is:

1. A time consuming or delay action mechanism incorporating a main shaft, actuating means for turning the main shaft, a rotatable member rotatably mounted in relation to the main shaft, a train of gear wheels controlled by retarding means and carried by the rotatable member, a gear wheel on the main shaft co-operating with the train of gears, means for holding the rotatable member during a stroke of the actuating means in one direction, and means movable with the main shaft for dis-engaging the holding means during a portion of the said stroke of the actuating means, so arranged that whilst the rotatable member is held the main shaft has to drive the train of gear wheels and consequently

has a slow or retarded movement and when the holding means is released the rotatable member moves with the main shaft to allow an un-retarded or quick movement.

2. A time consuming or delay action mechanism as claimed in claim 1, wherein said means for disengaging said holding means is adjustable in relation to said actuating means so that the duration of the slow portion of said stroke of said actuating means in relation to the fast portion of said stroke of said actuating means can be varied without altering or varying the normal extent of said stroke of the actuating means.

3. A time consuming or delay action mechanism as claimed in claim 1, wherein said main shaft is coupled to said gear wheel on the main shaft by a free wheel device to allow of a quick return movement of the actuating means, and means provided on the main shaft adapted to engage and return the rotatable member to normal position on the return stroke of the actuating means, substantially as set forth.

4. A time consuming or delay action mechanism comprising a case, a main shaft rotatably mounted in said case, a drum rotatably mounted on said main shaft within the case a gear wheel coupled by a free wheel device to said main shaft, a train of gear wheels controlled by retarding means and mounted in said drum and meshing with said gear wheel, actuating means for turning the main shaft, means for holding said drum during a stroke of the actuating means in one direction, means movable with the main shaft for disengaging the holding means during a portion of said stroke of the actuating means, and return means carried by the main shaft for engaging the drum on the return movement of the actuating means, substantially as and for the purpose set forth.

5. A time consuming or delay action mechanism as claimed in claim 4, wherein said holding means comprise a spring urged plunger carried by said drum, a stop having a circular ledge on the inner face of the case, a stud slidable in a hole in the case with the inner end adjacent the stop, and a release lever adjustably secured to the main shaft and adapted to co-operate with the stud, substantially as set forth.

6. A time consuming or delay action mechanism as claimed in claim 4, wherein said drum carries a spring-urged plunger, and said return means comprises an arm secured to the main shaft in advance of said plunger.

7. A time consuming or delay action mechanism as claimed in claim 4, wherein said drum carries a spring-urged plunger, and including an arcuate ledge on the case on which said plunger rides and forming a stop, and opposite the ledge stop, substantially as and for the purpose set forth.

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