April 9, 1957 C. M. BLUMENFELD 2,788,068

CONTROL DEVICE

Filed Feb. 15, 1954

FIG_1

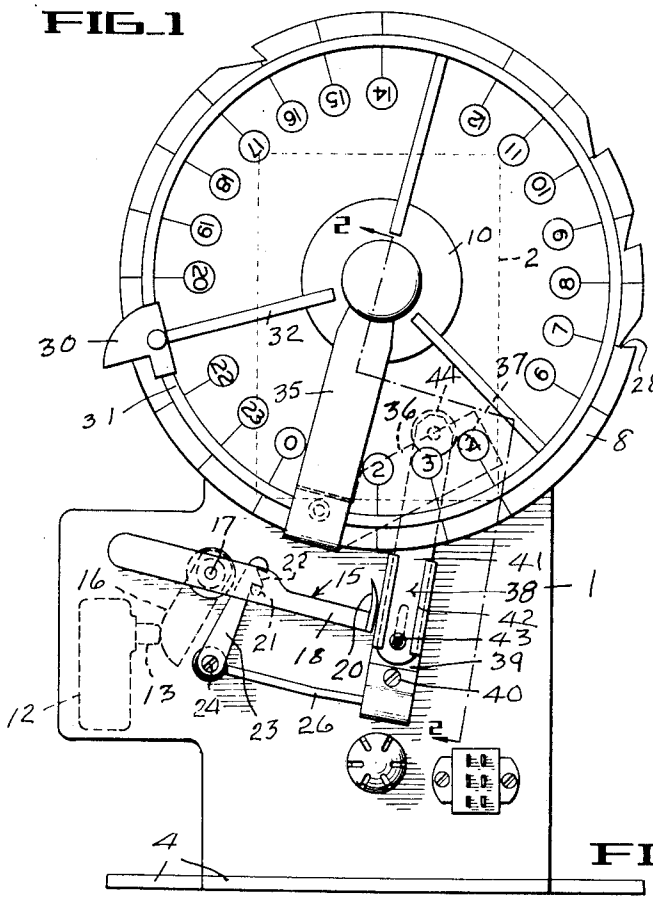


FIG_2

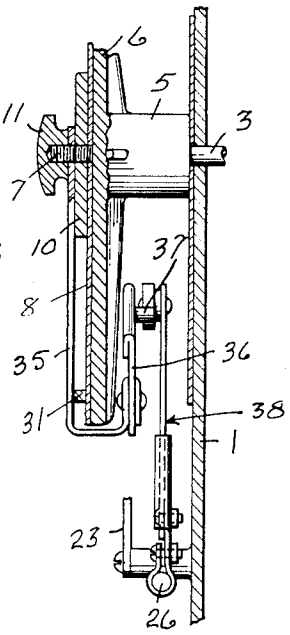


FIG_3

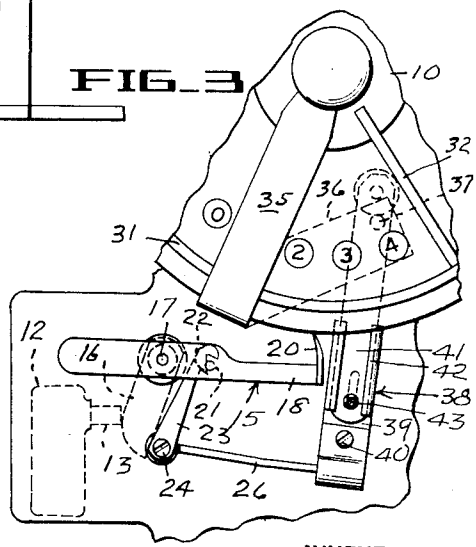
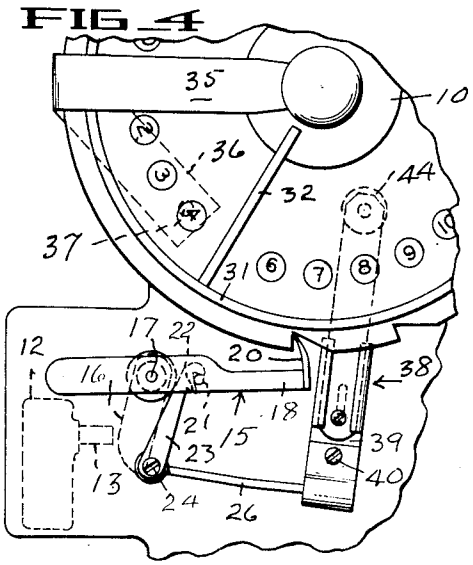


FIG_4



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CONTROL DEVICE

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2 Claims. (Cl. 161—1)

This invention relates to a time control device and an attachment for use on a time control device.

In hospital and in other laboratories apparatus is used for moving tissue specimens or slides through a series of solutions, and the control device for such apparatus is a power driven rotary disc having a notched periphery or outer edge, on which edge, a tooth on the end of a switch actuating lever is adapted to ride. This disc is power driven at a predetermined rate of say once in twenty-four hours for tissues or once in one hour for slides. The notches in the disc may, of course, be spaced at different points for actuating the switch lever at different time intervals, and different numbers of notches may be used according to the particular requirements.

The particular device hereinafter disclosed is for use with an electric clock motor that drives the disc one revolution in twenty-four hours.

Heretofore, in most laboratories, tissues are prepared each day of the week, except Sunday, and are ready at the end of twenty-four hours for the next step. Sunday is usually omitted for the reason that, if the tissues were prepared and started through the solutions on Saturday, they would be ready for the next step on Sunday when no one would be in the laboratory. Thus twenty-four hours would be lost, which, in many instances, is quite important.

One of the objects of the present invention is a combination or device that will automatically start the operation of the tissues through the solutions at the desired time during a holiday, such as Sunday, so that the tissues will be ready for such further steps as may be necessary, at an hour in a regular working day when someone will be present.

A still further object of the invention is the provision of a simple, economically built attachment for a conventional control device that is well known in laboratories and hospitals under the trade name of "Technicon," and which attachment can be readily and quickly secured to said device without altering the latter, and when so attached, will function to automatically start the desired operations on tissues at a time when no one is present, and so that the treatment of the tissues will be completed at a time when someone will be present to take care of them.

Other objects and advantages will appear in the description and in the drawings.

In the drawings,

Fig. 1 is a front elevational view of a conventional control device with my attachment secured thereto.

Fig. 2 is a sectional view taken along line 2—2 of Fig. 1, but omitting the clock housing and switch housing.

Fig. 3 is a fragmentary front elevational view showing my attachment in a position on the device of Fig. 1 in which the switch actuating device is being released to place the control device into operation.

Fig. 4 is a fragmentary front elevational view showing my attachment in a position on the device of Fig. 1, in which it has been placed in operation and the switch is actuated.

In detail the conventional apparatus illustrated comprises a vertical support in the form of a vertical plate 1 that has clock housing 2 (Fig. 1) secured to the rear side, which housing encloses the usual electric clock and gear train for revolving a driven shaft 3 (Fig. 2) at (in the present illustration) one revolution each twenty-four hours.

The plate 1 may be formed with a base or flange 4 (Fig. 1) for supporting it on a table or horizontal surface.

Secured on the shaft 3 is a hub 5 (Fig. 2) that is rigid with a circular plate 6, and an externally threaded stub shaft 7 projects from the side of plate 6 opposite to the hub 5, and is coaxial with said hub.

A centrally apertured circular disc 8 is adapted to be positioned against the front side of plate 6 with the shaft 7 extending through the central aperture in said disc, and an annular washer 10 is held against the front side of the disc 8 by a nut 11 that is threaded onto the shaft 7.

In this description, the "front" side of the vertical supporting plate 1 is the side nearest the plate 6 and the "rear" side is the opposite side of said plate. Wherever the words "front," "rear," "forwardly" or "rearwardly," or words of similar meaning are used, they are used with reference to the front and rear side of plate 1.

Secured on the rear side of plate 1 is the usual switch housing 12 (Fig. 1) that contains a switch and a spring urged switch actuating button 13 that is spring urged at all times in a direction outwardly of the housing 12, and when this button is in its innermost position, as seen in Figs. 1 and 3, the circuit leading to the switch is broken, but when the switch button is in its outermost position (Fig. 4) the switch is closed and apparatus (not shown) to be actuated for changing solutions or other operations, will be actuated when said switch is closed.

A switch actuating lever 15, which is generally in the form of a crank has an arm section 16 projecting from one side of pivot 17 that supports the section 16 at the rear side of plate 1, and the other arm section 18 is at the front side of plate 1 and extends generally horizontally below the edge of disc 8 and has a fairly wide tooth 20 at its outer end that extends upwardly toward the lower edge of said disc.

Arm section 18 also has a laterally projecting pin 21 thereon at a point between tooth 20 and pivot 17 and this pin is adapted to be releasably engaged by a tooth 22 adjacent to the upper end of a latch element 23. The latch element 23 is pivoted to the front side of plate 1 by a pivot 24 at its lower end.

The latch element has a hub at its lower end through which pivot 24 extends, and a generally horizontally extending arm 26 is secured at one end to said hub. This arm extends below and beyond the lever 18 and heretofore was provided to enable manual release of the latch from pin 21 by moving the arm 26 upwardly. The latch would normally swing by gravity to a position engaging the pin 21 and the main purpose of the upward extension on latch 23 above the tooth 22 is to prevent the latch from swinging past the pin 21 when the latter is released from tooth 21.

All that has hereinabove been explained is the normal and conventional apparatus employed in hospitals and laboratories.

The attendant merely "sets" the device by positioning the disc in the predetermined desired relationship to the tooth 20 and then manually elevates arm 26 so that the lever arm 18 is released to permit tooth 20 to ride on the edge of disc 8. The disc 8 is rotated clockwise, and

when notch 28 in the edge of disc 8 reaches the tooth 20, the latter will move into the notch, thus closing the desired circuit through switch box 12 to actuate the desired apparatus. As the disc continues to revolve, other operations may be performed as the tooth enters succeeding notches, and at the end of twenty-four hours or at the desired point, the adjustable cut-off cam 30 secured to an annular ring 31 that is connected by spider arms 32 to washer 10 will engage tooth 20 to swing it back to the inoperative position shown in Fig. 1 in which pin 21 is again caught by tooth 22.

It is obvious that by the conventional structure, there is no way of starting the operations except by manually swinging the arm 26 upwardly, since the clock and disc 8 are continuously rotating.

The present invention includes an arm 35 that is apertured at one end for the shaft 7. This arm extends from shaft 7 across the outer face of the disc 8 and over the edge of the latter to the rear side of plate 6 where an extension 36 extends generally angularly relative to the front portion 35 of the arm in a direction opposite to the direction of rotation of the disc 8. The angulation of extension 36 relative to the part 35 of the arm is important so that the juncture between arm 35 and extension 36 thereof which juncture is at the outer edge of disc 8, will have passed the tooth 20 when the latter is in the inoperative position (Fig. 1) before the means on extension 36 acts to release the lever arm 15 and tooth 20 so that the latter may ride on the edge of disc 8.

The extension 36 has a pin 37 rigid therewith and projecting toward plate 1 (Fig. 2).

When arm 35 is secured on shaft 7 by the nut 11 it will rotate, as a unit, with the disc 8, and by loosening the nut 11, the position of the pin 37 around the disc can be adjusted.

Secured to arm 26 is an extensible arm generally designated 38, said arm having one section 39 directly secured to arm 26 by a clamping screw 40, and the extensible section 41 being telescopically held to section 39 by lips 42 on section 39 extending partially around section 41. A screw 43 adjustably holds section 41 to section 39 at the desired degree of extension. Section 39 may be slotted, as indicated, for said screw 43.

A roller 44 is carried on the outer end of the extensible section 41, which roller is held by arm 38 in the path of travel of the pin 37 when the latch arm 23 is in a position with the pin 21 held by tooth 22. This exact position of the roller is such that its axis is slightly above the path of travel of pin 37 so that said roller will be lifted when pin 37 engages it, thus swinging the latch arm 23 counterclockwise and releasing the pin 21 so that tooth 20 on the lever 15 will ride on the edge of disc 8.

Fig. 3 shows the pin 37 in a position below roller 44, and Fig. 4 shows the tooth 20 in notch 28 with the switch button 13 fully extended so that the circuit is closed. As seen in Figs. 1 and 3, the juncture between the arm 35 and its extension 36 has passed tooth 20 by the time pin 37 engages roller 44.

On the day or evening before a holiday, the operator merely sets the arm 35 so that the operations to be effected by the actuation of the switch actuating lever will automatically commence at a time when the operations will be completed during the working hours of the day following the holiday. Thus there will be no loss of time as now occurs, and no person will be required to manually commence the desired operations on the holiday.

This example is not intended to be restrictive of the use of the device, but is an example of one of its uses.

The attachment of the invention can be effected quickly by anyone without altering the conventional machine, and if the operator does not wish to use it, the arm 35 can be as quickly removed as disc 8 since the same means holds both the arm and the disc and must be removed to change the disc.

I claim:

1. An attachment for a power driven rotary time control disc and a switch actuating lever movable into and out of engagement with said disc for actuation of a switch by said lever when said lever is in engagement with said disc and which lever is releasably held by a movable element out of engagement with said disc, comprising; a first arm adapted to be secured to said disc for rotation therewith and having a member thereon movable with said arm in an annular path about the axis of said disc adjacent to a side of the latter, a second arm adapted to be secured to said element in a position for engagement of a portion thereof by said member for moving said element out of holding relation with said lever and for moving said portion to one side of said path radially of said axis, said first arm being substantially U-shaped for receiving said disc between the sides of said U with one side of said U extending to the axis of said disc and a projection on the other side of said U, said portion of said second arm being a roller adapted to engage said projection.

2. An attachment for a power driven rotary time control disc driven in one direction and a switch actuating lever movable into and out of engagement with the outer edge of said disc and a movable element for holding said lever out of said engagement until said element is moved, comprising; a generally U-shaped first arm providing a pair of spaced arm sections and a closed end joining said arm sections, one arm section of said pair extending at an angle to the other arm section in a plane separate from and parallel with the plane in which said other section is disposed, means for securing the outer end of said other arm section to said disc for rotation with the latter and with said closed end extending over the outer edge of said disc and with said one section extending generally oppositely from said closed end to the direction of rotation of said disc, a second arm, means for securing one end of said second arm to said movable element in a position with its outer end that is opposite said one end adjacent to the outer end of said one arm, means respectively on the said outer ends of said second arm and said one arm of said first arm adapted to move into engagement upon rotation of said first arm in said one direction when said first arm is secured to said dial and when said second arm is secured to said element for moving said element to release said lever arm, the angle between said arm sections being such that the said closed end joining said sections is moved past the point on the said disc engaged by said lever arm when said lever is released by engagement of said means.

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