

A. T. RACKSTRAW.
 SIGNAL ACTUATING MEANS.
 APPLICATION FILED OCT. 18, 1909.

972,245.

Patented Oct. 11, 1910.

2 SHEETS—SHEET 1.

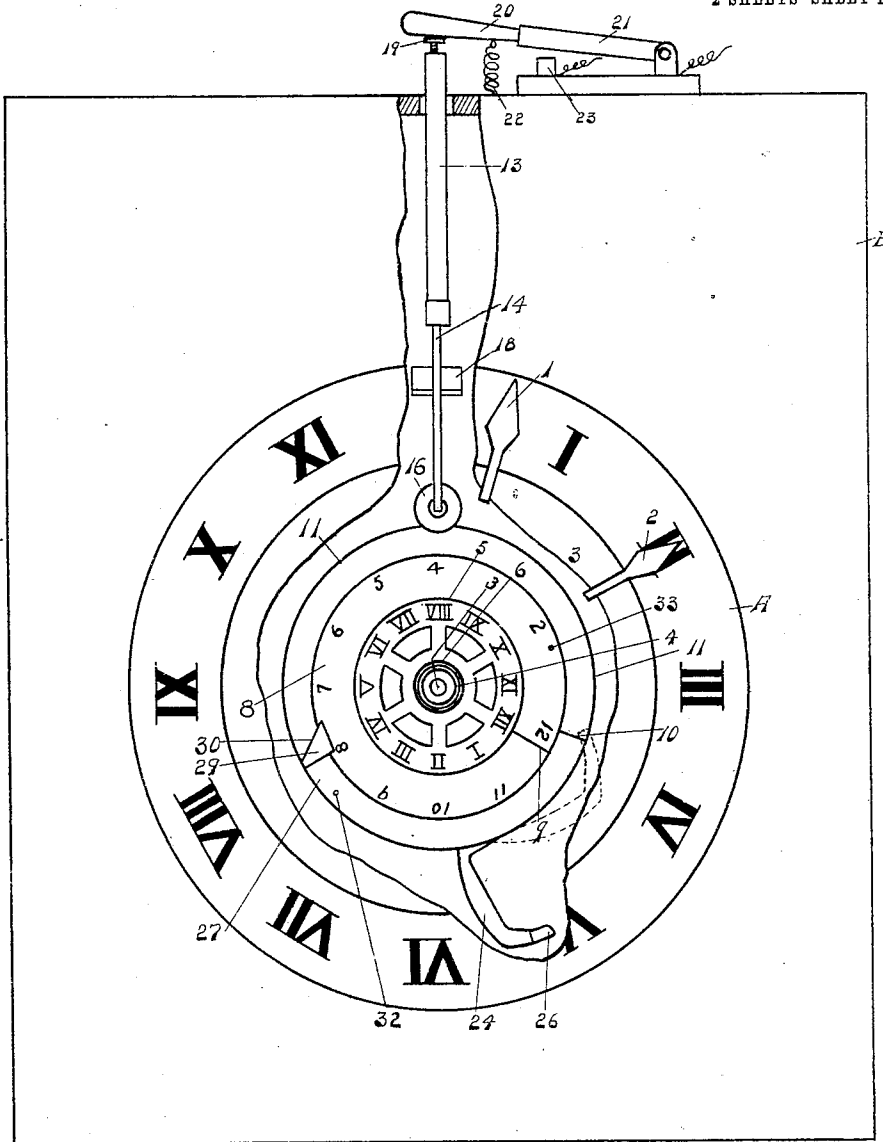


FIG. 1

WITNESSES:

Roy Wallis
Ralph S. Warfield

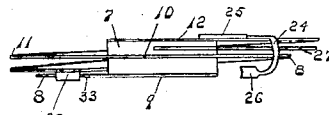


FIG. 13

INVENTOR

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BY

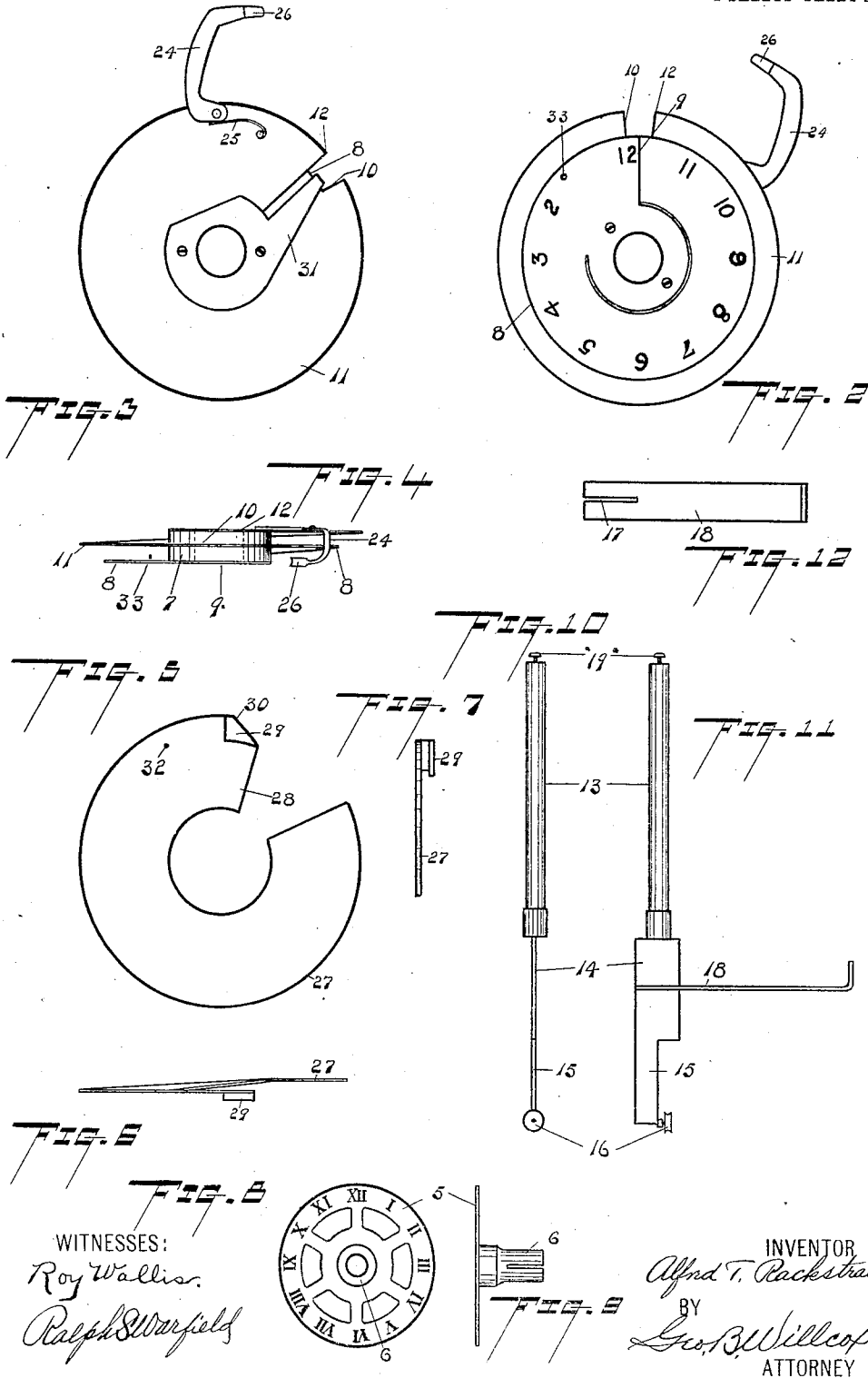
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2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

ALFRED T. RACKSTRAW, OF BAY CITY, MICHIGAN.

SIGNAL-ACTUATING MEANS.

972,245.

Specification of Letters Patent.

Patented Oct. 11, 1910.

Application filed October 18, 1909. Serial No. 523,283.

To all whom it may concern:

Be it known that I, ALFRED T. RACKSTRAW, a citizen of the United States, residing at Bay City, in the county of Bay and State of Michigan, have invented certain new and useful Improvements in Signal-Actuating Means; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to signal-actuating means and in the present instance is employed for opening and closing electric circuits, one object being the provision of novel means of this character whereby a lamp, for instance, may be automatically lighted and extinguished at certain predetermined times.

Another object is the provision of a simple, neat, and inexpensive mechanism for effecting the above result.

A still further object is the provision of hand-operated adjustable means for regulating the length of time during which the electric circuit remains closed or opened.

Still another object is the provision of novel means applicable to clocks, which make two revolutions of the dial in twenty-four hours, whereby the circuit may be kept open or closed throughout a greater length of time than twelve hours.

Another object is the provision of disk-like spirals of different radial diameters and means for causing a movable member to ride over the higher disk to the lower and vice versa, at predetermined times.

To these and other ends, therefore, my invention consists in certain novel features and combinations such as will be more fully described hereinafter and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a front view of a clock and its casing broken away to better disclose the invention, Fig. 2 is a detail front view of the switch-controlling mechanism, Fig. 3 is a rear view thereof, Fig. 4 is an edge view thereof, Figs. 5 and 6 are front and edge views respectively of the means for regulating the length of time during which the switch circuit shall remain open or closed, Fig. 7 is a fragmentary detail showing the combined shoe and incline carried by the regulator, Figs. 8 and 9 are front and edge views respectively, of the setting dial, Figs. 10 and 11 are front and side views respectively, of the standard

actuated by the controller to effect the opening and closing of an electric circuit, for instance, Fig. 12 is a detail top plan view of the bracket in which the switch-operating standard is received, and Fig. 13 is a detail edge view of the controller showing the adjustable regulator applied thereto.

My invention consists broadly in the provision of disk-like members of two diameters, adapted to receive a trolley carried by a longitudinally movable standard for actuating a signal, closing and opening an electric circuit. With the disks are associated means for transferring the trolley from one disk to the other at predetermined times. A slightly more restricted view of the invention includes the addition of adjustable means whereby the trolley is transferred from one disk to the other at predetermined times to effect any desired result.

In the drawings I have shown the invention as adapted to open and close an electric circuit but it is obvious that it might be otherwise employed. Also, in the drawings and hereinafter, I have shown and have described the invention as adapted to maintain the circuit open throughout a major portion of the twenty-four hours of the day, it being perfectly obvious that by a suitable construction of switch and standard, the circuit might be retained closed throughout the major portion of the twenty-four hours.

My invention is particularly useful in jewelry stores, banks, and other places where it is desired to automatically retain a light for display purposes or for illumination during the night, or any portion thereof.

The invention is also applicable to close an electric circuit whereby an intermittent signal may be given to attract the attention of purchasers.

Referring to the drawings, A indicates any ordinary clock face to which my invention may be applied, the clock being provided with the minute hand 1 and the hour hand 2 in the usual manner. The minute hand is secured to the usual shaft 3, while the hour hand is mounted on an arbor 4 in the customary manner. As is obvious, the minute hand will make one complete rotation relative to the clock face every hour, the hour hand making one complete rotation of the clock face every twelve hours.

The clock mechanism is received in any convenient casing B, as shown in Fig. 1.

My invention is capable of attachment to

any clock, it being unnecessary to construct a special clock for the controller.

Referring more particularly to the construction, I provide a dial 5, on which the 5 hours are marked from 1 to 12. This dial is rigidly mounted upon a hollow split shaft 6, which is rotatively adjustable upon the arbor 4 of the hour hand. The split shaft will frictionally engage the arbor but will permit 10 the dial 5 to be removed and replaced, as well as rotated on the arbor, the resilience of the hollow shaft operating to maintain the dial 5 in adjusted position on the arbor. This hollow shaft is provided with a hub 7 15 which may either be fast on the shaft or removably secured thereto, such hub having mounted thereon in the present instance, a spiral formed on two diameters. The smaller spiral 8, when viewed from in front, as 20 shown in Figs. 1 and 2, forms a complete circle, the outer edge of the spiral being indicated by the line 9, behind which the tail or rear end of the smaller spiral is concealed, such tail or rear end being provided 25 with a shoulder 10 which indicates the commencement of the large spiral 11. The large spiral terminates at 12, the shoulder 10 and end 12 being spaced apart from each other so that the larger spiral by itself, does 30 not quite form a complete circle. This, however, is not essential since the tail or rear end 12 of the larger spiral 11 might be extended to pass or overlap the shoulder 10.

From the foregoing it is seen that I have 35 provided in effect, two disks 8 and 11, the former being of less diameter than the latter, and I preferably arrange the Arabic numerals from 2 to 12 counter-clock-wise around the smaller disk or spiral 8 for a 40 purpose hereinafter set forth, such Arabic numerals differing from the Roman numerals on the dial 5.

In the particular form shown in the drawings, I provide a standard 13, the lower end 45 of which is preferably rectangular in shape, as shown at 14, and is recessed or cut away as at 15, a grooved trolley wheel 16 being mounted in the recess and adapted to ride on the edges of the disks 8 and 11 respectively. The thin rectangular portion 14 of 50 the standard is received in a slot 17 in a bracket 18 carried by the clock casing B or otherwise supported and is free to move in a direction normal to the clock face. The upper end of the standard is provided with 55 an adjusting screw 19, which in the present embodiment of my invention, is adapted to engage the handle 20 of a knife-switch 21 to raise the latter against the tension of a 60 spring 22 and break an electric circuit, not shown. The normal tendency of the spring 22 is to draw the knife-switch into engagement with the contacts 23 and make or close the circuit.

It will readily be seen that the continued

engagement of the trolley 16 with the large disk or spiral 11 will maintain the circuit open or broken, whereas the continued engagement of the trolley 16 with the smaller disk 8 will permit the spring 22 to maintain 70 the electric circuit closed. It, therefore, is necessary to provide some means whereby the trolley 16 may be transferred from the larger disk 11 to the smaller disk 8 at some predetermined time and thereafter transferred 75 from the smaller disk back onto the larger disk, and as one means for effecting this end, I provide the large disk with what I may term a bridge 24, normally held in the position shown in Figs. 1, 2 and 3, by 80 means of the leaf spring 25 engaging the squared end of the bridge 24 adjacent its pivotal support. The bridge is arch-shaped in general construction and is bent laterally so as to span the space between the rear end 85 12 of the large spiral and the forward end 9 of the smaller spiral or disk. The free end of the bridge is bifurcated, as shown at 26, to embrace the edge of the disk 8. The standard is recessed at 15, with the trolley 90 wheel 16 set in the recess in order to avoid engagement with the bridge as the controller rotates.

The Roman numerals on the dial 5 are 95 arranged clock-wise, while the Arabic numerals on the smaller disk 8 are arranged counter-clock-wise, the different sets of numerals being employed to avoid confusion as will be apparent hereinafter, and the Roman numeral 12 on the dial is arranged 100 in radial alinement with the Arabic numeral 12 on the small disk 8.

The Arabic numeral 12 is preferably located at the outer end of the spiral 8, adjacent the shoulder 9, as shown in Figs. 1 and 105 2, and when the rotation of the hour hand arbor 4 has brought the Roman numeral 12 and its alined Arabic numeral 12 into radial alinement with the clock face numeral 12, the trolley, which will have previously ridden 110 upon the bridge 24, will descend or be transferred over onto the smaller disk 8. This movement of the trolley operates to lower the standard, thereby removing its upper end from engagement with the handle 115 20 of the switch 21 to permit the spring 22 to close the switch. It is also necessary to provide some means for returning the trolley to the larger disk 11, whereby to raise the standard to cause its upper end to 120 engage and move the handle of the switch 21 to break the circuit, and as one such means for effecting this result, I may make the shoulder 10 inclined so that when, owing to the rotation of the controller, the trolley 125 has either partially or wholly completed one circuit of the smaller disk, it will ride up such incline onto the large disk 11. In this manner it will be observed that I have produced an attachment for clocks whereby, at 130

a predetermined time, the switch would be closed and at a later time, the switch would be opened. It is obvious, however, that through certain seasons of the year there is more than twelve hours of day light, during which it would not be necessary to maintain a display or protection light, for instance. It is also true that during other seasons of the year and especially in foggy or cloudy weather, it might be necessary to maintain a light or signal for a period of twelve hours. It, therefore, is advisable to provide an adjustable regulating means whereby the electric circuit, for instance, or other device to be operated, can be closed at any time desired and the attachment so arranged that it will open the circuit at any future time desired within twelve hours (it being understood that the terms "open" and "close" when used relative to the circuit are interchangeable as heretofore explained). As one such means I have provided the spiral disk 27 shown in Figs. 5, 6 and 7, which is intermeshed with the spirals 8 and 11, the regulator spiral 27 being split as shown at 28, to permit it to be received upon the hub 7 whereon it is rotated. One end of the regulator spiral is provided with a laterally extending grooved shoe 29, the outer face of which is inclined as at 30. This grooved shoe is adapted to take over and travel upon the smaller spiral 8, the tail of the regulator spiral extending behind the shoulder 10 of the large spiral 11. The regulator spiral is of the same diameter as the large spiral disk 11 and hence it will be seen that the adjustment of the regulator spiral around the periphery of the small spiral 8 will operate as an extension of the shoulder 10 or forward end of the large spiral 11, to build out the smaller spiral 8 and thereby curtail the length of time during which the trolley 16 will ride on the small spiral 8. The regulator spiral 27 is loosely mounted on the hub 7, in order to permit its adjustment relative to the smaller disk 8, such adjustment being maintained by the engagement of the spring 31 secured to the rear face of the large spiral 11, as shown in Fig. 3, the free end of the spring finger 31 bearing upon the rear face of the regulator spiral 27 to hold it in frictional contact with the large spiral disk 11. The adjustment of the regulator spiral is limited by the pin 32 carried adjacent the forward end of the regulator and adapted to engage the shoulder 10 of the large disk and by the pin 33 carried by the small disk 8 adjacent the numeral 2 thereon and adapted to be engaged by the grooved shoe 29 on the controller.

The attachment and operation of this embodiment of my invention is as follows:

The trolley controller disks mounted on the hub 7 which in turn is mounted on the split shaft or spindle 6 of the disk 5, are

attachable to the hour hand arbor 4 of any clock. Preferably the center of the clock face A is cut out to accommodate the attachment and afford access thereto for adjustment or regulation, the hollow shaft or spindle 6 being forced over the arbor 4, after which the hands 1 and 2 are replaced on the shaft and arbor respectively. The trolley is then placed on the larger disk 11 (provided it is desired to maintain the switch open), the standard being held vertically by the bracket 18, the upper end of the standard passing loosely through the clock case B and engaging a switch or other device to be operated. It will be remembered that the hour hand makes two revolutions during the twenty-four hours. In the form of controller herein shown, it is possible to maintain an electric circuit closed for any period between two and twelve hours respectively. It is, therefore, possible to maintain the switch open for periods varying from twelve to twenty-two hours. In order to set the attachment so that the spring 22 will maintain the switch closed for a period of say eight hours, the regulator spiral 27 is rotated on the hub 7 until the inclined shoe 29 lies in alinement or registers with the Arabic numeral 8 on the smaller disk 8, as shown in Fig. 1. It will thus be seen that the regulator spiral has practically been adjusted to form a continuation of the rearward larger spiral disk 11 to form an arc substantially concentric with the periphery of the small disk 8, such arc extending from the shoulder 10 to the inclined shoe 29 and operating to curtail the length of travel of the trolley 16 on the periphery of the small disk 8 and thereby shorten the time during which the switch will remain closed. In order to determine at what time the trolley shall be transferred from the large disk 11 to the smaller disk 8, I will assume that a merchant wishes to close his store at 10 o'clock and to maintain a light burning in his show window, in front of his safe or elsewhere for a period of eight hours or until 6 o'clock, at which time he will either return to the store or there will be sufficient day light to render artificial lighting unnecessary. With the regulator spiral set as above described, the merchant will rotate the entire attachment, including the disks 8 and 11, the hub 7, the dial 5, and its split shaft 6 relative to the hour hand arbor 4 until the Roman numeral 10 is covered by the hour hand 2, no matter where such hour hand may be at the time. In the present instance the hour hand 2 points to 2 o'clock and the Roman numeral 10 on the dial is overlapped by such hour hand. The trolley wheel 16 is in engagement with the large disk 11 to retain the switch open, it being, I will assume, 2 o'clock in the afternoon, when a light is not desired. As the hour hand

arbor rotates relative to the clock face, it
 will rotate the disks 8 and 13 and the dial 5
 and as the hour hand approaches the hour of
 10, the trolley wheel 16 which has been
 5 in engagement with the spiral disk 11 and
 is being fed rearwardly to a slight extent
 by the space between the convolutions of the
 spirals, will engage the bridge 24 and force
 the latter downward into the dotted line po-
 10 sition shown in Fig. 1 against the tension
 of the spring 25. The trolley wheel 16 will
 ride up on such bridge and when it is 10
 o'clock, the Roman numeral 12 on the dial,
 the Arabic numeral 12 on the small disk 8,
 15 and the numeral 12 on the clock face will lie
 in alinement, in which position the trolley
 wheel will ride down the free end of the
 bridge onto the smaller disk 8 and thereby
 permit the spring 22 to close the switch 21.
 20 In this manner is the trolley transferred
 from the rear end of the large spiral 11 to
 the forward end of the smaller spiral 8. The
 continued rotation of the hour hand arbor
 will bring the inclined face 30 of the shoe
 25 29 into engagement with the trolley wheel
 16, eight hours from the time when the trol-
 ley wheel was transferred from the large
 disk 11 to the small disk 8, to accomplish
 the retransfer of the trolley wheel to the
 30 large spiral which retransfer will take place
 at 6 o'clock, thereby automatically breaking
 the electric circuit by raising the trolley
 wheel 16 onto the regulating spiral 27 which
 constitutes an adjustable continuation of the
 35 forward end of the large spiral 11.

The slot 17 in the bracket 18 is of suffi-
 cient length to permit the trolley standard
 to have a slight lateral movement as it fol-
 lows the convolutions of the large and small
 40 spiral disks 8 and 11.

It is obvious from the foregoing that a
 certain condition may be sustained for any
 length of time between two and twelve hours
 respectively. The rectilinear motion of the
 45 standard may be employed for effecting a
 variety of results and need not necessarily
 be confined to the operation of the switch.

It is also obvious that changes might be
 made in the form and arrangement of the
 50 several parts described, without departing
 from the spirit and scope of my invention.

Having thus fully disclosed my invention,
 what I claim as new, is:—

1. The combination with a movable mem-
 55 ber, of a plurality of concentric disks of
 different diameters, means for rotating the
 disks, the movable member adapted to en-
 gage the peripheries of the disks, and means
 for transferring and re-transferring that
 60 end of the movable member which engages
 the disks, from one disk to the other.

2. The combination with a movable mem-
 ber, of rotatable, concentric, clock-actuated
 disks of different diameters, one end of the
 65 movable member adapted to engage the re-

spective disks successively, means for trans-
 ferring and retransferring that end of the
 movable member which engages the disks,
 from one disk to the other, both disks being
 adapted to be adjusted simultaneously to
 70 vary the time of transfer.

3. The combination with a movable mem-
 ber, of a clock, a rotatable spiral, the convo-
 lution at one end of which is reduced in di-
 ameter, the member adapted to engage the
 75 spiral, means for transferring the point of
 engagement of the member from that por-
 tion of the spiral having the larger diameter
 onto the reduced convolution, and adjustable
 means for returning the point of engage-
 80 ment of the movable member to the unre-
 duced portion of the spiral.

4. The combination with a movable mem-
 ber, of a plurality of concentric disks, clock-
 controlled means for rotating the disks, one
 85 of the disks being of greater diameter than
 the other, one end of the movable member
 adapted to engage the disks, means for
 transferring the end of the movable member
 from the larger disk to the smaller disk,
 90 and adjustable means for transferring the
 end of such member onto the larger disk.

5. The combination with a movable mem-
 ber, of a plurality of concentric disks, clock-
 controlled means for rotating the disks, one
 95 of the disks being of greater diameter than
 the other, one end of the movable member
 adapted to engage the disks, means for
 transferring the end of the movable member
 from the larger disk to the smaller disk,
 100 adjustable means for transferring the end
 of such member onto the larger disk, and
 means for releasably retaining the re-trans-
 ferring means in adjusted position.

6. The combination with a clock-con-
 105 trolled drive mechanism, of a rotatable
 spiral actuated by the drive mechanism, one
 of the convolutions of the spiral being re-
 duced and provided with a gage and a dial,
 adjustable means constituting an extension
 110 of the unreduced portion of the spiral for
 building out the reduced convolution to in-
 crease its diameter to that of the unreduced
 portion, the free end of such adjustable
 means merging into the plane of the reduced
 115 convolution, a movable member, one end of
 which is engaged by the spiral, and means
 for transferring the end of such movable
 member from the unreduced portion onto
 the reduced convolution of the spiral.
 120

7. The combination with a clock-actuated
 drive mechanism, of a rotatable spiral ac-
 tuated by the drive mechanism, one of the
 convolutions of the spiral being reduced, ad-
 justable means constituting an extension of
 125 the unreduced portion of the spiral, for
 building out the reduced convolution to in-
 crease its diameter to that of the unreduced
 portion, the free end of such adjustable
 means merging into the plane of the reduced
 130

convolution, a movable member, one end of which is engaged by the spiral, means for transferring the end of such movable member from the unreduced portion onto the reduced convolution of the spiral, and a spring finger frictionally engaging the adjustable means for releasably retaining it in adjusted position.

8. The combination with a clock-controlled source of power, of a rotatable spiral, one convolution of which is reduced, the spiral being driven from the source of power, a disk regulator adjustable relative to the reduced convolution, and of substantially the same diameter as the unreduced portion of the spiral to build out the reduced convolution, a member adapted to ride the spiral, means for transferring the riding member from the unreduced portion of the spiral to the reduced convolution, the regulator constituting an extension of the unreduced portion of the spiral, the free end of the regulator merging into the periphery of the reduced convolution, and means for normally retaining the transferring means in inoperative position.

9. In a device of the character described, a clock, a rotatable hub, a spiral mounted thereon, one convolution of which is reduced, a movable member, one end of which is adapted to ride on the spiral, a disk regulator of a diameter substantially equal to that of the unreduced portion of the spiral and constituting an extension thereof, the disk meshing with the spiral and having a central opening communicating with a segmental space to receive the hub, the disk being adjustable on the hub relative to the reduced convolution to build out the latter to the diameter of the unreduced portion of the spiral, the outer end of the disk merging into the reduced convolution, and means for transferring the end of the movable member from the unreduced onto the reduced portion of the spiral across the regulator disk.

10. In a device of the character described, the combination with a clock, of a movable member, of a rotatable spiral, one convolution of which is reduced, one end of the movable member being adapted to engage the spiral and follow its convolutions, and means for transferring the end of the movable member from one portion of the spiral to another.

11. In a device of the character described, the combination with a clock, of a movable member, a rotatable spiral, one convolution of which is reduced, one end of the movable member being adapted to engage the spiral and follow its convolutions, and a bridge pivoted to the unreduced portion of the spiral, one end of the bridge adapted to engage the reduced convolution, the movable member adapted to engage and ride onto the bridge.

12. In a device of the character described, the combination with a clock, of a movable member, a rotatable spiral, one convolution of which is reduced, one end of the movable member being adapted to engage the spiral and follow its convolutions, and a bridge pivoted to the unreduced portion of the spiral, one end of the bridge adapted to engage the reduced convolution, the movable member adapted to engage and ride onto the bridge, and means for normally retaining the bridge out of engagement with the reduced convolution.

13. In a device of the character described, the combination with a clock, of a movable member, a rotatable spiral, one convolution of which is reduced, one end of the movable member being adapted to engage the spiral and follow its convolutions, and an arched bridge pivoted to the unreduced portion of the spiral, the bridge being bent laterally to span the unreduced portion of the spiral, the free end of the bridge adapted to engage the reduced convolution.

14. In a device of the character described, the combination with a clock, of a movable member, a rotatable spiral, one convolution of which is reduced, one end of the movable member being adapted to engage the spiral and follow its convolutions, and a bridge pivoted to the unreduced portion of the spiral, one end of the bridge being bifurcated and adapted to engage the reduced convolution, the movable member adapted to engage and ride onto the bridge.

15. In a device of the character described, the combination with a clock, of a movable member, a rotatable spiral, one convolution of which is reduced, one end of the movable member being adapted to engage the spiral and follow its convolutions, and means for transferring the end of the movable member from the unreduced to the reduced portion of the spiral, a disk regulator constituting an extension of the forward end of the unreduced portion of the spiral and adjustable relative to the reduced convolution, and a grooved inclined shoe on that end of the disk engaging the reduced convolution.

16. In a device of the character described, the combination with a clock, of a movable member, a rotatable spiral, one convolution of which is reduced to form a disk of less diameter than the remaining portion of the spiral, a shoulder at the juncture of the reduced with the unreduced portion of the spiral, one end of the movable member adapted to engage and follow the spiral, means for transferring the end of the movable member from the unreduced to the reduced convolution of the spiral, a disk meshing with the spiral and constituting an extension of the unreduced portion thereof, the free end of the regulator disk merging into

and adjustable on the reduced convolution and stops carried by the regulator disk and by the reduced convolution to limit the movement of the regulator disk relative to the reduced convolution.

17. The combination with a clock mechanism provided with a clock face and an hour hand arbor, of an attachment removably received upon and rotatably adjustable relative to the arbor, the attachment comprising disks of varying diameters, a movable member, one end of which rides on the disks, and means for transferring the end of the movable member from one disk to another.

18. The combination with a clock mechanism provided with a clock face and an hour hand arbor, of an attachment removably received upon and rotatably adjustable relative to the arbor, the attachment comprising disks of varying diameters, a movable member, one end of which rides on the disks, a regulator adjustable relative to the disk of small diameter to curtail the periphery of such small disk and for transferring the end of the movable member onto the larger disk, and means for re-transferring the end of the movable member onto the smaller disk.

19. The combination with a clock mechanism provided with a clock face and an hour hand arbor, of an attachment removably received upon and rotatably adjustable relative to the arbor, the attachment comprising disks of varying diameters, a movable member, one end of which rides on the disks, figures on the smaller disk extending counter-clock-wise thereof, a second set of numerals arranged clock-wise of the disk, the highest numeral on the second set of numerals lying in radial alinement with the highest numeral of the first-named series, a

predetermined numeral of the second set adapted to be brought into radial alinement with a similar numeral on the clock face, means for transferring the end of the movable member from one disk to the other when the hour hand reaches the hour at which the smaller disk is set, and a regulator adjustable relative to the first set of figures for determining the length of time during which the end of the movable member shall travel on the smaller disk.

20. The combination with a clock having an hour hand arbor, of a shaft removably received and rotatably adjustable on the arbor, a spiral mounted on the shaft, one convolution of the spiral being reduced in diameter and constituting a circular disk, a movable member, one end of which engages the spiral, means for transferring the end of the movable member from one portion of the spiral to another.

21. The combination with a clock having an hour hand arbor, of a shaft removably received and rotatably adjustable on the arbor, a spiral mounted on the shaft, one convolution of the spiral being reduced in diameter and constituting a circular disk, a movable member, one end of which engages the spiral, means for transferring the end of the movable member from the unreduced to the reduced portion of the spiral and adjustable means for returning the end of the movable member to the unreduced portion of the spiral.

In testimony whereof, I affix my signature in presence of two witnesses.

ALFRED T. RACKSTRAW.

Witnesses:

O. C. MANN,

JOHN W. INGERSOLL.