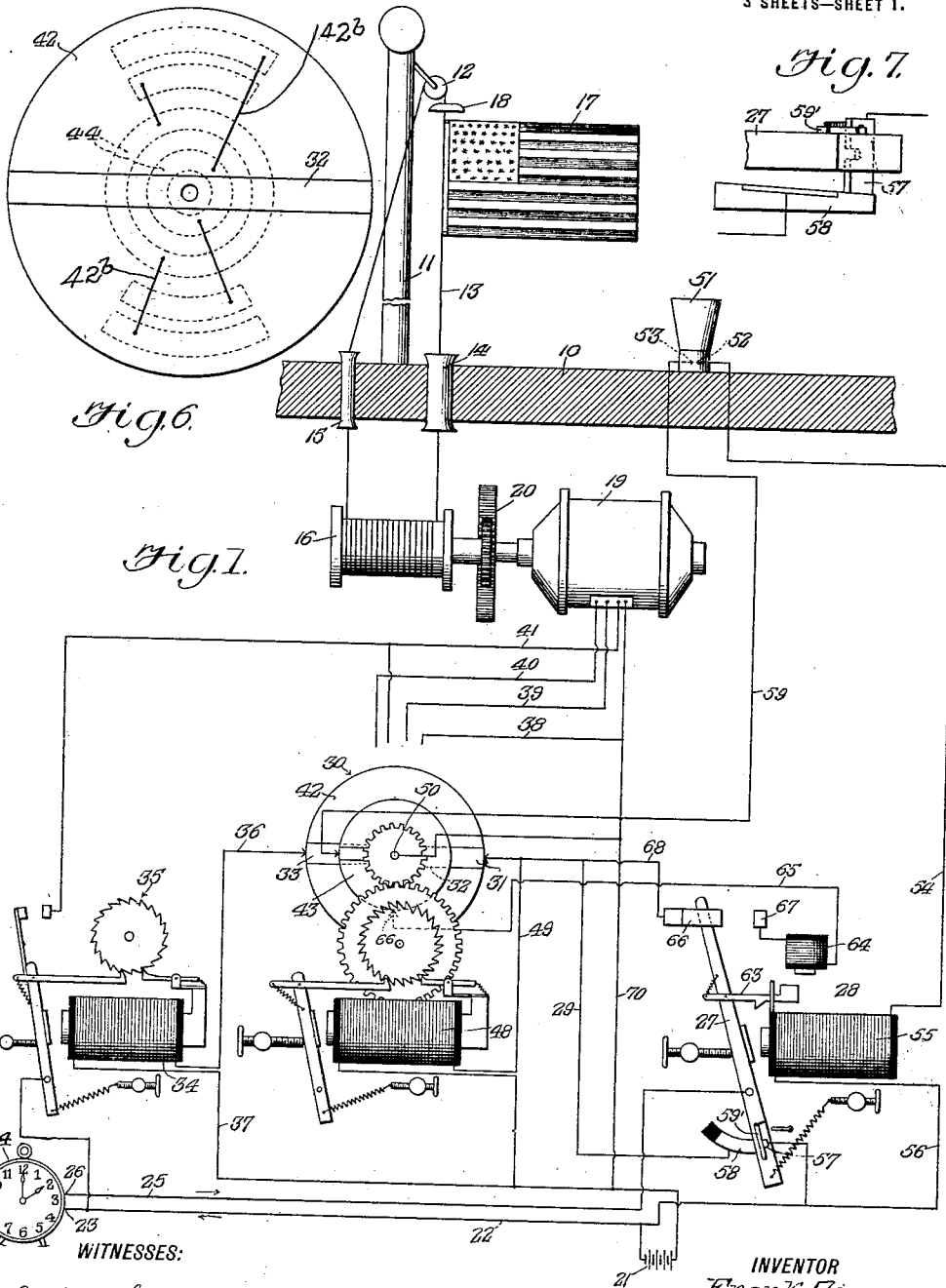


F. ZIPOY.
AUTOMATIC FLAG RAISING AND LOWERING DEVICE.
APPLICATION FILED MAR. 8, 1919.

1,373,376.

Patented Mar. 29, 1921.
3 SHEETS—SHEET 1.



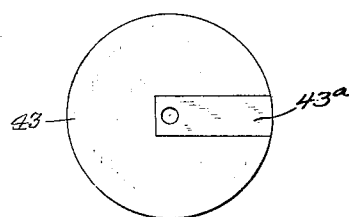
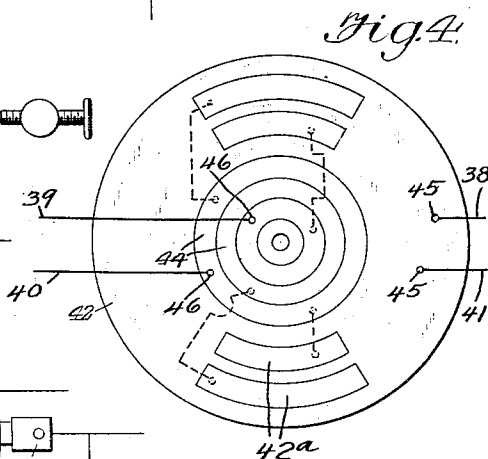
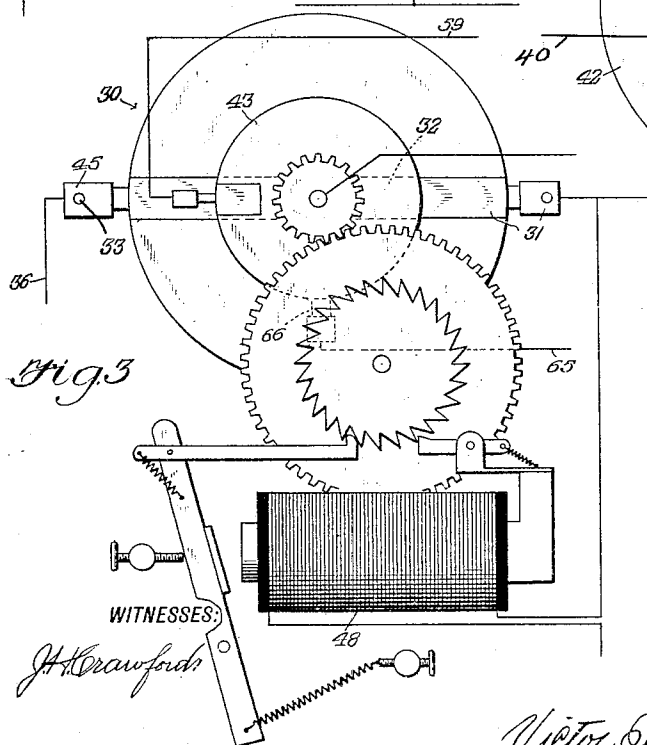
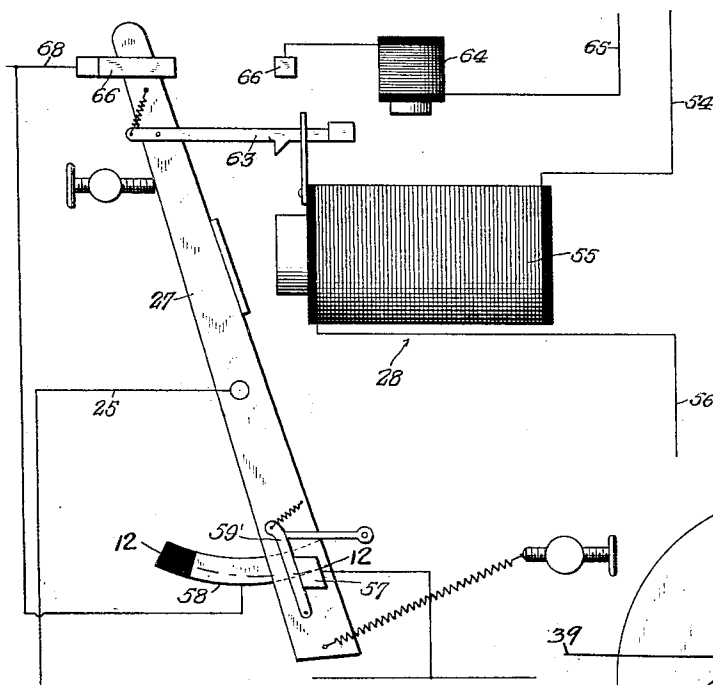
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APPLICATION FILED MAR. 8, 1919.

3 SHEETS—SHEET 2.



BY *me* ATTORNEY

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 3 SHEETS—SHEET 3.

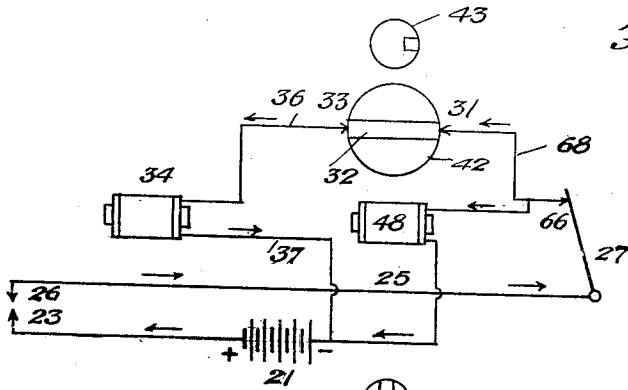


Fig. 8.

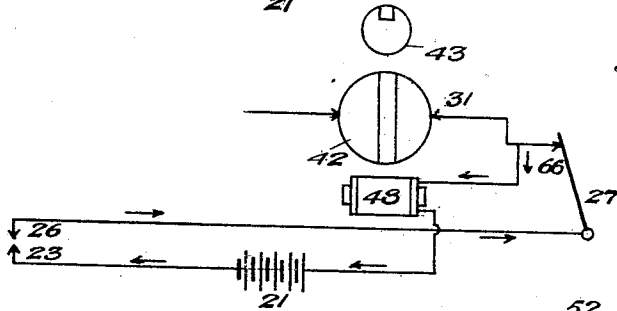


Fig. 9.

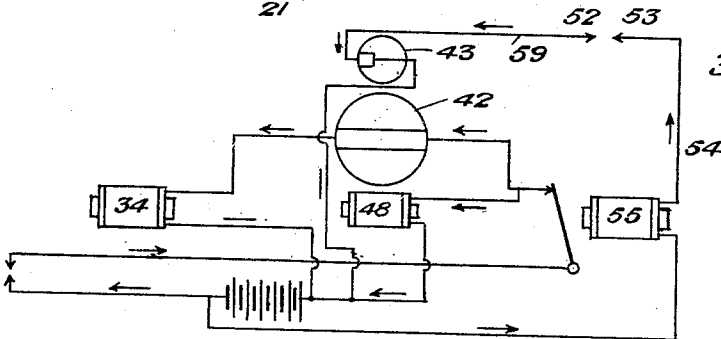


Fig. 10.

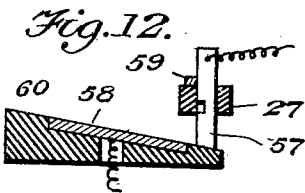


Fig. 12.

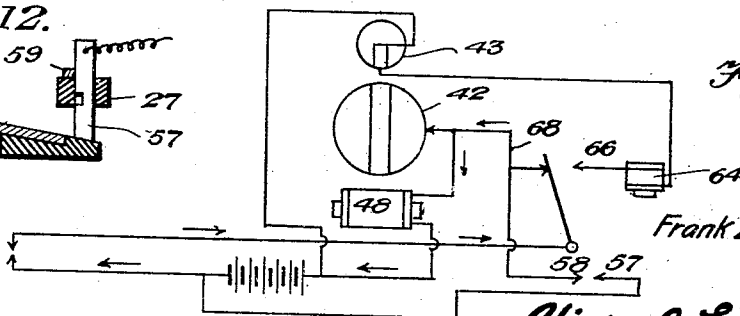


Fig. 11.

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UNITED STATES PATENT OFFICE.

FRANK ZIPOY, OF MINNEAPOLIS, MINNESOTA.

AUTOMATIC FLAG RAISING AND LOWERING DEVICE.

1,373,376.

Specification of Letters Patent.

Patented Mar. 29, 1921.

Application filed March 8, 1919. Serial No. 281,565.

To all whom it may concern:

Be it known that I, FRANK ZIPOY, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented new and useful Improvements in Automatic Flag Raising and Lowering Devices, of which the following is a specification.

This invention relates to means for automatically raising or lowering a flag at predetermined times, so that the services of an attendant will not be required for that purpose and the danger of leaving the flag in raised position after dark avoided.

Another object is to provide means for automatically lowering the flag in inclement weather so that the life of the flag will be prolonged and the latter will retain its fresh appearance in color for an indefinite period.

With the above and other objects in view, the invention includes a time switch or clock mechanism, which is included in the circuit in which is also included a reversing switch and a time limit relay, the latter closing the same so as to operate a motor, which in turn operates the flag raising mechanism.

One of the novel features of the invention resides in the means for automatically closing the motor circuit in the event of rain or snow, so that the flag will be lowered and protected against becoming wet. Other novel features of the invention will appear from the following description when read in connection with the accompanying drawings:—

In the drawings:—

Figure 1 is a diagrammatic view illustrating the application of the invention.

Fig. 2 is an enlarged view of the disconnecting relay and

Fig. 3 is a detail of the reversing switch.

Fig. 4 is a detailed front view of the large disk of the reversing switch.

Fig. 5 is a similar view of the small disk.

Fig. 6 is a plan view of the disks shown in Fig. 4, looking at the opposite side of said disks. Fig. 7 is a fragmentary edge view of the contact segments and the end of the armature of the disk connecting relay.

Fig. 8 is a diagrammatic view of the reversing switch circuit showing the switch in position just prior to raising the flag.

Fig. 9 is a view of the circuits just after the flag has been raised.

Fig. 10 shows a diagrammatic view of the

circuits five minutes after the raising of the flag.

Fig. 11 is a view of the circuits immediately after the flag has been lowered.

Fig. 12 is an enlarged sectional view through the brush locking mechanism.

Referring in detail to the drawings, the invention is shown as housed beneath the roof of a building, this roof being indicated at 10. Mounted upon the roof is a flag pole 11, which supports at its top a pulley 12.

The flag halyard 13 passes around the pulley and through tubular guides 14 and 15 arranged transversely to the roof where it is wound upon a drum 16. The flag 17 is secured to the halyard and secured to halyard immediately above the flag is a covering 18 which is adapted to close the top of the tubular guide 14 when the flag is lowered and to prevent the entrance of rain or moisture therein.

The drum 16 is adapted to be automatically operated to raise or lower the flag and for this purpose there is provided an electric motor 19, which is connected to the drum through the medium of suitable reducing gearing 20.

The motor is operated from a suitable source of power herein shown as a battery 21 and one terminal of this battery is connected through the medium of a conductor 22 with one terminal 23 of a clock 24, the hands of which are adapted to operate to close the circuit. The current passes through the clock and through a conductor 25 connected to the other clock terminals 26 and thence to the armature 27 of a disconnecting relay, which is designated in its entirety by the numeral 28. The current then passes through a conductor 29 to a reversing switch 30, the conductor 29 being connected to a contact 31 upon one side of the switch, wherein it passes through a bus bar 32 to the opposite contact 33. The contact 33 is connected to a magnet 34 of a time limit relay 35, through the medium of a conductor 36 and this magnet is connected by means of a conductor 37 to the other side of the battery 21. The current flowing in the above described manner will operate the reversing switch and the time limit relay and when in the position of Fig. 1 the switch which is connected to the motor 19 through the conductors 38, 39, 40 and 41 will operate said motor to rotate the drum in a direction to raise the flag.

Should the clock 24 be set to operate to raise the flag at 8 a. m. at 8:05 the clock will close the contacts so as to operate the reversing switch and place the latter in a position to operate the motor in a reverse direction to lower the same at a predetermined time in the evening, as for example 5 p. m. at which time, the motor will be operated in a reverse direction upon the closing of the clock contacts and the flag will be lowered.

The reversing switch 30 includes fiber disks 42 and 43, the latter being of smaller diameter than the former. The disk 42 is formed of four segments and is provided with two slip rings 44, and with two brushes 45, which ride upon the segments. Additional brushes 46 ride on the slip ring so as to furnish the current through the armature. The reversing switch 30 is operated by a magnet 48, which is connected to a conductor 49 bridged across the conductors 36 and 37, this magnet operating a shaft 50 upon which the disks 42 and 43 are mounted. The brushes 45 are located at the ends of the conductors 38 and 41, while the brushes 46 are located at the ends of the conductors 39 and 40, the latter as stated engaging the slit ring 44 while the former alternately engage the segments of the disk 42, the said segments being indicated at 42^a. The segments and slit rings are connected by wires 42^b as shown in Fig. 6 of the drawings and when the disk 42 is rotated approximately 180 degrees, the poles of the motor will be reversed and consequently its direction of rotation reversed. The disk 43 which carries a contact 43^a is operated simultaneously with the disk 42 and its contact is always disposed longitudinally of the bus bar 32.

In order to lower the flag in the event of rain or snow, there is provided a receptacle 51, which is open at the top and mounted upon the roof end. In the bottom of this receptacle is a pair of contacts 52 and 53, slightly spaced apart and adapted to be bridged by the collection of moisture within the receptacle 51. Owing to the collection of dust or other extraneous matter within the receptacle 51, the moisture collected therein will become a conductor for the passage of current between the contacts 52 and 53. The contact 52 is connected through the medium of the conductor 54 with a magnet 55 of the disconnecting relay 28. This magnet is connected by means of a conductor 56, with a brush 57 mounted upon the end of the armature 27. The brush 57 operates over a segmental contact plate 58, to which the contact 31 is connected.

When the magnet 55 is energized through completion of the circuit by the moisture bridging the space between the contacts 52 and 53, current will flow from the battery

21, through the conductor 56, the magnet 55, the conductor 54, the contacts 52 and 53, the conductor 59, the brush and brush bar of the reversing switch 30 to the shaft 50 and through the conductor 70 back to the other side of the battery. The magnet when thus energized will attract the armature 27 and the brush 57 will be moved along the segmental contacts 58 to close the clock circuit and operate the reversing switch relay 30 and the time limit relay 35 thereby causing the motor to operate to lower the flag. When the brush 57 has reached the top of the insulated portion of the segmental contact plate 58, the brush is locked by the lever 59', which slips into a slot in the brush 57, so that the latter will not ride upon the segmental contact plate 58 upon the return movement of the armature, thus preventing closing the circuit and further operation of the reversing switch. The brush 57 is connected to the conductor 56 and the segment 58 is connected to the conductor 29. The brush 57 and the segment 58 act to close the same circuit in which 23 and 26 are included. The segment 58 is connected to the conductor 29 and when the clock contacts are closed the current will pass through the conductor 29 without passing through the armature 27.

When in its attracted position, the armature 27 will be locked through the medium of a latch 63 which is operated to release said armature through a magnet 64, hence this magnet is connected through the medium of a conductor 65, with a contact 66, through which current passes into the switch 30 to the small disk 43 and through the bus bar back to the battery 21.

Assuming the reversing switch to be in the position shown in Fig. 8, when the contacts 23 and 26 of the clock are closed, current will flow from the battery 21, through the conductor 22 to the contacts 23 and 26, the conductor 25, the armature 27 to contact 66 of the disk connecting relay: then through conductor 68 and magnet 48 and back through the battery. The current also passes from conductor 68 through the contact 31 and through the bus bar 32 which is insulated from the shaft, contact 33, through conductor 36 to magnet 43 and through conductor 37 to the battery. The current flowing in this manner will operate the reversing switch and the time limit relay which latter will be moved to the position shown in Fig. 9 and this is the position of the reversing switch after the flag has been raised. Five minutes after the raising of the flag, the clock 24 will again close the circuit through the contacts 23 and 26 and current will flow from the battery through these contacts in the manner just described. Should the contacts 52 and 53 be closed by

moisture while the flag is in raised position, current will flow from the battery through the conductor 56, the magnet 55, the conductor 54 through the contacts 52 and 53 to the contact of the disk 43 and from this disk back to the battery as indicated by the arrows. The diagram shown in Fig. 11 illustrates by the arrows the direction of flow of the current just after the flag has been lowered.

The invention is susceptible of various changes in its form, proportions and minor details of construction and the right is herein reserved to make such changes as properly fall within the scope of the appended claims.

I claim:—

1. A flag raising and lowering mechanism embodying a drum having a flag halyard wound thereon in opposite directions, an electric motor connected to the drum for rotating the latter, a reversing switch included in the motor circuit for controlling the operation of said motor and the direction of movement of the flag halyard and a time controlled switch also included in the motor circuit for limiting the direction of rotation of the motor at each operation.

2. A flag raising and lowering mechanism embodying a drum having a flag halyard wound thereon in opposite directions and a flag secured to the halyard, an electric motor connected to the drum for rotating the latter, time controlled means for closing the circuit of the motor to raise and lower the flag at predetermined intervals and a reversing switch included in the motor circuit and automatically operated to re-

verse the direction of rotation of the motor between each raising and lowering operation of the flag.

3. A flag raising and lowering mechanism embodying a drum having a flag halyard wound thereon in opposite directions and a flag secured to the halyard, an electric motor connected to the drum for rotating the latter, time controlled means for closing the circuit of the motor to raise and lower the flag at predetermined intervals, a reversing switch included in the motor circuit and automatically operated to reverse the direction of rotation of the motor between each raising and lowering operation and moisture controlled means for lowering the flag and operating the reversing switch independent of the time controlled means.

4. A flag raising and lowering mechanism embodying a drum having a flag halyard wound thereon in opposite directions and a flag secured to the halyard, an electric motor connected to the drum for rotating the latter, time controlled means for closing the circuit of the motor to raise and lower the flag at predetermined intervals and a reversing switch included in the motor circuit and automatically operated to reverse the direction of rotation of the motor between each raising and lowering operation, a moisture controlled switch included in a circuit tapped on to the motor circuit for closing the latter independent of the time controlled means and a circuit breaking relay included in the moisture controlled switch circuit.

In testimony whereof I affix my signature.
FRANK ZIPOY.