Oct. 9, 1923. 1,470,277

A. B. LOFTUS

AUTOMATIC REGULATOR

Filed April 24, 1922

Fig. 1.

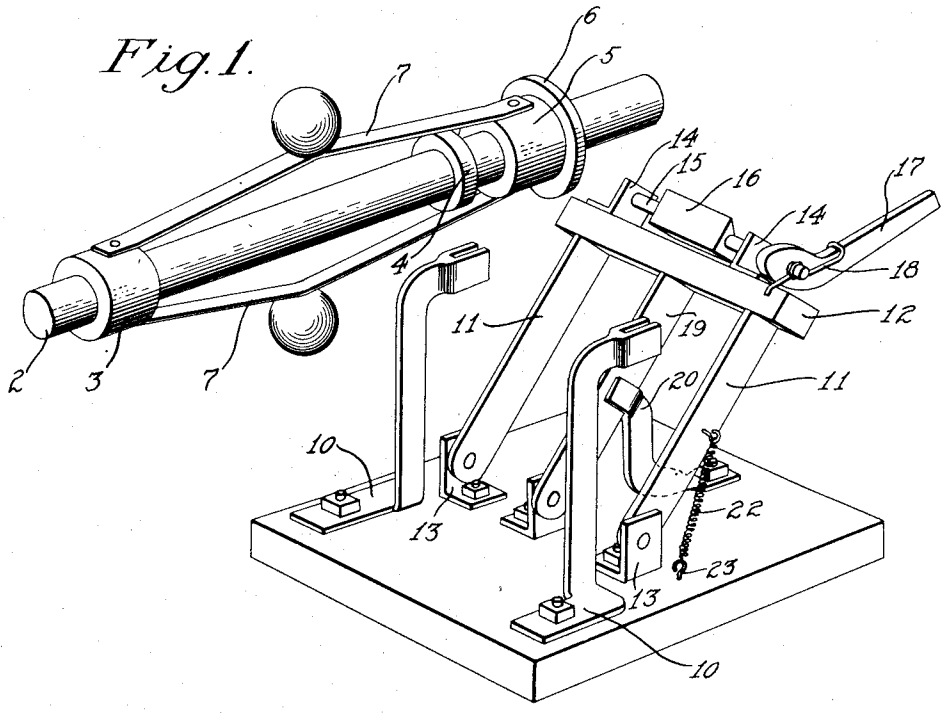


Fig. 2.

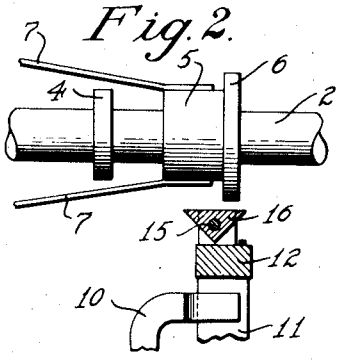


Fig. 3.

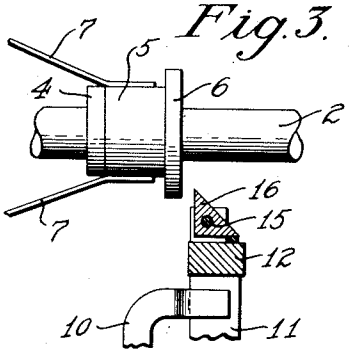
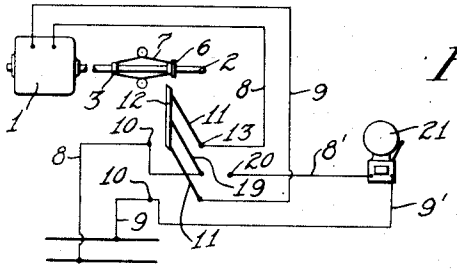


Fig. 4.



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Patented Oct. 9, 1923. 1,470,277

UNITED STATES PATENT OFFICE.

ANDREW B. LOFTUS, OF ARCHBALD, PENNSYLVANIA.

AUTOMATIC REGULATOR.

Application filed April 24, 1922. Serial No. 556,246.

To all whom it may concern:

Be it known that I, ANDREW B. LOFTUS, a citizen of the United States, residing at Archbald, Pennsylvania, have invented certain new and useful Improvements in an Automatic Regulator, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention comprises an automatic regulator. While its application is unrestricted, it is especially useful in maintaining a uniform speed of motor driven appliances and keeping the speed within certain predetermined limits, the arrangement being such that when this limit is passed the motor will be shut off and an alarm sounded.

More specifically, the invention relates to an association of an electrical circuit by which the motor is driven and a switch controlling the circuit, in such a way that the switch may be closed to start the motor, and a governor allowed to pass over a portion of the switch in one direction until the speed falls below a certain limit, when the governor will, in moving the opposite direction, actuate the switch to open the circuit and at the same time close an alarm circuit. This principle can be utilized to be operated at the other limit, or when the speed has exceeded a certain predetermined limit, or by using two devices or a double switch both limits can be accommodated in the same apparatus.

Other objects and advantages will be brought out more fully in the description which follows.

An embodiment of the invention which illustrates its principles generally, is shown in the accompanying drawing, in which:

Fig. 1, is a view in perspective showing an embodiment of my invention the parts being in open or inoperative position and an alarm circuit in closed position;

Fig. 2, is a detail view, partly in section showing the switch in closed position and a portion of the switch in position to allow the governor to pass it in one direction;

Fig. 3, is a similar view showing the portion of the switch set to resist passing of the governor in one direction to open the switch; and

Fig. 4, is a diagrammatic view illustrating the circuit and general assembly.

In these views, 1 designates a motor for driving a shaft 2. Mounted on this shaft there is a governor element comprising a fixed collar 3, attached to the shaft, a limit stop 4, and a slidable collar 5, carrying a switch actuating flange or extension 6. This latter collar is connected with the fixed collar 3 through resilient spreader members 7 which are weighted centrally so that they spread under centrifugal action and this spreading is utilized to move collar 5 along the shaft in a well known manner.

This movement of collar 5 is utilized to open a switch which controls the motor circuit. As here shown current comes from a suitable source of supply through leads 8 and 9 to suitable terminals 10, here shown as the socket members of a switch. These cooperate with the blades 11 of a knife switch, the blades being connected at their outer ends by a cross bar 12, and pivoted at their inner ends to terminals 13, from which extensions or continuations of leads 8 and 9 are carried to the motor. Mounted on cross bar 12, there are two upstanding supporting members 14 which form a bearing for a shaft 15. This carries, intermediate the supports, a rocking latch member 16, and upon an end of the shaft an actuating lever 17. The latch member is triangular in cross section and is normally held in position shown in Fig. 3, and placed to be in the line of movement of the flange on collar 5. For the purpose of holding the latch member in this position and at the same time permitting it to be over-ridden by the flange in one direction, there is provided a spring 18, wound around the shaft and normally holding the actuating lever back in the position shown in Fig. 1. If the lever is actuated to close the switch from the position shown in this figure, the first movement will be to tilt the latch member into the position shown in Fig. 2. This permits it to pass under the flange 6 on collar 5 and after having passed to be brought to the position shown in Fig. 3. When the motor starts the flange 6 on collar 5 will be moved to the left, overriding the slanted portion of the latch member, which tilts until the collar passes the edge of the latch, when it is brought to upstanding position again under the action of the spring 18. Should the shaft slow down sufficiently to allow the collar 5 to move back to the right, this action will bring flange 6 on the collar into engagement with the upstanding portion of latch member 16. This member being triangular in shape, has a base portion normally in engagement with

the cross bar 12, and movement of the flange to the right will open the switch and stop the motor.

Means are also provided for closing an alarm circuit when this action takes place, and as here shown a third blade 19 is provided, being pivoted to a terminal which is connected to one of the leads, say 8. When the switch is in open position, this blade is adapted to fit a socket forming a part of another terminal 20. This closes an alarm circuit which comprises lead 8', alarm 21, and return wire 9' to lead 9.

Means are provided for quickly throwing switch into open position after it has been started under the action of flange 6, and as here shown there is secured to one of the knife blades, intermediate its ends, one end of a spring 22. The other end of this spring is attached to a hook 23 so placed that when the switch is closed the tension will be in a vertical direction or neutral, but when the action of the flange 6 displaces the centre line by moving the blades to the right, as in Fig. 1, tne spring will act to force the blades quickly in this direction. This action eliminates sparking and assures quick and positive connection or closing of the alarm circuit through blade 19 and terminal socket 20.

It will be understood that while the action has been described as taking place when the speed is reduced beyond a certain pre-determined limit, that by placing the latch member at the other side so as to be actuated when the speed of the shaft exceeded a predetermined amount the circuit would be opened and the motor stopped also. While it has been disclosed in the present embodiment, it will be understood that many changes in the general arrangement and construction are contemplated as being within the scope of the invention as set forth in the claims.

What I claim is:

1. An automatic regulator including a switch; a latch member mounted on the switch; means associated with the switch and latch permitting an actuating instrumentality to operate the latch in one direction without operating the switch; and means for effecting operation of the switch when the latch is moved in another direction.

2. An automatic regulator including a switch; a latch member tiltably mounted on the switch; a latch operating instrumentality juxtaposed thereto, and means governed by the speed of an instrumentality for moving the latch operating instrumentality; said latch being tiltable in one direction without operating the switch.

3. An automatic regulator including a switch; a latch member tiltably mounted on the switch; a latch operating instrumentality juxtaposed thereto; and means governed by the speed of an instrumentality, for moving the latch operating instrumentality; said latch being tiltable in one direction without operating the switch, and normally in position to actuate the switch when the latch operating mechanism engages the latch and moves it in another direction.

4. An automatic regulator including a switch; a latch member, tiltably mounted on the switch; a latch operating instrumentality juxtaposed thereto and movable into and out of engagement with the latch whereby movement of the latch operating instrumentality in one direction will tilt the latch and permit the operating instrumentality to ride over the latch; and movement of the operating instrumentality in another direction will engage a face of the latch and operate the switch.

5. An automatic regulator including a switch; a latch member, tiltably mounted on the switch; a latch operating instrumentality juxtaposed thereto and movable into and out of engagement with the latch whereby movement of the latch operating instrumentality in one direction will tilt the latch and permit the operating instrumentality to ride over the latch; and movement of the operating instrumentality in another direction will engage a face of the latch and operate the switch; and means associated with the latch and the switch for normally holding the latch in the path of travel of the operating means to be operated thereby in one direction.

6. An automatic regulator including a switch; a latch member, tiltably mounted on the switch; a latch operating instrumentality juxtaposed thereto and movable into and out of engagement with the latch whereby movement of the latch operating instrumentality in one direction will tilt the latch and permit the operating instrumentality to ride over the latch; and movement of the operating instrumentality in another direction will engage a face of the latch and operate the switch; means associated with the latch and the switch normally holding the latch in the path of travel of the operating means to be operated thereby in one direction; and an operaitng lever associated with the latch for manually operating the switch and latch.

7. An automatic regulator comprising a switch; a latch member tiltably mounted on the switch; a speed governor including a latch operating member, juxtaposed to the latch, the operating member being movable in relation to the latch; said latch being tiltable in one direction without operating the switch; and movement of the operating member in another direction effecting a connection between the member and switch to operate the latter.

8. An automatic regulator comprising a switch; a latch member tiltably mounted on the switch; a speed governor including a latch operating member, juxtaposed to the latch, the operating member being movable in relation to the latch; said latch being tiltable in one direction without operating the switch; movement of the operating member in another direction effecting a connection between the member and switch to operate the latter; and a lever on the latch for manually operating the latch and switch.

In testimony whereof I affix my signature.

ANDREW B. LOFTUS.