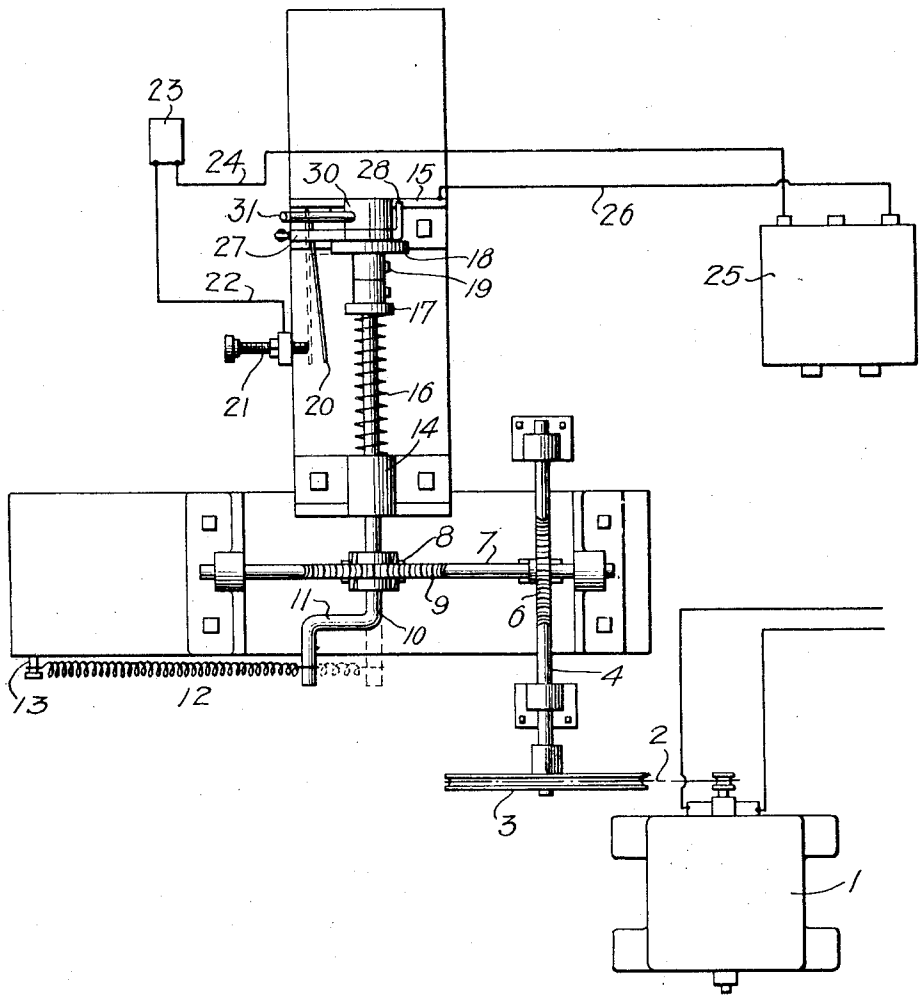
April 21, 1931. M. E. TRAGER 1,801,699

TIME ALARM SWITCH OPERATING MECHANISM

Filed May 31, 1930 2 Sheets-Sheet 1

Fig 1



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TIME ALARM SWITCH OPERATING MECHANISM

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Fig. 2

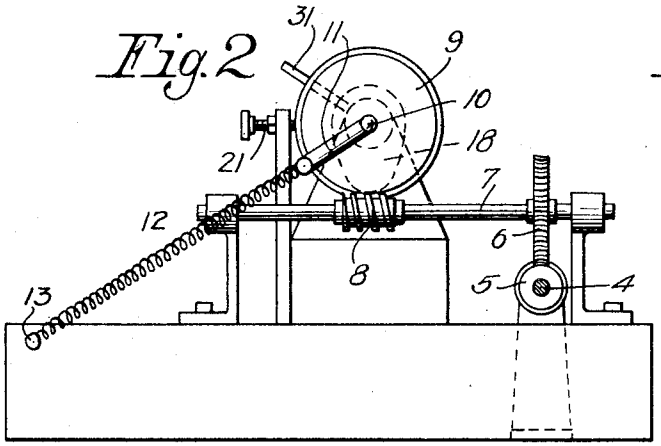


Fig. 3

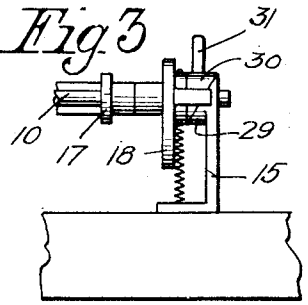


Fig. 4

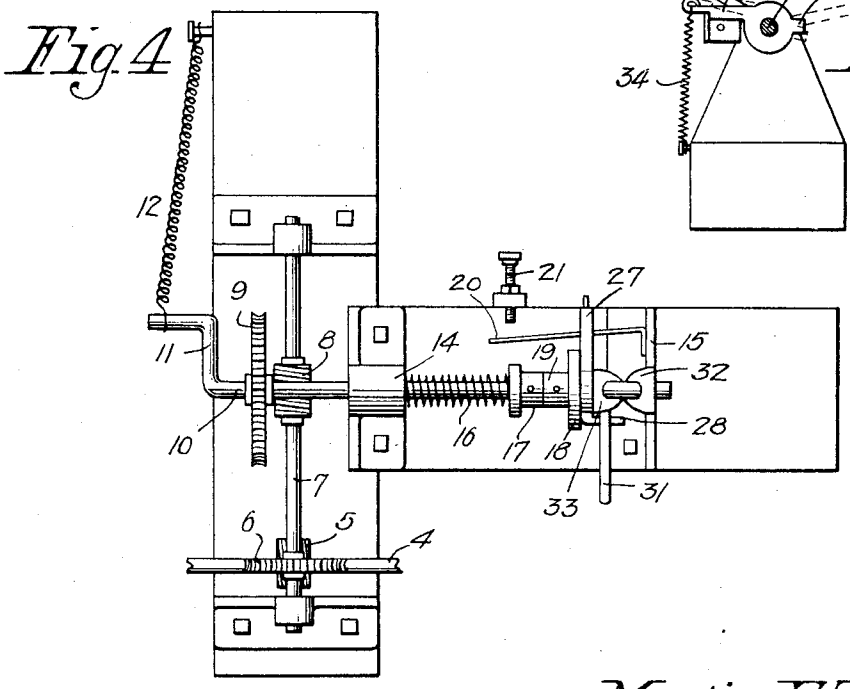


Fig. 5

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UNITED STATES PATENT OFFICE

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TIME ALARM-SWITCH-OPERATING MECHANISM

Application filed May 31, 1930. Serial No. 458,651.

This invention relates to time alarm switch operating mechanism, and is intended to be applied to any apparatus that requires to be driven for a given length of time and then reset or stopped. It is important that by means of an audible or other signal the termination of the predetermined period of movement of the particular contrivances involved shall be positively called to the attention of the attendant. This invention is especially useful in connection with cement mixers, in which certain specified quantities of sand, cement, water and other materials are rotated for a certain time in order that an intimate mixture may result, and it is advantageous that the period be the same for each charge of the machine employed in the same work.

It is an object of this invention to provide devices of the nature stated wherein adjustment may be made to allow the operation to continue for any chosen length of time, and which comprises parts of special construction and combination believed to be economical to manufacture and operate, easy to understand and control, and very dependable for the purposes desired. The formation and disposition of the parts of this invention in its preferred structure are illustrated in the accompanying drawings constituting a portion of this application.

Of the drawings, Fig. 1 represents a view taken from above the machine, and showing all parts assembled. Fig. 2 is an endwise view with the motor omitted. Fig. 3 is a side view of the cam shaft shifting blocks or bosses engaged. Fig. 4 is a vertical sectional view taken on the broken line 4—4 of Fig. 3. Fig. 5 is a view taken from above similar in part to Fig. 1 and showing the cam shaft shifting members disengaged.

Throughout the drawings and description the same number is used to refer to the same part.

Considering the drawings, a suitable motor 1 is connected by a belt 2 with a grooved pulley 3 at the end of a worm shaft 4. The worm 5 on the shaft drives a worm wheel 6 on a transverse or way shaft 7 upon which is a worm 8 normally in mesh with a worm wheel 9 on the cam shaft 10. The shaft 10 has a terminal crank 11 controlled by a coil spring 12 extending in a radial direction with respect to the axis of the cam shaft and attached to a pin 13. The cam shaft is carried in suitable supporting bearings 14 and 15, and is encircled by a coil spring 16 one end of which acts against the bearing 14 and the other against a collar or sleeve 17 secured upon the cam shaft.

A cam 18 is secured by means of a set screw 19 on the cam shaft in adjustable relation thereto, and in the path of the revolution of the cam is an elastic switch arm 20 attached to the shaft support 15 and held by its own elasticity normally out of touch with a contact 21 in the path of the arm when the arm is moved by the cam. The contact 21 is connected by the conductor 22 with an electrically operated alarm 23, from which a conductor 24 leads to a battery 25, or other source of electric current. From the other pole of the battery, the conductor 26 is led to the support 15.

Riding the cam shaft usually next to the cam is a catch 27 for holding the switch arm against the contact 21 as explained hereinafter.

The catch 27 has a handle or finger 28 by which it may be rocked on the shaft by hand and the catch may be actuated by the means employed to shift the cam shaft lengthwise. Such means in this invention comprises two cylindrical blocks or bosses 29 and 30, the first is attached to the support 15 and is stationary with the cam shaft passing through it. The block 30 is revoluble on the shaft by the handle 31 and the finger 28 of the catch is arranged in the path of the revolution of the handle 31. As best shown in Fig. 3 each of the blocks 29 and 30 has an inclined face marked respectively 32 and 33, and those inclined faces slant with respect to the axis of the cam shaft and are normally in contact as shown in Fig. 3.

The motor and the worm driven shafting described provides a speed reducing gearing for the apparatus. In the operation the motor is started and the cam shaft is rotated against the force of the spring 12. In its

revolution the cam 18 meets and moves the switch arm against the elasticity of that arm into contact with the electrically connected screw 21 completing the circuit and sounding the alarm 23. At the same time, the catch 27 by the action of its spring 34, as best shown in Fig. 5, is drawn downwardly and latches the switch arm against the contact 21 as indicated by broken lines in Fig. 1. The attendant is notified and resets the apparatus by grasping the handle 31 of the slant block 30 and turning the block. By reason of the face to face contact of the inclined surfaces 32 and 33, the worm wheel 9 is disengaged from the worm 8, and the spring 12 acts, on either side of the dead center, to return the cam shaft into its normal position as shown in Fig. 2. It is believed to be clear that by adjusting the cam 18 on its shaft by the set screw 19 the cam may be made to move the switch arm earlier or later in the operation. In other words the duration of the operation may thus be controlled.

Having now described this invention and explained the mode of its operation, I claim:—

1. In a time alarm switch operating mechanism, the combination with a motor, of speed reducing gearing, a cam shaft driven by said reducing gear, a cam secured on said shaft, a resilient switch arm arranged in the path of the revolution of the said cam and moved thereby, a contact in the path of the switch arm, the said switch arm being normally positioned out of touch with said contact, the said cam adapted to move the switch into connection with the contact, a catch arranged to maintain the switch against the contact, and means carried movably by said cam shaft and arranged to act upon the catch to free the switch arm and allow the same to regain its normal open position.

2. In a time alarm switch operating mechanism, the combination with a motor, of speed reducing gearing, a cam shaft driven by said reducing gear, a cam secured upon the said shaft, a resilient switch arm arranged in the path of the revolution of the cam and moved thereby, a contact in the path of the switch arm, the said switch arm being normally positioned by its own elasticity out of connection with the contact, the said cam being constructed and arranged to move the switch into connection with the contact, a catch arranged to maintain the switch arm on said contact, means for moving said cam shaft lengthwise and disengaging the said reducing gear, said means acting upon the catch to free the said switch arm whereby the same is allowed to regain its normal position, and spring operated means for rotating the cam shaft when said gear is disengaged whereby the said shaft and cam are returned into a predetermined position.

3. In a time alarm switch operating mechanism, the combination with a motor, of speed reducing gearing, a cam shaft driven by the said reducing gear, a cam secured upon the said shaft, a resilient switch arm arranged in the path of the revolution of the cam, a contact in the path of the switch arm, the said switch arm being normally positioned by its own elasticity out of connection with the said contact, the said cam being arranged to move the switch arm into connection with the contact, means for moving said cam shaft lengthwise and disengaging the reducing gear, said means acting upon the catch to free the same whereby the switch arm is allowed to regain its normally open position, the said cam shaft having a crank at one end, and a spring attached to the crank whereby the cam and cam shaft are rotated and returned to a predetermined position from either side of the dead center when the gear is disengaged.

4. In a time alarm switch operating mechanism, the combination with a motor, of speed reducing gearing, a cam shaft driven by said reducing gear, a cam secured upon the said shaft, a resilient switch arm arranged in the path of the revolution of the cam and moved thereby, a contact in the path of the switch arm, the said switch arm being normally positioned by its own elasticity out of touch with the said contact, the said cam being constructed and arranged to move the switch arm into connection with the contact, a catch arranged to engage and maintain the switch arm on said contact, means for moving the said cam shaft lengthwise and disengaging the said reducing gear, the said means comprising two portions centered on said shaft and one of said portions being stationary on said shaft and one being loose thereon, each portion having a face inclined with respect to the axis of the cam shaft, the said inclined faces being movably in contact, means for turning the said loose portion against the stationary portion to move the cam shaft lengthwise, and means for operating the catch to free the switch arm whereby the same is allowed to regain its normally open position.

In testimony whereof I affix my signature.

MARTIN E. TRAGER.