July 22, 1941. L. M. ESBECK 2,250,154

TRAFFIC SIGNAL

Filed Feb. 21, 1938 2 Sheets-Sheet 1

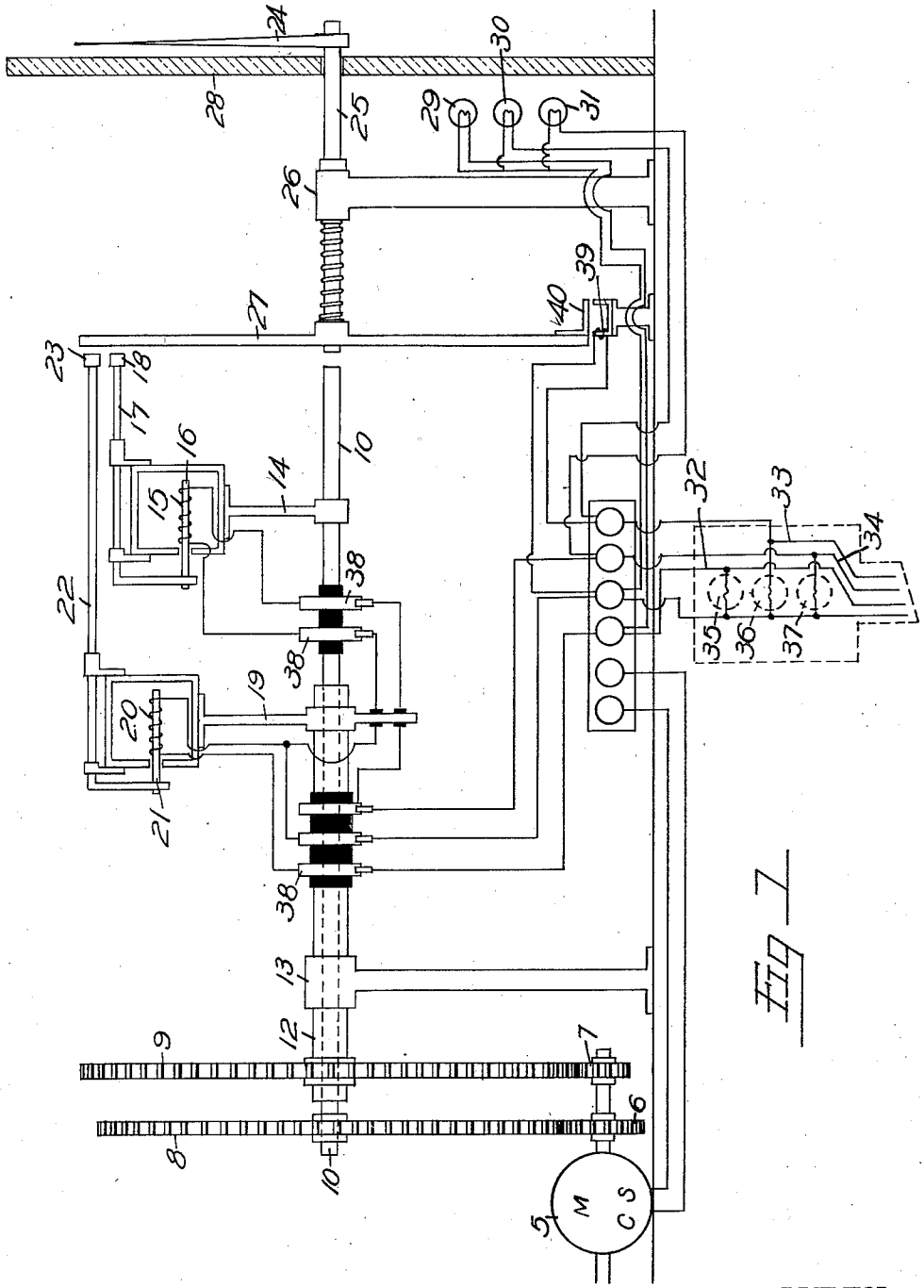


Fig. 1

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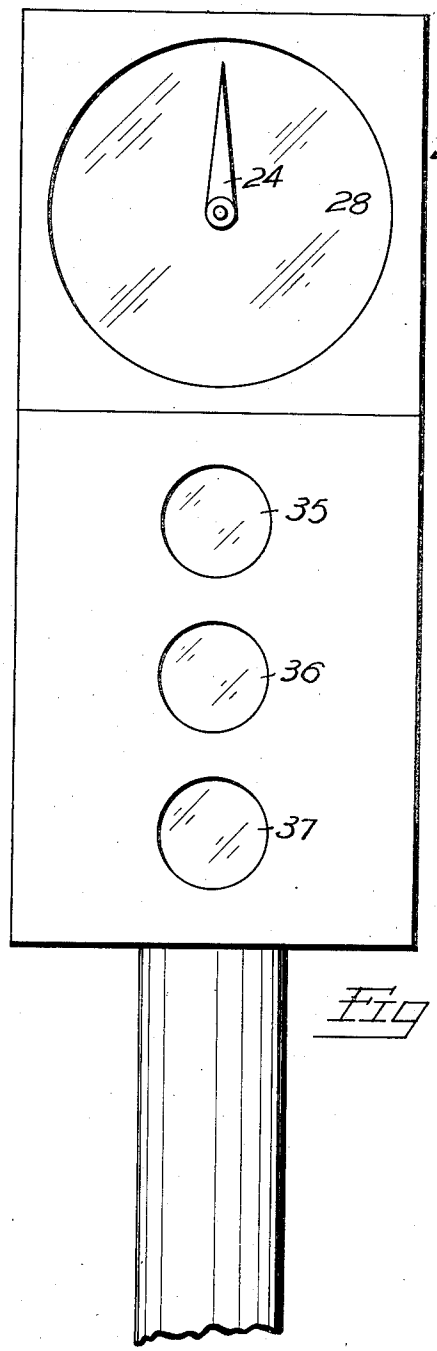


Fig 2

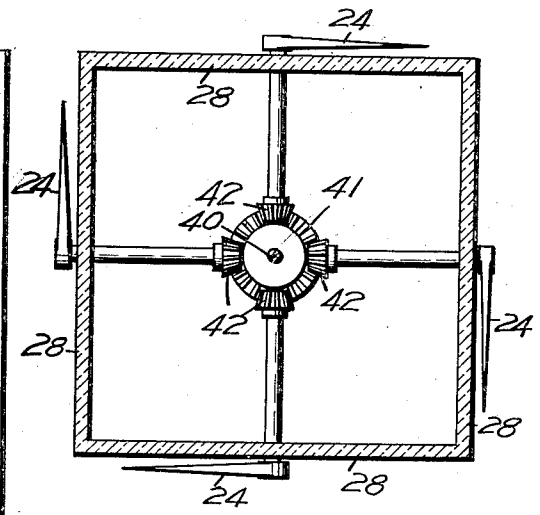


Fig 3

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TRAFFIC SIGNAL

Leonard M. Esbeck, Denver, Colo.

Application February 21, 1938, Serial No. 191,753

6 Claims. (Cl. 177—337)

This invention relates to improvements in traffic signals.

A principal object of the invention is to provide an indicative element in a traffic control system that will indicate at all times the proportion of each "stop" and "go" period that has elapsed and the proportion that remains before the next signal change will occur.

Another object is to provide such a device that can be illuminated for ready visibility at night or on cloudy or foggy days.

A further object is to provide an improvement of this character in a traffic control system that will operate at street intersections where the "stop" and "go" periods are of unequal duration.

A still further object is to provide such a system that can be arranged for visibility in a plurality of directions.

Other objects and advantages reside in details of design and construction that will be more fully disclosed in the following description and in the drawings wherein like parts have been similarly designated and in which;

Figure 1 is a diagrammatic representation of electrical circuits and mechanism suitable for use with this invention;

Figure 2 is a front elevation of a traffic signal made according to this invention; and

Figure 3 is a sectional view illustrating a modified form of the invention.

In the drawings reference character 5 denotes a constant speed motor which drives pinions 6 and 7 of different diameters. The pinions are in mesh with gears 8 and 9 respectively which are driven at different rates of speed because of the different driving ratios.

Gear 8 is mounted on a shaft 10 that is journalled in a hollow shaft 12 which is driven by the gear 9 and which is journalled in a suitable bearing as at 13. Carried on the shaft 10 is an arm 14 that supports a solenoid 15 inclusive of a movable magnetic core 16 which is operably connected to an arm 17 which carries at an end thereof a friction element 18. Mounted on the shaft 12 is a similar mechanism comprising an arm 19, a solenoid 20 having a movable core 21, an arm 22 and a friction element 23 at an end thereof.

An indicative element in the form of a hand or pointer 24 is mounted on an independent shaft 25 which is journalled at 26 and on which is a friction disk 27 positioned adjacent the friction elements 18 and 23. A transparent or translucent sheet of glass or the like is indicated at 28 to furnish a luminous background for the indicative element 24, when so desired. Electric lamps 29, 30, and 31 are positioned adjacent the side of the glass that is opposite from the pointer, and are connected with electric circuits 32, 33 and 34 that alternately conduct energy to traffic lights 35, 36, and 37, that are of the usual type.

The solenoid coils, 15 and 20, are also connected with the respective circuits 34 and 32, through the intermediary of collector rings 38, on the shafts 10 and 12.

Normally, the indicative element is mounted near the usual traffic lights or other form of traffic signals, as shown in Figure 2.

Operation

In use, the circuits 32, 33, and 34 and the traffic signals or lights 35, 36, and 37 are alternately energized by mechanism of the well known character. The lamps adjacent the indicative element correspond in color to the traffic lights and are connected to be illuminated to correspond with the traffic lights as they are alternately energized.

The solenoids are energized only when the "stop" and "go" signals are operated and their respective friction elements 18 and 23 are drawn into contact with the clutch disk 27 on the indicative element to rotate it one complete revolution during each "stop" and "go" period, the respective shafts 10 and 12 being rotated at the correct predetermined speeds for the purpose. The shafts are rotated at different speeds when the duration of the "stop" and "go" periods is different, as often is preferred. If the periods are the same, then one shaft and one friction element is sufficient, in which case a single solenoid assembly with a double winding and the proper connections with the respective circuits would be used. Or both shafts can be rotated at the same speed.

At the caution period, traffic light 36 is energized, and indicative light 30 is also illuminated to correspond therewith in color, usually amber. A stationary electromagnet 39 is connected to be energized during the caution period, and it acts on an armature 40, on the disk 27, to draw and hold it in a position where the hand or pointer 24 is vertical or on "caution." As soon as the next "stop" or "go" period begins, one of the electromagnetic clutches is operated to rotate the pointer one revolution.

In the form of the invention illustrated in Figure 3 a plurality of indicative elements 24 are

illustrated as facing in four different directions to be visible to all lines of traffic in an ordinary 90° street intersection. Back of each indicative element is a transparent or translucent sheet **28** for the purpose above described. Obviously, still more indicative elements may be used for visibility in as many directions as desired and at any angle required by surrounding conditions. When a plurality of indicative elements is used a shaft **40** drives a bevel gear **41** that meshes with bevel pinions **42**, one of which is directly connected to drive each indicative element. The shaft **40** is in driven connection with the shaft **25** shown in Figure 1, which connection may be a pair of miter gears or any other suitable transmission mechanism.

Thus, according to any form of the invention, a motorist or a pedestrian can judge from the position of the indicative pointer, whether it is safe to enter an intersection or cross a street, or whether the "go" period is about to end, and like the "stop" period can be judged to prepare for the next "go" signal.

What I claim and desire to secure by Letters Patent is:

1. In a traffic signal inclusive of electrically operated alternately energized signals and a rotary time-lapse indicator, the improvement which comprises a shaft rotated at a constant speed and coordinated with the time cycles of the alternately energized signals, an electrically operated indicator-driving clutch mechanism carried upon the shaft for conjoint rotation therewith, an electric circuit inclusive of a brush and a rotary contact connected with the clutch mechanism and with the energizing circuit of the signals whereby the clutch mechanism is energized conjointly with the signals to rotate said indicator during such energization.

2. In a traffic signal inclusive of electrically operated alternately energized signals and a rotary time-lapse indicator, the improvement which comprises a plurality of shafts driven at different constant speeds and coordinated with the time cycles of the alternately energized signals, an electrically operated indicator-driving clutch mechanism on each of said shafts for conjoint rotation therewith, electrical circuits connecting the respective clutch mechanisms with the respective energizing circuits of the signals whereby the respective clutch mechanisms are energized in synchronization with the respective signals to rotate said indicator during such energized periods.

3. In a traffic signal inclusive of electrically operated alternately energized signals and a rotary time-lapse indicator, the improvement which comprises a plurality of concentrically journalled shafts driven at different constant speeds and coordinated with the time cycles of the alternately energized signals, an electrically operated indicator-driving clutch mechanism on each of said shafts for conjoint rotation therewith, electrical circuits connecting the respective clutch mechanisms with the respective energizing circuits of the signals whereby the respective clutch mechanisms are energized in synchronization with the respective signals to rotate said indicator during such energized periods.

4. In a traffic signal inclusive of electrically operated alternately energized signals and a rotary time-lapse indicator, the improvement which comprises a plurality of concentrically journalled gear-driven shafts driven at different constant speeds and coordinated with the time cycles of the alternately energized signals, an electrically operated indicator-driving clutch mechanism on each of said shafts for conjoint rotation therewith, electrical circuits connecting the respective clutch mechanisms with the respective energizing circuits of the signals whereby the respective clutch mechanisms are energized in synchronization with the respective signals to rotate said indicator during such energized periods.

5. In a traffic signal inclusive of electrically operated alternately energized signals and a rotary time-lapse indicator, the improvement which comprises a plurality of shafts respectively driven at constant speeds approximately equal to one revolution during the respective periods of energization of the signals, an electrically operated indicator-driving clutch mechanism on each shaft, and electrical circuits connecting the respective clutch mechanisms with the respective energizing circuits of the signals whereby the indicator is rotated substantially one revolution during each period of energization of the signals.

6. In a traffic signal inclusive of an electrically operated intermittently energized signal and a rotary time-lapse indicator, the improvement which comprises a shaft driven at a constant speed approximately equal to one revolution during the period of energization of the signal, an electrically operated indicator-driving clutch mechanism on the shaft, and an electrical circuit connecting the clutch mechanism with the energizing circuit of the signal whereby the indicator is rotated substantially one revolution during each period of energization of the signal.

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