No. 883,992. PATENTED APR. 7, 1908.

W. F. WENTZ.

ELECTRIC TIME INDICATING DEVICE.

APPLICATION FILED DEC. 22, 1904.

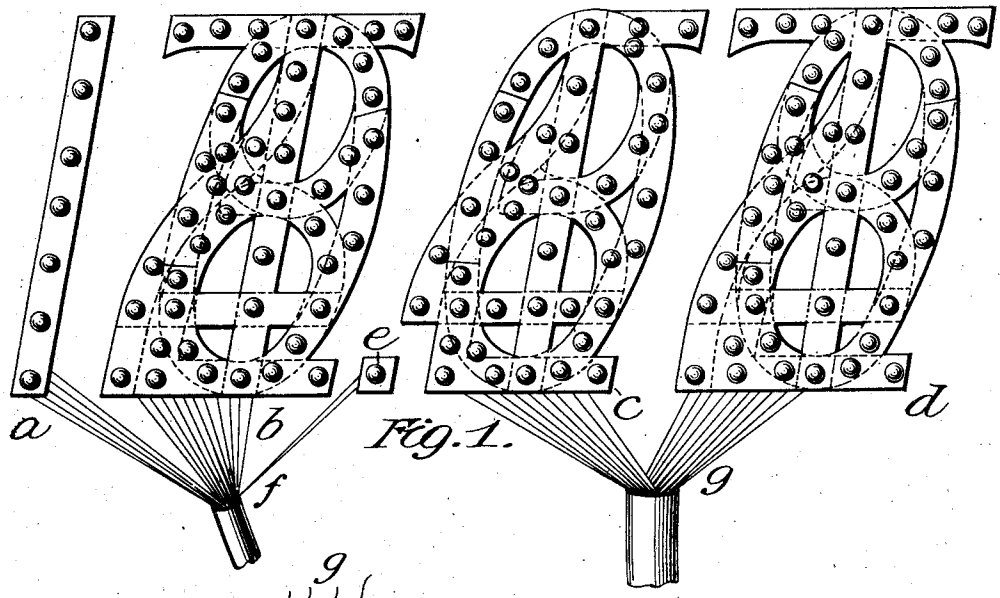

Fig. 1.

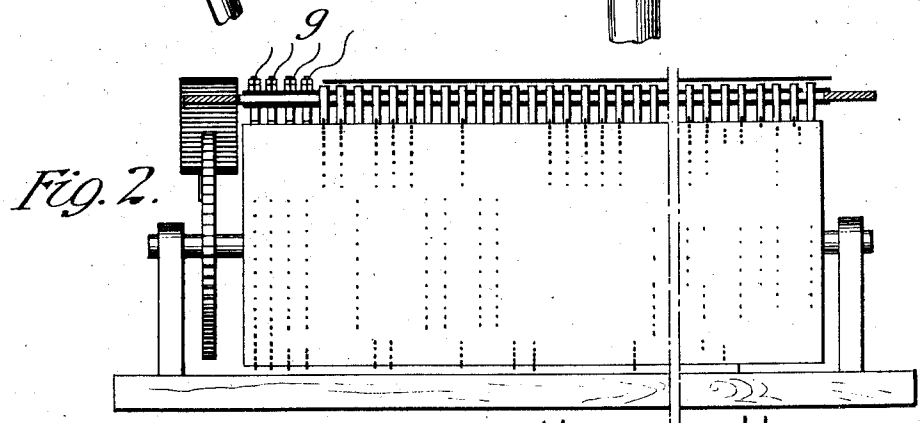

Fig. 2.

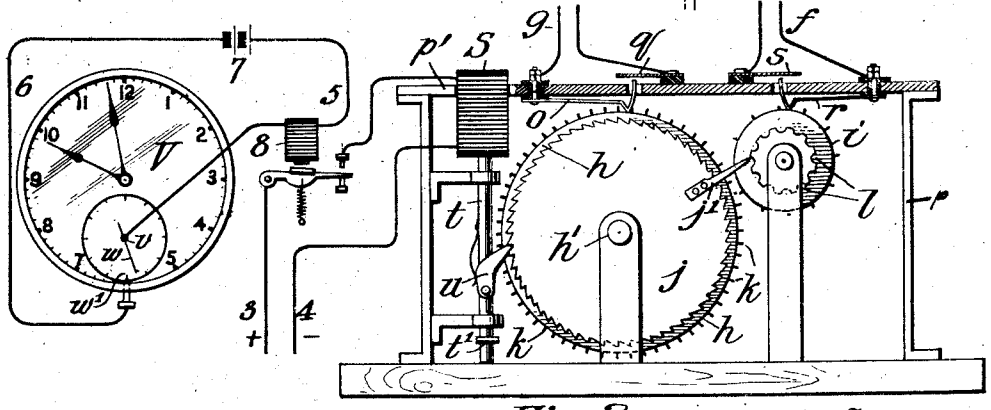

Fig. 3.

Witnesses
Frank S. Ober
Miles M. Clapin

Inventor
William F. Wentz
By his Attorneys
Rosenbaum & Stockbridge

UNITED STATES PATENT OFFICE.

WILLIAM F. WENTZ, OF NEW YORK, N. Y.

ELECTRIC TIME-INDICATING DEVICE.

No. 883,992. Specification of Letters Patent. Patented April 7, 1908.

Application filed December 22, 1904. Serial No. 237,906.

To all whom it may concern:

Be it known that I, WILLIAM F. WENTZ, a citizen of the United States, residing at the city of New York, in the borough of Manhattan and State of New York, have invented certain new and useful Improvements in Electric Time-Indicating Devices, of which the following is a full, clear, and exact description.

This invention is an electrically operated apparatus for indicating time by means of electric lamps, and comprises a bank of electric lamps so connected in groups that when the lamps of the different groups are lighted, they will form the numerals corresponding to the different hours and minutes of time. In connection with the bank of lamps, it is proposed using a selective switch determining the order in which the groups of lamps shall be lighted, and a clock or other suitable time device controlling the operation of the selective switch.

The construction in detail will be described hereinafter with reference to the accompanying drawing, and the features of novelty particularly pointed out in the claims.

Figure 1 is a plan of the bank of lamps used to display the hours and minutes of time; Fig. 2 is a side elevation of the selective switch, and Fig. 3 is an end elevation of the switch with parts in section and also comprising the timing device and electric circuits.

The bank of lamps comprises four main groups, the first of which, indicated by *a*, is a straight line of lamps always representing the figure one, when lighted; the second group, indicated by *b*, contains lamps forming a sort of monogram so arranged that ten different ordinal digits, ranging from zero to nine, inclusive, may be represented by lighting groups of lamps therein respectively delineating the outlines thereof. The third group, indicated by *c*, contains lamps so arranged that the numerals zero to five, inclusive, may be indicated by lighting groups of lamps therein respectively delineating those numerals, and the fourth group, indicated by *d*, contains lamps by which the numerals zero to nine, can be similarly represented, the same as group *b*. Between groups *b* and *c* a single lamp *e* indicates a period or decimal point. It will therefore be seen that with these four groups of lamps, numerals indicating any hour and minute from twelve o'clock to twelve o'clock can be displayed. The lamps outlining each numeral are included in individual circuits and the various wires of these circuits, indicated conventionally by *f* and *g*, are preferably made up into cables and extended to the switching apparatus shown in Figs. 2 and 3. This apparatus comprises two cylinders *h* and *i*; cylinder *h* is mounted on shaft *h'* together with a ratchet wheel *j*. The ratchet wheel has sixty teeth corresponding to the sixty minutes of an hour, and the cylinder *h* has sixty longitudinal rows of pins or lugs *k* corresponding respectively with the minutes of an hour. The cylinder *i* has twelve notches *l* around its periphery at one end, equally spaced apart and corresponding to the twelve hours of time. The ratchet wheel *j* carries a finger *j'* adapted to engage one of the notches *l* and move the cylinder *i* the space of one of its notches at the completion of each rotation of cylinder *h*. Cylinder *i* also contains rows of pins or lugs similar to those on cylinder *h*, but corresponding to the hours. Arranged above the cylinder *h* is a series of circuit closers which comprise spring tongues *o* corresponding in number to the number of wires or to the number of circuits leading from lamps in groups *c* and *d*, or the minute groups, of the bank of lamps. Each of these tongues is supported by and insulated from the frame *p* and carries a binding post, as shown, by which its corresponding wire can be attached. The extremity of each tongue is bent downward to stand in the path of the pins in the surface of the cylinder *h*; the spring leads thence upward through a perforation in the top plate *p'* of the frame and stands free of, normally, but directly beneath, a plate *q* common to all the springs and being a return circuit for all the lamps in groups *c* and *d*. A similar arrangement is adopted in connection with the cylinder *i* where the spring tongues are mounted to be actuated by the pins of cylinder *i*, and lifted into engagement with the common plate *s*. The tongues *r* and plate *s* are the terminals, respectively, of circuits extending from lamps in groups *a* and *b* of the bank of lamps.

S is a solenoid included in a power circuit 3, 4, and adapted to lift a core or armature *t* arranged in bearings, as shown, and having a limited movement determined by a collar *t'* and the base of the frame. This core carries a pawl *u* engaging the teeth of the ratchet

wheel *j*. The stroke of the core at each movement is sufficient to rotate the ratchet wheel the space of one tooth.

V is a clock or other time keeping device containing a shaft *v* adapted to rotate once a minute and carrying a hand or contact *w* adapted to engage a fixed contact *w'* at the completion of each minute. The hand and contact *w* and *w'*, respectively form the terminals of a local circuit 5, 6, including a battery 7 and a relay 8. The armature of this relay is located in the circuit 3, 4, and holds said circuit open as long as the relay is not energized. At the completion of each minute, the circuit 5, 6, is closed, the armature and relay is attracted and the circuit 3, 4, is closed.

The operation is as follows: Assume the actual time to be two minutes of ten, or 9.58; the lamps in circuit in group *b* will be showing the figure 9, in group *c* the figure 5 will be visible and in group *d* the figure 8 will be visible. At the completion of the current minute by the minute shaft *v*, the terminals *w* and *w'* will connect for a moment, relay 8 will be energized, circuit 3, 4, will be closed and solenoid S will be energized. The core of the solenoid will be lifted, the ratchet wheel and solenoid *h* will be rotated the space of one notch and a new set of pins or lugs *k* will pass under the row of tongues *o* and lift selected ones of them into contact with the plate *q*, thus closing the circuits of a different set of lamps in the *d* group, while repeating or continuing the circuit through the same lamps of the *b* and *c* groups as were formerly lighted.

The change effected in the *d* group causes the lamps therein to show the figure 9 instead of the figure 8. Thus the bank of lamps will then display the figures 9.59 for the period of another minute. At the next closure of the circuit by the minute shaft *v* of the clock and the corresponding additional movement of the cylinder *h*, cylinder *i* will be moved one notch by the engagement of the finger *j* and a new set of pins or lugs will be passed under the row of tongues *o* and also under the row of tongues *r*. The selected tongues will close such circuits that the figures displayed in each of the groups *a*, *b*, *c* and *d* will be changed; the lamps in group *a*, which before were not lighted, will now be lighted and zero will be shown in groups *b*, *c* and *d*. The period or decimal point remains lighted constantly. The time will therefore be indicated as ten o'clock. At the next change 10.01 will appear and at the next 10.02, and so on for each minute of the twelve hours. If the lamps are displayed outside and for only a portion of the evening, the combinations will be fewer, covering only a period of time from dusk to, say, midnight, but if the device is used in an apartment or room where it is dark, it can be used during the day and night and then will contain all of the combinations for the twelve hours.

Having described my invention, I claim:—

1. In a time indicating device, a frame having a plate which is perforated, a drum horizontally journaled beneath said plate, said drum having pins upon its periphery, springs fixed to the under side of said upper portion of the frame and lying in the path of said pins, said springs being bent to project through said perforations in the plate, contacts on the outer side of said plate in the path of said springs whereby the terminals are exposed for the circuit connections, and means for intermittently imparting a movement of rotation to said drum.

2. In a time indicating device, a frame having a plate which is perforated and having a pair of drums journaled therebeneath, each of said drums having pins upon its periphery and being journaled to present its preripheral surface at a uniform distance from the under side of said plate, springs fixed to said plate and in the path of said pins, said springs projecting through the said plate, and terminals on the outside of the plate and engaged by said springs.

In witness whereof, I subscribe my signature, in the presence of two witnesses.

WILLIAM F. WENTZ.

Witnesses:
A. G. KINCAID,
T. C. WHITEMAN.