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TELEPHONIC TIME ANNOUNCING SYSTEM

Filed Dec. 13, 1929

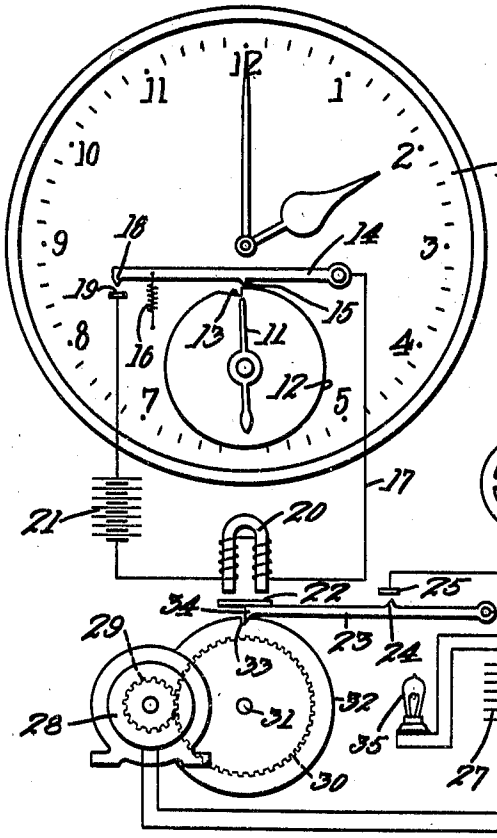


Fig. 1.

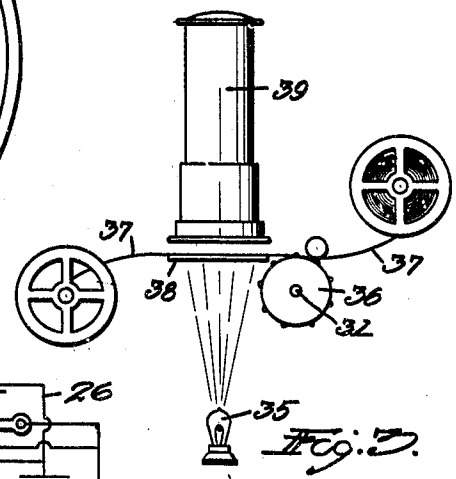


Fig. 3.

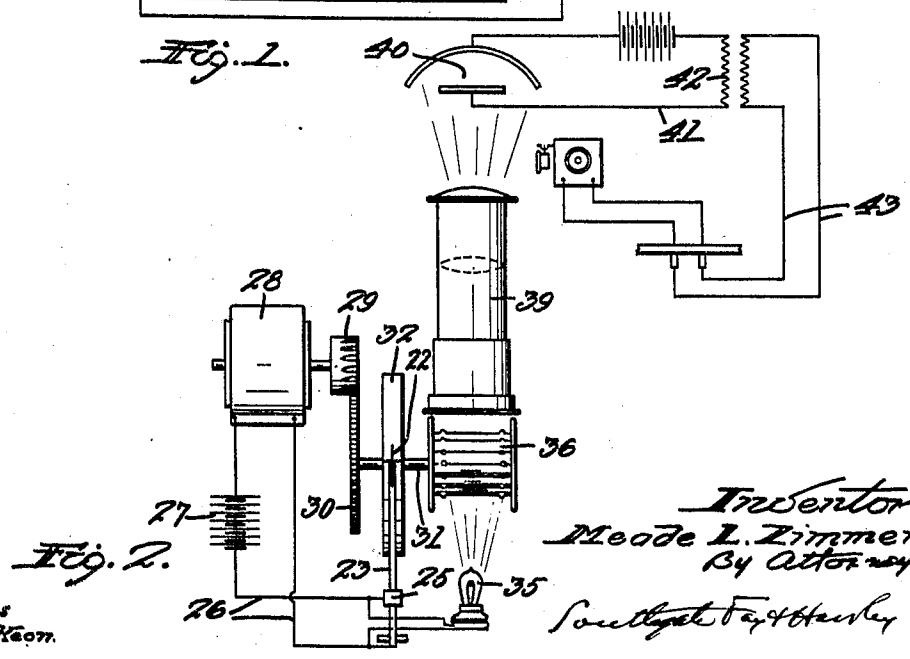


Fig. 2.

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UNITED STATES PATENT OFFICE

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TELEPHONIC TIME-ANNOUNCING SYSTEM

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This invention relates to a system for automatically giving the time over the telephone to any party who asks for it.

The principal objects of the invention are to provide a practical system for this purpose; to provide means for synchronizing a talking element which gives the time over the telephone with a standardized clock; and to provide a control from the second hand of the standardized clock for an operating means for the talking element.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is a diagrammatic view and wiring diagram of the means for controlling and operating the talking element;

Fig. 2 is an end elevation of the talking element and operating means with a wiring diagram of the telephone circuit, and

Fig. 3 is a side elevation of one form of talking element which can be employed in connection with this invention.

It will be understood that the details of the invention can be carried out in many different ways, and that the drawings illustrate one practical apparatus for this purpose. The device, of course, is controlled by a standard clock 10 of any desired character having a second hand 11. On the shaft of this second hand is a wheel or disc 12 having a single notch 13 therein, this notch preferably being abrupt on the forward side and must be slanting or have a gradually curved surface on the rear side.

Cooperating with this notch is a lever 14 having a tooth 15 having an abrupt edge on one side but not necessarily on the other. This lever is shown as being held down against the wheel 12 by a spring 16, although gravity can be depended upon, if desired. It is connected up in an electric circuit 17 having a contact 18, which in the position shown, is held up by a tooth 15 away from another contact 19 which will complete the circuit. In this circuit is an electro-magnet 20. Obviously when the tooth 15 is down in the notch 13, at the end of each minute, a contact 18—19 will be completed and the electro-magnet energized through a source of power 21.

The energization of the electro-magnet 20 will draw up an armature 22 mounted on a lever 23. This lever has a contact 24 adapted to engage a contact 25 and close a circuit 26, having a source of power 27 and connected with a motor 28 to supply the motor with current and cause it to rotate. This motor is provided with a gear or other wheel 29 operating a gear 30 on a shaft 31. Also on this shaft is a wheel or disc 32 which is provided with a notch 33 which is arranged in the opposite manner to the notch 13, and the end of the lever 23 is made square providing a tooth 34.

When the electro-magnet draws the lever 23 up, it draws the terminal tooth 34 on the lever out of the notch 33, and the shaft 31 is free to rotate, which, of course, is accomplished by the motor through the gearing described.

When the wheel 12 has moved around in the usual direction far enough to bring the tooth 15 up on the circular surface of the wheel the contact 18—19 is broken, the electro-magnet is deenergized, the lever 23 is dropped back, but the circuit 26 is not opened. The tooth 34 rests on the circular part of the wheel 32 and keeps the contacts 24 and 25 together. The tooth serves as a positive stop at the end of a complete revolution of a wheel and drops into the notch. The circuit 26 is broken then at 25 so the motor also stops and the light 35, which is in this circuit, is extinguished. This constitutes the means by which the talking element that gives the time over the telephone is perfectly synchronized with the clock.

The circuit 26 may be either an electric light circuit or an accumulator circuit.

On the shaft 31 is shown a reel 36 over which moves a film 37 made in the same way as those used in the talking movies. In this aparatus, the film is made so that it will call out each hour and minute for the twelve hours. Of course, instead of using the talking movie principle, a dictaphone or phonograph or a steel wire properly made could be used. This film can be made as shown in an endless form so that it will repeat the twelve hours without adjustment or rewinding.

The light 35 is located in a position to direct its rays through a frame 38 having a perforation of the desired size through it and carrying the film above it. The rays pass through a projecting device 39 and fall on a photo-electric cell 40 which is located in a circuit 41 and varies the circuit in accordance with the variations in the film. This variation is transmitted through the transformer 42 to a telephone circuit 43.

In the working of the device, a person calls the number assigned to this particular telephone which would figure in the telephone directory as "Time only" or the like. As soon as the bell rings, the motion of the hammer that rings the bell will close another circuit similar to the circuit 17 and not illustrated herein, but which is common in telephone practice. This establishes connection of the apparatus and the person wishing to know the correct time. He will then wait a moment until the second hand on the clock comes to the even minute. This closes the circuit 17 which, as stated, closes the circuit 26. This lights the lamp 35 and puts the motor into action and the film to running in front of the light. The film varies the light which passes through it and falls on the photo-electric cell. The film could be arranged so that if part of the film to be in use is impressed to indicate five minutes past ten, it causes, of course, a corresponding variation in the light that falls on the photo-electric cell so as to make it call over the telephone line 43 "ten five". As soon as the time has been called out, the apparatus cuts off and breaks the connection on the telephone. It takes perhaps three seconds for the call to be completed, allowing for all pauses, because of the reduction in gearing betweer the motor and the shaft 31.

In this way, automatic means is provided for giving the correct time which will always be ready for action and can be used as often as is desired by different subscribers all over the exchange and there is no opportunity for failure as long as the apparatus is kept in working order.

Although I have illustrated and described a single form of the invention and shown it as employed with a particular device for announcing the time, I am aware of the fact that other devices could be used for this particular purpose without departing from the scope of this invention as expressed in the claims.

Therefore, I do not wish to be limited to the exact announcing device shown, but what I do claim is:—

1. In a telephone time announcing system, the combination with a master clock having a rotating hand, of an electric circuit, a motor arranged therein, means whereby whenever the hand completes a revolution, said circuit will be closed and the motor started, a talking element connected to be operated by the motor, a telephone instrument, and means for transmitting the variations of the talking element to the telephone instrument in the form of words announcing the time as represented by said hand.

2. In a telephone time announcing system, the combintaion with a master clock having a second hand, of a normally open electric circuit, a motor arranged therein, means whereby when the second hand completes a revolution, said circuit will be completed and the motor started, a talking element connected to be operated by the motor, a circuit adapted to be variable energized by the talking element, a telephone instrument and a telephone circuit operated by the second circuit for transmitting its variations to the telephone instrument when the same is connected up in its circuit.

3. In a telephone time announcing system, the combination with a master clock having a second hand, of a normally open electric circuit, a motor arranged therein, means whereby when the second hand completes a revolution, said circuit will be completed and the motor started, a talking element connected to be operated by the motor, a light in the motor circuit, a photo-electric cell in position to be variably energized by the light acting through the talking element, a primary circuit with which said cell is connected to produce variations in the primary circuit, a telephone instrument and a telephone circuit operated by the primary circuit for transmitting its variations to the telephone instrument when the same is connected up in its circuit.

4. In a telephone time announcing system, the combination with a clock having a second hand, a wheel rotatable with the second hand and having a notch in its circumference, a lever having a tooth adapted to enter the notch when in registration therewith, a circuit provided with a contact adapted to be closed by the motion of the lever when its tooth enters the notch, an electro-magnet in said circuit, a second circuit, a talking element, a primary circuit having a photo-electric cell therein, means for transmitting light variations from a prepared body of the talking element to the photo-electric cell, a secondary circuit under the influence of the pri-

mary circuit, a telephone instrument connected with the secondary circuit, and means controlled by the second circuit for operating the talking element.

5. In a telephone time announcing system, the combination with a clock having a second hand, a wheel rotatable with the second hand and having a notch in its circumference, a lever having a tooth adapted to enter the notch when in registration therewith, a circuit provided with a contact adapted to be closed by the motion of the lever when its tooth enters the notch, an electro-magnet in said circuit, a second circuit, a motor in the second circuit, a contact lever in the second circuit having an armature thereon adapted to be attracted by the electro-magnet when energized, said second lever being adapted to close the second circuit when the armature is attracted by the magnet, thereby starting the motor, a wheel connected with said motor to be operated thereby and having a notch in its circumference, the second lever having means thereon for entering said notch and stopping the wheel positively when the magnet is not energized and the wheel comes around to the position in which the notch registers with said means on the second lever, a talking element operated by said wheel, a primary circuit having a photo-electric cell therein, means for transmitting light variations from a prepared body of the talking element to the photo-electric cell while the motor is running, a secondary circuit under the influence of the primary circuit, and a telephone instrument connected with the secondary circuit.

6. In a telephone time announcing system, the combination with a clock having hour, minute and second hands, a wheel rotatable with the second hand and having a notch in its circumference, a tooth adapted to enter the notch when in registration therewith, a circuit provided with the contact adapted to be closed by the motion of the tooth entering the notch, an electro-magnet in said circuit, a second circuit, a motor in the second circuit, means in the second circuit having an armature thereon adapted to be attracted by the electro-magnet when energized, said means being adapted to close the second circuit when the armature is attracted, thereby starting the motor, means for opening the second circuit and stopping the motor, a talking element operated by said motor, a telephone instrument and means controlled by said talking element for transmitting to the telephone instrument signals to show the position of the clock hands.

7. In a telephone time announcing system, the combination with a clock having a second hand, a wheel rotatable with the second hand and having a notch in its circumference, a lever having a tooth adapted to enter the notch when in registration therewith, a circuit provided with a contact adapted to be closed by the motion of the lever when its tooth enters the notch, an electro-magnet in said circuit, a second circuit, a motor in the second circuit, a contact lever in the second circuit having an armature thereon adapted to be attracted by the electro-magnet when energized, said second lever being adapted to close the second circuit when the armature is attracted by the magnet, thereby starting the motor, a wheel connected with said motor to be operated thereby and having a notch in its circumference, the second lever having means thereon for entering said notch and stopping the wheel positively when the magnet is not energized and the wheel comes around to the position in which the notch registers with said means on the second lever, a talking element operated by said wheel, and means for transmitting variations produced in the talking element to a telephone transmitter in the form of words announcing the time.

8. In a device of the character described, the combination with a controlling clock having a second hand, an electric circuit having an electro-magnet therein controlled by operation of the second hand to energize the magnet once during each rotation of the second hand, a second circuit, a motor and electric light in the second circuit, an armature adapted to be attracted by the electro-magnet, movable means in the second circuit connected with said armature for closing the second circuit when the armature is attracted by the magnet, a shaft, a motor for operating the shaft, a wheel on said shaft having a notch in its circumference, means movable with said armature for resting on the circumference of said wheel and entering the notch when the wheel rotates to a certain position to stop the wheel, means for stopping the motor and extinguishing the light at the same time, a film adapted to be provided with means for announcing hours and minutes in order, a projector, said film passing between the electric light and the projector, a photo-electro cell in position to receive the rays of light from the projector, and a telephone receiving instrument connected to be controlled by the photo-electric cell.

9. In a device of the character described, the combination with a controlling clock having a second hand, an electric circuit having an electro-magnet therein controlled by operation of the second hand to energize the magnet at the end of each rotation of the second hand, a second circuit, a motor and electric light in the second circuit, an armature adapted to be attracted by the electro-magnet, movable means in the second circuit connected with said armature for closing the second circuit when the armature is attracted by the magnet, a shaft, a motor, gearing connecting the motor with said shaft for reducing

the speed, means for stopping the motor and extinguishing the light at the same time, a film adapted to be provided with means for announcing hours and minutes in order, a projector, said film passing between the electric light and the projector, a photo-electro cell in position to receive the varying rays of light from the projector, a primary circuit in which said photo-electric cell is located, a secondary circuit, a transformer for varying the secondary circuit with the primary circuit and a telephone receiving instrument in the secondary circuit.

In testimony whereof I have hereunto affixed my signature.

M. L. ZIMMER.