

(No Model.)

3 Sheets—Sheet 1.

C. S. GIBSON.
ELECTRIC TIME ALARM.

No. 498,710.

Patented May 30, 1893.

Fig. 1.

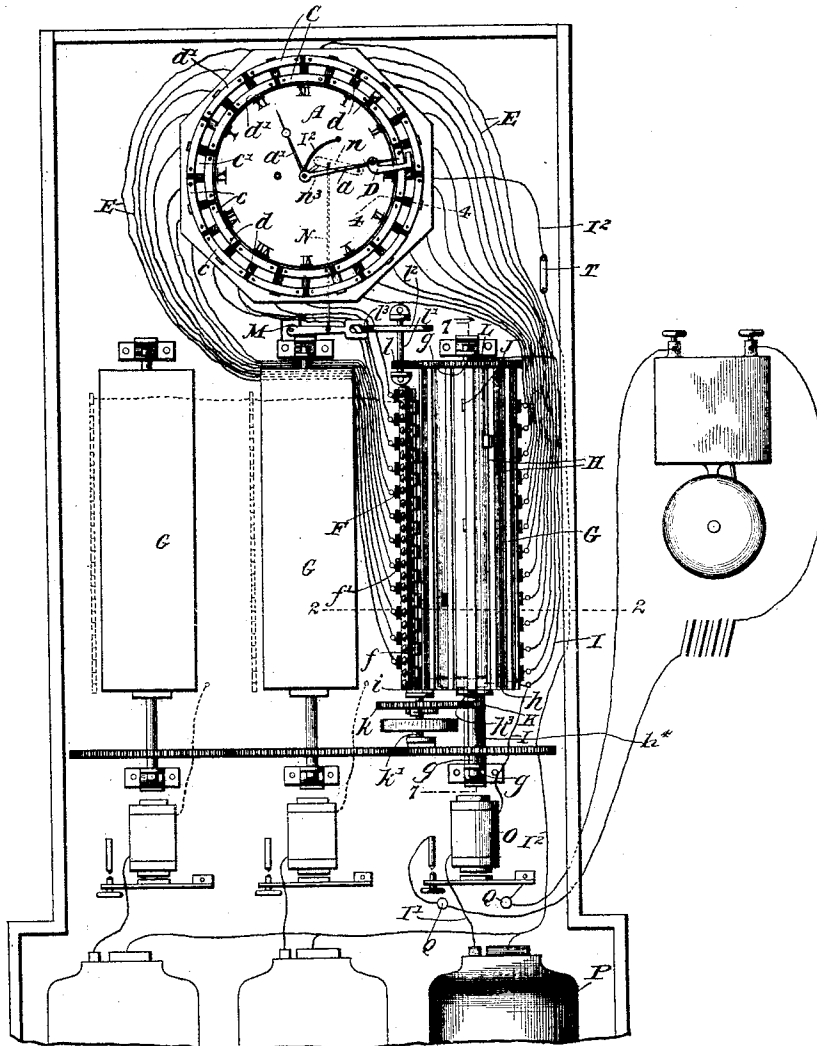
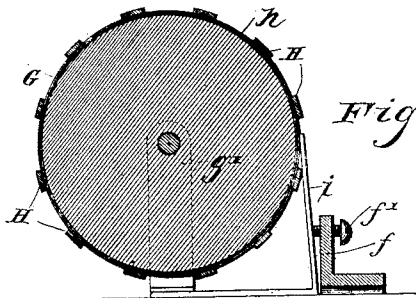


Fig. 8.



Witnesses;

J. M. Withered
L. O. Walhaug

By his Attorneys,

Inventor,
Chas. S. Gibson,

C. A. Snow & Co.

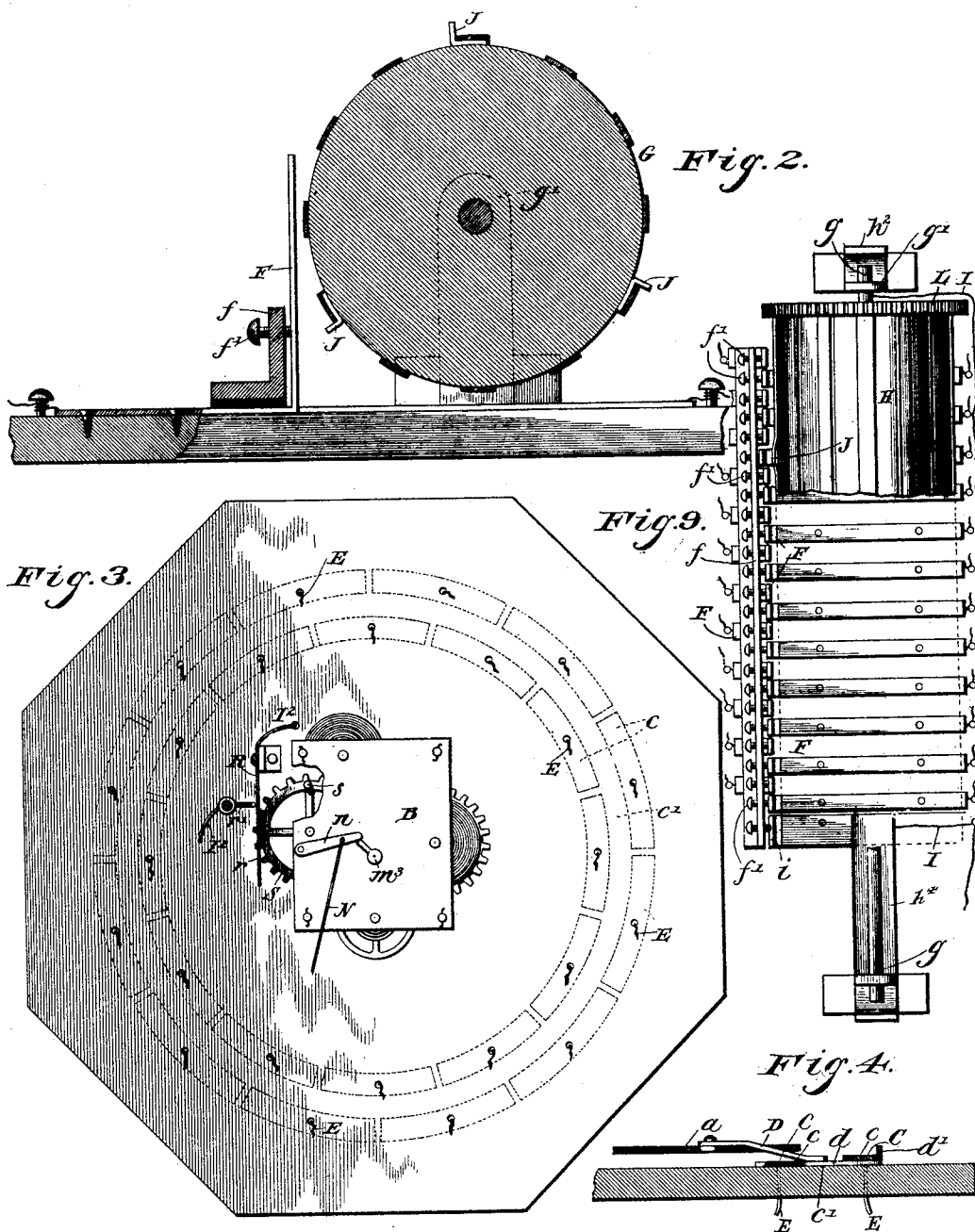
(No Model.)

3 Sheets—Sheet 2.

C. S. GIBSON.
ELECTRIC TIME ALARM.

No. 498,710.

Patented May 30, 1893.



Witnesses;

J. M. Withers
D. T. Walhauser

By his Attorneys,

C. A. Snow & Co.

Inventor
Chas. S. Gibson,

3 Sheets—Sheet 3.

No. 498,710.

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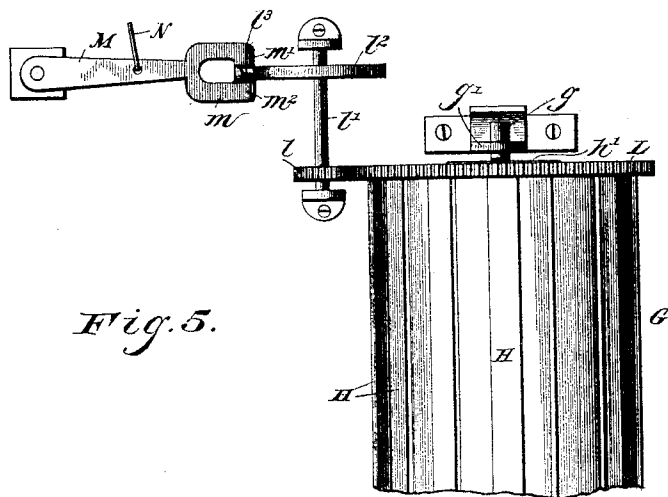


Fig. 5.

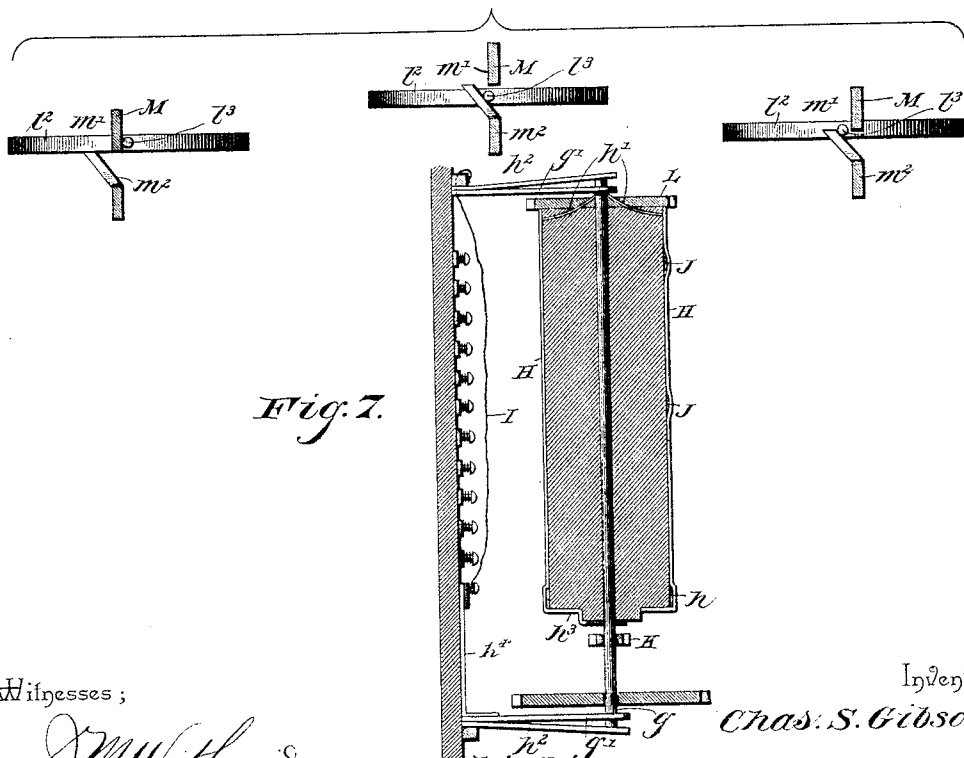


Fig. 7.

Witnesses ;

J. M. Withersaid.
W. O. Wolhaupter.

Inventor,

Chas. S. Gibson,

By *his* Attorneys,

Chas. Snow & Co.

UNITED STATES PATENT OFFICE.

CHARLES SCHUYLER GIBSON, OF SOUTH NEW BERLIN, NEW YORK.

ELECTRIC TIME-ALARM.

SPECIFICATION forming part of Letters Patent No. 498,710, dated May 30, 1893.

Application filed October 12, 1892. Serial No. 448,674. (No model.)

To all whom it may concern:

Be it known that I, CHARLES SCHUYLER GIBSON, a citizen of the United States, residing at South New Berlin, in the county of Chenango and State of New York, have invented a new and useful Electric Signal-Clock, of which the following is a specification.

This invention relates to electric signal clocks; and it has for its object to provide an improvement in clocks of this character whereby a system of electric bells can be rung at irregular intervals during one day or a part of a day, or during the entire week or part of the week as desired.

To this end the invention primarily contemplates a device wherein certain contacts on the face of the clock are rendered live or dead, to secure the proper signals and in order to especially adapt the signal clock for school purposes in indicating class recitation hours, and also in the railway service for dispatching trains, &c.

With these and other objects in view which fall within the scope of this invention, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

In the accompanying drawings:—Figure 1 is a front elevation or plan view of an electric clock system, constructed in accordance with this invention. Fig. 2 is a detail sectional view on the line 2—2 of Fig. 1. Fig. 3 is a rear elevation of the clock, showing the regulating circuit closer and the clock mechanism, together with the releasing device operating lever. Fig. 4 is a detail sectional view on the line 4—4— of Fig. 1. Fig. 5 is a detail plan of the upper end of one of the contact rollers and the releasing device connected therewith. Fig. 6 is a series of detail sectional views illustrating the operation of the roller releasing device. Fig. 7 is a detail sectional view on the line 7—7 of Fig. 1. Fig. 8 is a detail cross-section at the ring end of the rollers. Fig. 9 is an enlarged detail plan view showing the brushes and connections thereto.

Referring to the accompanying drawings, A represents the clock or dial face numbered in the usual manner and over the face of which travels the minute and hour hands *a* and *a'*, respectively, both of which are connected to and operated by an ordinary clock

mechanism B, secured to the rear face of the dial plate A and inclosed in any suitable frame, the entire operating mechanism hereinafter described used in connection with the clock, being designed to be mounted within a single frame or in any suitable relation to secure an operative result. Secured upon the dial plate and inclosing the numerals therebetween are the inner and outer circles of conducting plates C, each circle comprising a series of separate and independent plates *c*, secured at their ends to the dial, and insulated from each other so as to have separate and independent connections. There are preferably twelve plates in each circle corresponding to the number of hours on the dial, making twenty four plates in both circles, each plate of one circle being adapted to break joints with the plates of the opposite circle, so that there is no loss in the possible connections which might be made.

The two circles of conducting plates C, inclose there-between a circular path of non-conducting material *c'*, below which are printed the numerals, and in this path between the said circles is designed to travel the contact brush or foot D, secured to the minute hand, *a*, near its outer end and normally contacted with said non-conducting path. The brush or foot D, traveling between the circles of plates, is designed to contact and make connection with the contact plugs *d*, arranged upon the face of the dial and inserted beneath the said plates so as to project into the path of the hand brush, and said plugs which are provided with flanged finger ends *d'*, are designed to be slid under the conducting plates *c*, at the several hours and fractions of the hour, that it is designed to cause the signal or signals to sound, but as hereinafter described, some of said plugs are designed to be live during one hour, while others are dead during the same hour, and vice versa, during another hour.

Each of the conducting plates *c*, of each circle has connected therewith a separate circuit wire E, which leads from the clock dial to its contact brush F, arranged in series at a suitable point adjacent to the clock. The metallic contact brushes F, are fixedly secured at one end to the base frame supporting the entire mechanism, while their other

ends project outward from the base frame in a line with each other at one side of the screw-strip *f*. The said screw-strip *f*, is also secured to said base and accommodates a series of regulating screws *f'*, the pointed ends of which work against the projecting spring ends of the twenty four spring contact brushes *F*, which are separately connected by the wires *E* to a particular conducting plate upon the face of the dial of the clock, and therefore in electrical connection therewith. The said brushes *F*, project alongside of and in close proximity to one of the series of connecting or circuit closing rollers *G*, illustrated in Fig. 1 as arranged side by side, in a series, in relation and connection with a similar set of contact brushes such as those just described, but since one roller is sufficient to operate one system of bells, I will confine my description to one roller and the connections for one roller.

The contact roller *G*, is constructed of wood or other suitable non-conducting material, and is provided with the metallic journal ends *g*, working in the bearing arms or brackets *g'*, arranged at each end thereof and projecting outwardly from the base to which the device is secured. The said roller *G*, is preferably divided into twelve equal parts corresponding to the hours on the clock dial, and such divisions are indicated by a longitudinal series of metallic connecting plates *H*, electrically connected at one end by the continuous connecting ring *h*, while to the other ends of said strips or plates are connected the short wires *h'*, electrically connecting these ends of said strips or plates to the upper metallic journal of the roller, both of which slightly projects through the bearing arms or brackets *g'*, and contact with the end spring contact plates *h²*, arranged alongside of both brackets in order to secure a perfect electrical connection from the metallic journals to the single circuit wire *I*, connected directly and by the end connecting plates *h⁴* with said end plates and with the friction and contact brush *i*. The said friction and contact brush *i*, is arranged in the line with the series of brushes *F*, and contacts with the continuous connecting ring *h*, at one end of the roller, in order to retard the movement of the roller when rotating, and also to insure the proper connection from the roller to the wire *I*, forming a part of the circuit to be described. At the lower end of the roller opposite the short wires *h'*, one of the plates *H*, is extended as at *h³*, and connects with the lower metallic journal to secure the three connections for the wire *I*, as described.

The contact roller *G*, as described, travels in close proximity to the brushes *F*, and therefore normally out of contact therewith. Said roller presents the strips or plates *H*, to the brushes *F*, one at a time, but there is no connection between the same unless in that particular plate roller plugs *J*, are inserted. The said roller nodes *J*, are constructed similar to

the dial plugs *d*, and are adapted to have their flanged ends contact with that brush directly opposite the same.

It will be readily understood that according to the fractions of the particular hour at which it is desired for the clock to signal, roller plugs are inserted in the connecting strip or plate corresponding to that hour, so that such plugs will connect in the complete circuit only those brushes which are connected to the dial plugs, which are to be in the circuit during that hour, thereby rendering all other dial plugs inactive during the same hour. The next hour is supposed to have different intervals at which the clock is to signal, and therefore the device is arranged so that at the end of each hour the roller automatically revolves one twelfth of a revolution, in order to present a new connecting strip or plate, and therefore a differently arranged set of roller contact plugs, which closed the circuit with certain other dial plugs, the purpose of which will at once suggest itself.

In order to provide for the hourly partial revolution of the connecting enlivening roller *G*, the lower spindle end thereof is provided with a pinion *K*, with which meshes the gear wheel *k*, mounted upon the spring actuated shaft *k'*, wound up in any suitable manner, and normally tending to rotate such roller, which is designed to be held stationary for a whole hour and at the end of that hour to be released sufficiently long to make its one twelfth of a revolution. To the upper end of the roller or the upper spindle thereof, is secured the large gear wheel *L*, meshing with an adjacent small pinion *l*, mounted upon a short shaft *l'*, which carries the stop and releasing wheel *l²*, having projecting from its periphery the stop and releasing pin *l³*, that is adapted to engage and disengage the releasing lever *M*. The said releasing lever *M* is pivoted at one end to a suitable point of attachment above the roller, and is adapted to be lifted and dropped once every hour. The said releasing lever *M*, is provided at the free end thereof with the head *m*, having the upper and lower overlapping tongues *m'* and *m²* respectively, said tongues, though overlapping, being out of contact with each other to leave an escape opening for the stud or pin of the wheel *l²*. A wire or rod *N*, is connected to the pivoted lever *M* and to the lifting lever *n*, pivoted to a suitable point of attachment back of the clock mechanism *B*, and having its free end lying in the path of the lifting arm *m³*, secured to the rear end of the minute hand shaft, so that said arm will come in contact with the lifting lever once an hour, to raise and then suddenly drop the same to release the wheel *l²* from the releasing lever, and allow it to make one revolution, which permits the spring actuated connecting roller to revolve one twelfth of a revolution. Normally, during the hour, the pin *l³*, rests against one side of the upper tongue *m'*. At the end

of the hour when the lever *m* is raised, the upper tongue is raised above the pin so that the same drops onto the lower pin. Now, when the said lever is dropped, the pin or stud of the wheel is in a position to pass through the opening between the two tongues, so that the wheel I^2 can make its revolution, after which the pin or stud again comes in contact with the upper tongue.

The circuit wire *I*, from the connecting roller, is preferably connected to the relay *O*, which connects by the wire *I'*, with the battery *P*, while the clock circuit is completed through the wire I^2 to the minute hand *a*, of the clock, which hand completes the circuit through the plugs as already mapped out. The relay is inserted in order to cut in a separate battery or series of batteries for the electric bells, and the relay wires lead to the binding posts *Q*, to which are connected any suitable bell system such as that illustrated.

Now, in order to provide for regulating the duration of the ringing of the bells, I interpose in the circuit wire I^2 , a regulating circuit closer *R*, such as is fully illustrated in Fig. 3 of the drawings. The circuit closer *R*, comprises the separated spring wire terminals *r* and *r'*, respectively, normally out of contact with each other and adapted to be pressed into contact as long as it is desired to have the bells ring. One of the terminals *r*, is arranged adjacent to a wheel of the clock mechanism, as *S*, having a known revolution, (one minute,) and this wheel is provided with a projecting stud *s*, which during an interval or at least during a part of the minute, is designed to press the terminal *r*, in contact with the terminal *r'*, and hold it in such contact until the same has passed such terminal.

The duration of contact of the circuit closing terminals is regulated by separating the same different distances apart, as will be readily apparent. A switch *T*, may be interposed in the circuit, if so desired.

Although one roller and its connections have been described, nevertheless, it will be readily seen that the system can be greatly enlarged by employing a series of such rollers *G*, as illustrated in Fig. 1 of the drawings, such rollers all being geared together and operated by the same mechanism, and in such arrangement each relay is designed to cut in a different system of bells, so that several different signals can be sounded at the same time if so desired, which will be easily understood to those skilled in the art.

The operation of the clock system has already been outlined in the description of the several parts thereof, the circuits being clearly illustrated in the drawings. As will be now readily understood, when the brush of the minute hand comes in contact with one of the dial plugs, while the same is thereon, the regulating circuit closer will close the circuit and cause the alarm to be sounded if that particular dial node is in the circuit; that is if it has a corresponding roller plug in contact with its

own brush, as already described. This operation is repeated at irregular intervals, whenever the minute hand brush contacts with a live dial node. The periods of signaling are different from the plugs on the dial being cut in the circuit once an hour by the mechanisms herein described and set forth.

It is now thought that the operation and advantages of the herein described clock system will be obvious to those skilled in the art without further description, and it will of course be understood that all modifications falling within the scope of the invention are reserved to my option.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an electric signal clock, the combination with the clock; of the concentric rows of separated conducting plates breaking joints, flanged dial plugs adapted to be removably inserted under said plates and to project into the path inclosed between the rows, the clock minute hand having a spring brush or foot adapted to travel between said rows of plates and over the projecting ends of the plugs, an automatic intermittently revolving circuit-closing roller, circuit wires leading from each of said separated conducting plates to the circuit closing roller, and a bell circuit connected with the hand and said circuit closing roller, substantially as set forth.

2. In an electrical signaling clock, the clock dial plugs removably arranged upon the face of the clock, the minute hand adapted to connect with the dial plugs, plug brushes arranged at a suitable point and connected separately by wires with separate dial plugs, an intermittently revolving spring-actuated connecting or circuit closing roller having roller shifting plugs adapted to contact with certain brushes to close the circuit with certain dial plugs, an independent automatic stop and releasing device for said roller, and electrical connections from the roller and the clock hand to a bell circuit, substantially as set forth.

3. In an electric signaling clock, the clock, dial plugs removably arranged upon the dial of the clock, the minute hand traveling over said plugs, a circuit closing roller mounted for revolution, and having a longitudinally disposed parallel series of electrically connected metallic connecting plates, flanged roller plugs adapted to be removably inserted under said separate connecting strips or plates in any shifted position, means for partially revolving said roller hourly, a series of adjustable plug brushes arranged in a line in close proximity to the roller at one side of the same and adapted to contact with the roller plugs under the plate facing the brushes, separate wires leading from each brush to a separate dial plug, and electrical connections from the electrical connections of said roller plates and the clock hand to a bell circuit, substantially as set forth.

4. In an electrical signaling clock, the com-

5 bination with the clock, the dial of which is
 provided with a series of contact plugs mak-
 ing connection with the minute hand; of a
 circuit closing roller having a longitudinal
 10 series of connecting strips or plates connected
 at both ends with the metallic journals there-
 of, an auxiliary connecting ring connecting
 said strips at one end, an adjustable com-
 15 bined friction and contact brush adapted to
 contact with said connecting rings, wires con-
 necting the metallic journals of the roller and
 said brush in a single connection, roller plugs
 adapted to be inserted under the metallic
 20 strips or plates, adjustable plug brushes ar-
 ranged adjacent to the roller and adapted to
 contact only with plugs thereon, separate cir-
 cuit wires leading from each brush to sepa-
 rate dial plugs, means for actuating said roll-
 er, means for releasing the roller hourly for a
 25 partial rotation, and a bell circuit completed
 through the hand of the clock and the con-
 nections of the roller, substantially as set
 forth.
 5. The combination with a signaling clock
 30 system and the circuit closing roller thereof
 having a gear wheel at one end and means
 for rotation at the other end; of a short shaft
 having a small pinion meshing with said gear
 wheel and a combined stop and releasing

35 adjacent releasing lever pivoted at one end and
 having at its other free end upper and lower
 overlapping tongues leaving an escape space
 therebetween for the pin or stud of said
 wheel, which normally bears against the up-
 per tongue above the escape opening, a lift-
 ing lever connected with said releasing lever,
 and a lifting arm secured to the minute hand
 shaft of the clock and adapted to raise and
 drop said lifting lever to raise and drop the
 40 releasing lever, substantially as set forth.

6. In an electric signaling system, the com-
 bination, with the bell and clock circuits elec-
 trically connected, and a wheel of the clock
 having a single projecting stud; of a circuit
 45 closer included in the clock circuit and com-
 prising normally separated spring wire ter-
 minals, one of which lies alongside of the
 studded wheel and is adapted to be engaged
 by said stud to close the circuit with the other
 50 terminal and regulate the duration of the
 sounding of the signal, substantially as set
 forth.

In testimony that I claim the foregoing as
 my own I have hereto affixed my signature in
 the presence of two witnesses. 55

CHARLES SCHUYLER GIBSON.

Witnesses:

CLARK JOHNSON,
FRANK LAMB.