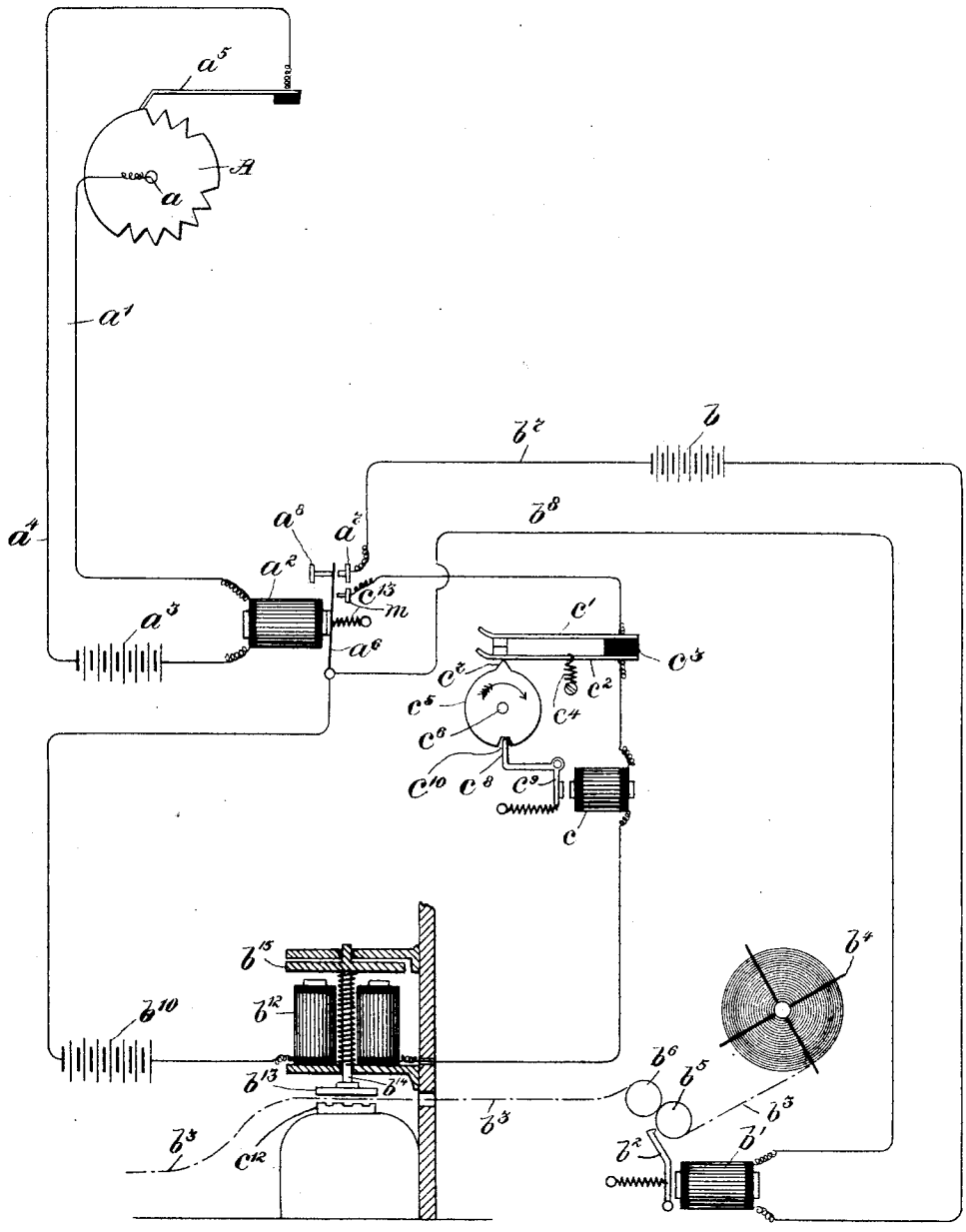
(No Model.)

H. A. CHASE.

SIGNAL TIMING APPARATUS.

No. 481,613. Patented Aug. 30, 1892.



WITNESSES.

L. Henry Marsh.

S. C. Fearing

INVENTOR.

Henry A. Chase

By Jas. H. Churchill

Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HENRY A. CHASE, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO ALBERT WATTS, OF SAME PLACE.

SIGNAL-TIMING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 481,613, dated August 30, 1892.

Application filed May 11, 1892. Serial No. 432,615. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. CHASE, residing in Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Signal-Timing Apparatus, of which the following description, in connection with the accompanying drawing, is a specification, like letters on the drawing representing like parts.

This invention relates to a signaling system, and has for its object to provide a novel construction and arrangement of apparatus for recording the signals and distinguishing the time of the reception of the said signals, as will be described.

In accordance with my invention a message-recording apparatus, which may be of any usual or well-known form of registering mechanism—such as the Morse register—is located in a local circuit controlled by a relay included in the main-line circuit containing the signal-transmitting apparatus. The relay, in accordance with my present invention, also directly controls an independent local circuit, in which is included the electro-magnets of a time-stamp, which may be of any usual or well-known construction—such, for instance, as shown in United States patent granted to J. C. Hinchman, dated October 10, 1882, No. 265,808. The local circuit of the time-stamp has included in it a second electro-magnet governing the action of a circuit-controller, which co-operates with normally-closed circuit-terminals of the local circuit containing the time-stamp magnets, the circuit-terminals being normally held closed by the said circuit-controller until its electro-magnet is energized, as will be described, whereupon the normally-closed circuit-terminals are separated to open the local circuit of the time-stamp at the said circuit-terminals. The circuit-controller, which is preferably made in the form of a disk or wheel having a projection or tooth upon its periphery, is actuated by a motor mechanism, which may be a spring or a clock mechanism of any usual or well-known construction, the said disk in its normal position having its tooth or projection in engagement with one of the normally-closed circuit-terminals to bring the said circuit-terminal into engagement with its co-operating circuit-terminal and thereby hold the local circuit of the time-stamp closed at that particular point until the said local circuit is closed by the armature of the relay.

The circuit-controlling disk or wheel is adapted to be rotated by its motor mechanism when released by the armature of its governing electro-magnet, and its actuating-motor mechanism may be controlled so that any desired period or length of time may elapse while the controlling-disk is making a complete revolution, during which time the normally-closed circuit-terminals remain open and the time-stamp thereby rendered inoperative, irrespective of the closures of the local circuit by the armature of the relay.

The particular features in which my invention consists will be pointed out in the claims at the end of this specification.

The drawing represents in diagram a sufficient portion of a signaling system to enable my invention to be understood.

A represents a break-wheel of a signal-transmitting apparatus, which may be of any usual or well-known construction—such as commonly used in fire and police signaling systems—the wheel A being mounted upon a shaft a, which in practice is rotated by a motor mechanism of any usual or well-known construction, the said wheel, as herein represented, having connected to it one wire a' of a main-line circuit including a relay-magnet a^2 and connected to one pole of a main-line battery a^3, the other pole of which is connected by a wire a^4 to a pen or brush a^5, co-operating with the break-wheel A.

The break-wheel A is provided on its periphery with a series of notches or teeth. (Herein shown as representing the number "36.")

The relay A^2 is provided with an armature a^6, co-operating with a back stop a^7, and, as herein represented, with a front stop a^8.

The main-line circuit is represented as a normally-closed circuit, and the armature a^6 of the relay a^2 is attracted against its front stop a^8.

In accordance with my invention the armature a^6 of the relay a^2 governs two independent local circuits, one of which includes a local battery b, and a registering mechanism

of any usual or well-known construction and herein shown as an electro-magnet b', controlling the operation of a marking pen or stylus b^2, adapted to operate upon a strip of paper b^3, normally wound upon a reel b^4, the said paper passing between guide-rolls b^5 b^6.

The local circuit containing the battery b and the electro-magnet b' has one of its wires, as b^7, connected to the back stop a^7 and its other wire b^8 connected to the armature a^6. The second local circuit controlled by the armature a^6, in accordance with my invention, includes a local battery b^{10} and the electro-magnets b^{12} of the time-stamp, which may be of any usual or well-known construction, such as shown in the patent referred to, the said time-stamp being herein represented as provided with a movable presser b^{13}, connected by the rod b^{14} to the armature b^{15} for the electro-magnets b^{12}. The local circuit of the battery b^{10} also includes an electro-magnet c and normally-closed circuit-terminals c' c^2, herein represented as spring-arms mounted upon an insulating-block c^3, the circuit-terminal c^2 being adapted to be moved away from the terminal c' by a spring c^4. The circuit-terminals c' c^2 are normally closed and are held in their closed position by a mechanical circuit-controller, represented as a disk or wheel c^5, mounted on a shaft c^6 and provided on its periphery with a tooth or projection c^7, which, in the normal position of the disk c^5, engages the circuit-terminal pen c^2 and forces it into contact with the circuit-terminal pen c'.

The rotary disk c^5 is adapted to be rotated by a motor mechanism, which may be a spring or clock mechanism of any usual or well-known construction and not herein shown. The disk c^5 is held in its normal position and prevented from rotating, as herein shown, by an arm c^8, fast to the armature c^9 of the electro-magnet c, the arm c^8 entering a notch c^{10} in the periphery of the disk c^5.

The paper strip b^3 is fed between the presser b^{13} of the time-stamp and the time-indicating surfaces or dials (not herein shown, but represented by c^{12}) and the time is imprinted upon the strip b^3, as will be described.

As represented in the drawing, the local circuit of the register is normally open between the armature a^6 and its back stop a^7, and the local circuit containing the time-stamp is also normally open between the said armature and a second stop m, to which one wire, as m' of the time-stamp local circuit, is connected, and is complete throughout the rest of the circuit.

When the signal is transmitted from the apparatus or box containing the signal-transmitting wheel or surface A, the armature a^6 of the relay a^2 is withdrawn by its retractile spring c^{13} at each break or interruption in the main-line circuit caused by a tooth in the break-wheel A, and each impulse or break in the main-line circuit effects a closure of the two local circuits between the armature a^6 and the back stops a^7 and m, and each closure of the local circuit of the battery b, containing the register, produces an imprint upon the strip b^3, so that the complete signal indicated by the teeth or notches in the break-wheel A is reproduced on the recording-strip b^3.

When the armature a^6 is brought in contact with its back stop m at the first interruption or break in the main-line circuit, the local circuit of the battery b^{10}, containing the time-stamp magnet b^{12} and the electro-magnet c, is closed and the said magnets are energized. The electro-magnet b^{12} when energized attracts its armature b^{15} and causes the time indicated by the dials or time-indicating surfaces c^{12} to be imprinted upon the recording-strip b^3, and at the same time the electro-magnet c attracts its armature c^9 and withdraws the detent-arm c^8 from engagement with the rotary disk c^5, thereby permitting the latter to be revolved in the direction indicated by the arrow thereon by its motor mechanism. When the arm c^8 is withdrawn from engagement with the rotary disk c^5, the tooth c^7 of the said disk is carried away from and out of contact with the movable circuit-terminal c^2, and the latter is withdrawn by its spring c^4 away from the circuit-terminal c', thereby opening the local circuit of the battery b^{10} between the said terminals. The local circuit of the time-stamp magnet b^{12} remains open until the disk c^5 has made a complete revolution, as herein shown, and the tooth c^7 has been again brought into engagement with the movable terminal c^2 to bring the latter into engagement with its co-operating terminal c'.

The speed of rotation of the disk c^5 may be governed by regulating its motor mechanism so that any desired length of time may elapse before the said disk has made a complete revolution, which time, forsake of illustration, may be supposed to be one minute. It will thus be seen that during the minute the circuit-terminal c^2 is removed from engagement with the circuit-terminal c' the local circuit containing the time-stamp magnets b^{12} remains open between the said terminals and may be closed by the armature a^6 being withdrawn into contact with its back stop a^7 without affecting the operation of the time-stamp, and consequently a number of signals may be transmitted and recorded upon the tape b^3 before the local circuit is again closed by the tooth c^7 acting on the circuit-terminal c^2.

With the apparatus in the condition represented in the drawing the time is stamped at the first impulse or break of the main-line circuit, and will not be again stamped until the circuit-terminal c^2 has been brought into engagement with the circuit-terminal c' by the rotary mechanical circuit-controller, and the next operation of the time-stamp may be effected by an impulse or break in the middle of a signal transmitted by the wheel A, or by any other break or impulse, according to which impulse is being transmitted when the

rotary circuit-controller has been restored to its normal position.

I have herein shown the rotary circuit-controller or disk c^5 as provided with one tooth, which requires that the disk c^5 shall make a complete revolution before the local circuit is again closed between the terminals c' c^2; but it is evident that the disk c^5 may be provided with any desired number of teeth c^7, according to how long it is desired the local circuit should be open between the terminals c' c^2 before being again closed.

I claim—

1. In a signaling system, the combination of the following instrumentalities, viz: a main electric circuit, a signal-transmitting mechanism included therein, a relay or receiving mechanism a^2 in said circuit, a local circuit controlled by said relay, a register in said local circuit, a time-stamp provided with an electro-magnet, a second local circuit controlled by the relay a^2 and independent of the register local circuit and in which the electro-magnet of the time-stamp is located, two sets of circuit-terminals for the local circuit of the time-stamp, one set of circuit-terminals being controlled by the relay, a rotary mechanical circuit-controller to govern the operation of the second set of circuit-terminals, and an electro-magnet to govern the operation of the said mechanical circuit-controller, substantially as described.

2. In a signaling system, the combination of the following instrumentalities, viz: a main electric circuit, a signal-transmitting mechanism included therein, a relay or receiving mechanism in said circuit, a local circuit controlled by said relay, a registering mechanism in said local circuit, a second local circuit controlled by the relay, a time-stamp having its electro-magnet included in said second local circuit, circuit-terminals for said local circuit, a circuit-controller to operate said circuit-terminals, and an electro-magnet in the local circuit of the time-stamp magnets to govern the operation of the said circuit-controller, substantially as described.

3. In a signaling system, the combination of the following instrumentalities, viz: a main electric circuit, a signal-transmitting mechanism included therein, a relay or receiving mechanism in said circuit, a local circuit containing a register-operating magnet b', a recording strip or tape upon which the signal transmitted is received, a second local circuit controlled by the said relay, time-operating magnets located in said local circuit, normally-closed circuit-terminals in said local circuit, a circuit-controller co-operating with the said circuit-terminals to hold the same normally closed, and an electro-magnet in the local circuit of the time-operating magnets governing the operation of the circuit-controller, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY A. CHASE.

Witnesses:
JAS. H. CHURCHILL,
SADIE C. FEARING.