

(No Model.)

2 Sheets—Sheet 1.

T. F. GAYNOR.

COMBINED ELECTRIC TIME STAMP AND SIGNAL DEVICE.

No. 509,217.

Patented Nov. 21, 1893.

Fig. 1.

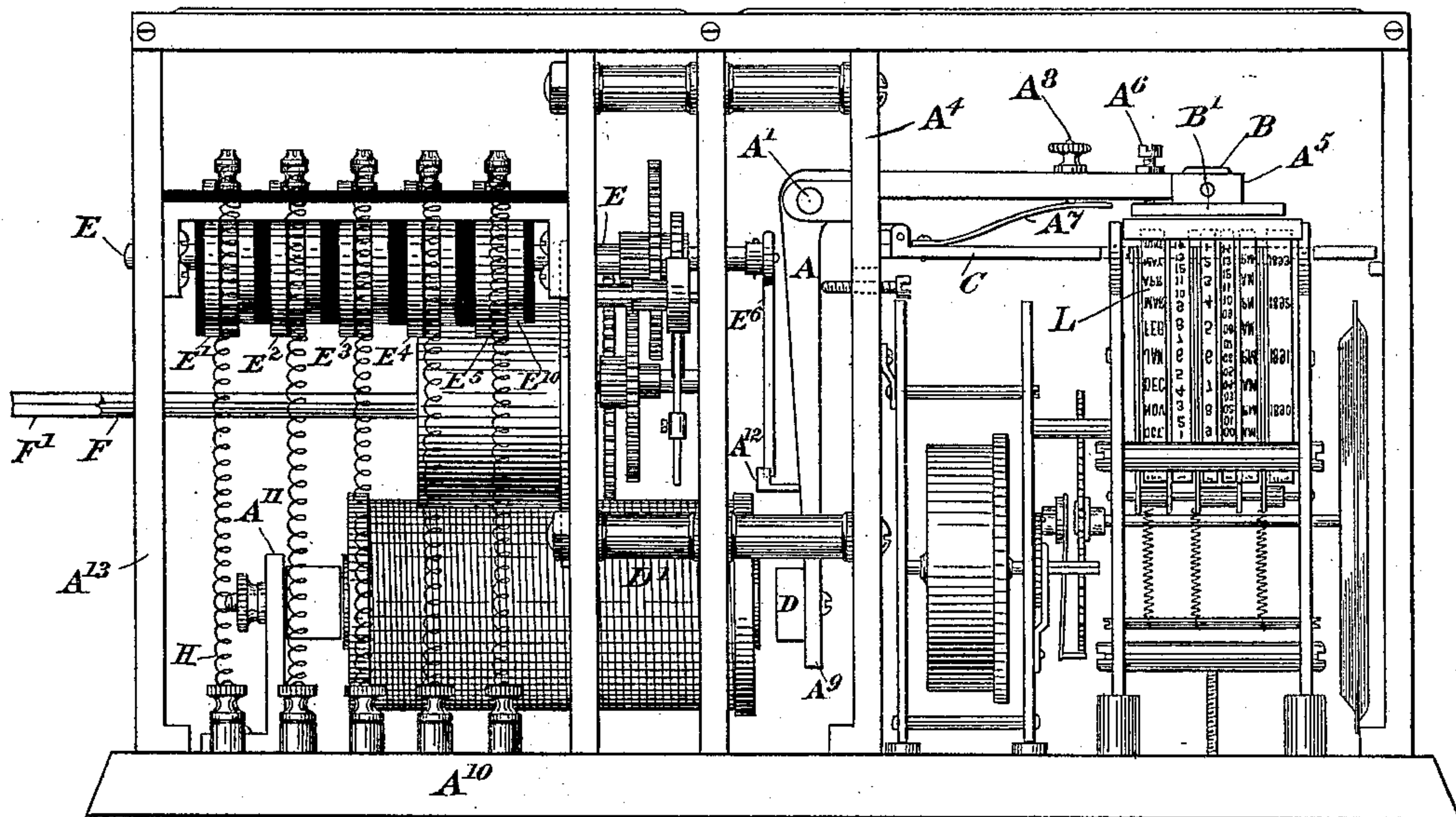
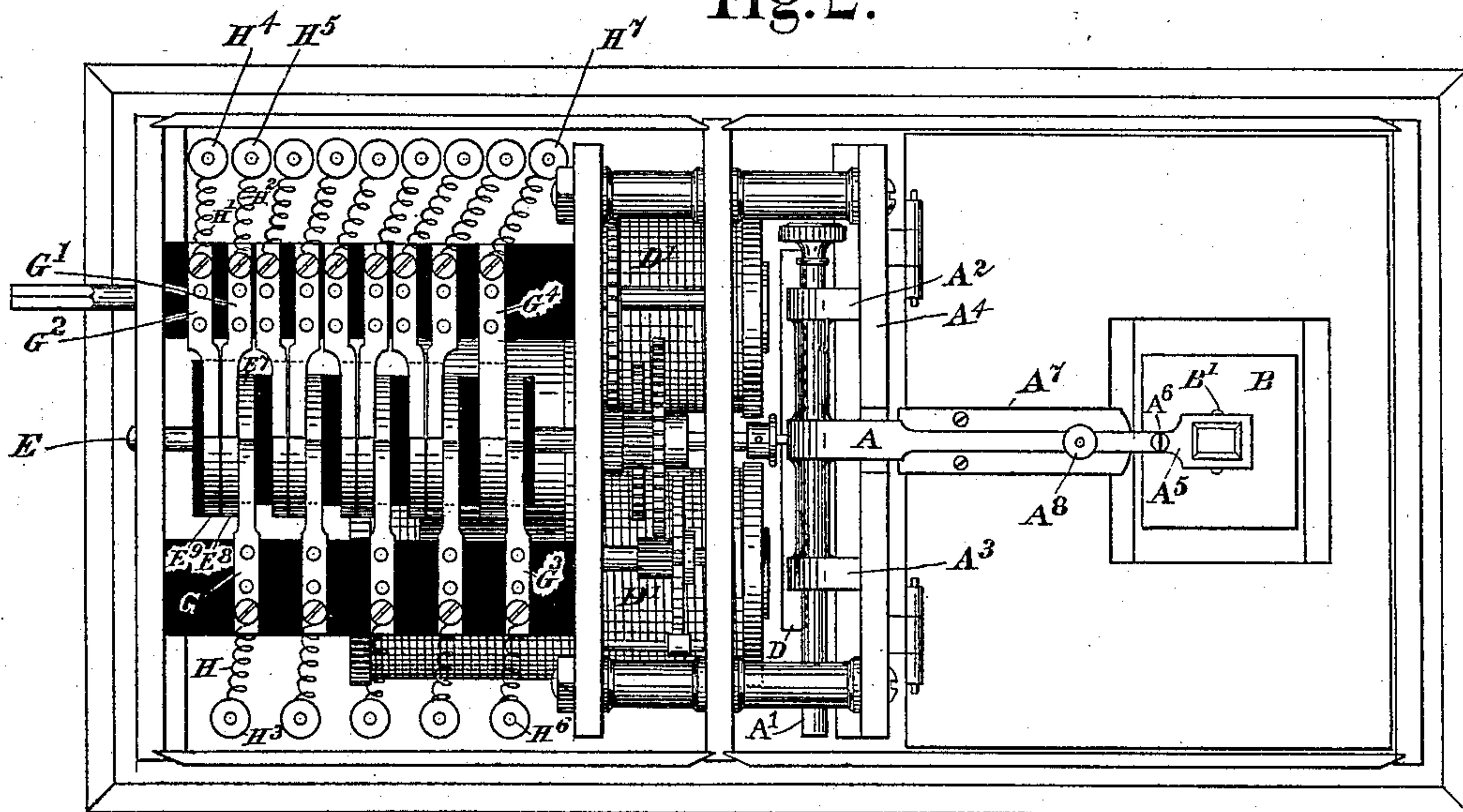


Fig. 2.



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(No Model.)

2 Sheets—Sheet 2.

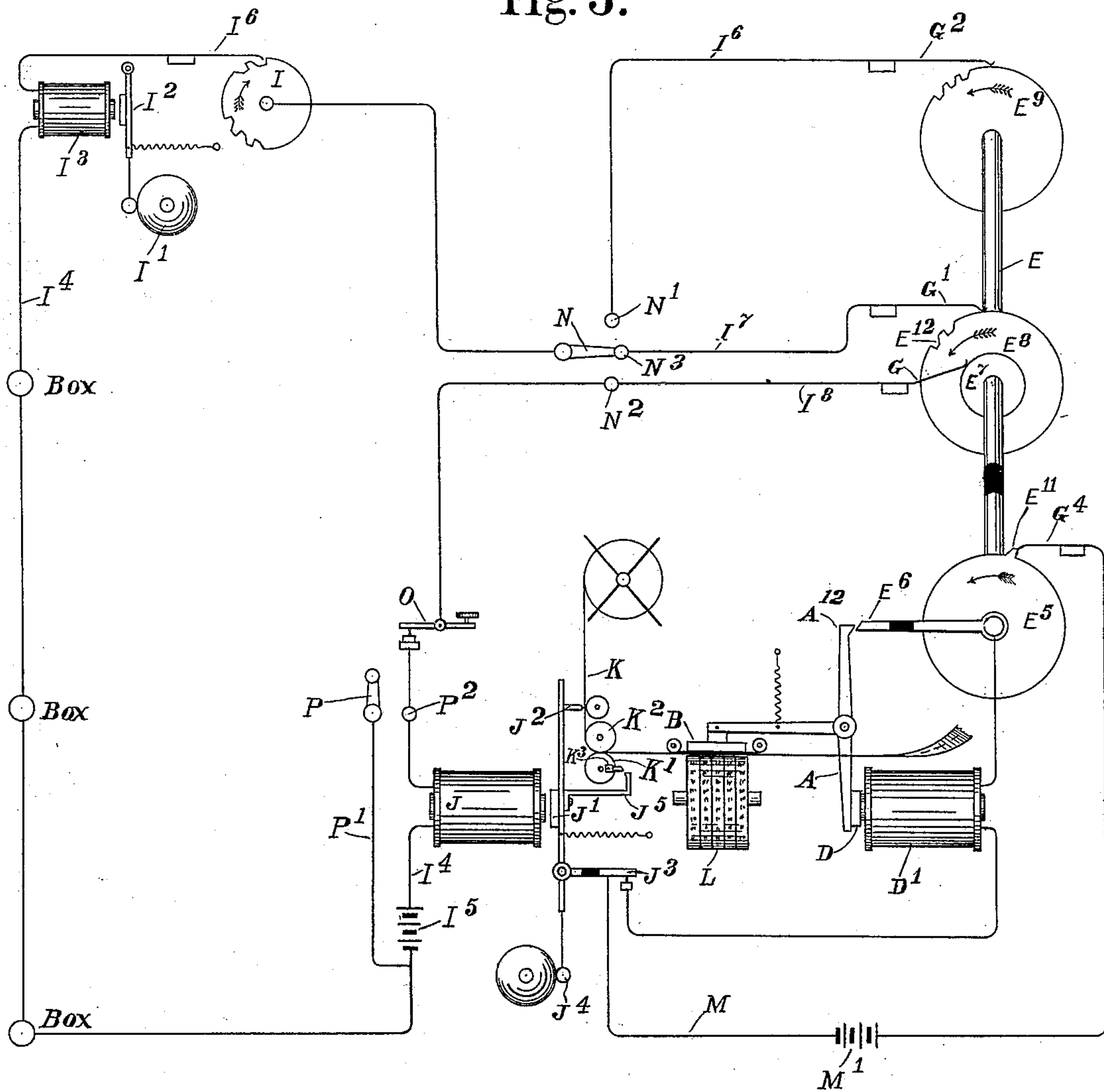
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Fig. 3.



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UNITED STATES PATENT OFFICE.

THOMAS F. GAYNOR, OF LOUISVILLE, KENTUCKY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE NEW GAYNOR ELECTRIC COMPANY, OF SAME PLACE.

COMBINED ELECTRIC TIME-STAMP AND SIGNAL DEVICE.

SPECIFICATION forming part of Letters Patent No. 509,217, dated November 21, 1893.

Application filed March 7, 1891. Serial No. 384,172. (No model.)

To all whom it may concern:

Be it known that I, THOMAS F. GAYNOR, of Louisville, county of Jefferson, State of Kentucky, have invented certain new and useful
5 Improvements in a Combined Electric Time-Stamp and Signal Device, of which the following is a specification, taken in connection with the accompanying drawings, in which like letters represent like parts.

10 The invention relates more particularly to municipal signal systems in which it is desirable to stamp upon a paper tape of a register mechanism adapted to record the signals transmitted from an outlying signal box
15 mechanism the time of the reception of such signals.

This invention also relates to that class of automatic signal devices which are adapted to automatically attract the attention of a person who shall send in a signal from a signal box mechanism.
20

The object of my invention is to simplify the design and construction of such devices and my invention therefore consists in combining a stamping machine and an automatic
25 multiple circuit breaking machine in such a manner as that a single electro-magnet placed in electric connection with a relay circuit changing device in a signal circuit will not
30 only stamp the time upon the tape of the register mechanism but will also cause itself to be cut out of circuit during the remainder of the time during which a signal is being registered on the tape after it has made a single
35 impression, and furthermore will cause the circuit breaking machine to start and automatically give the required "attention" signal upon the signal mechanism of the outlying signal box after the signal sent in from
40 the same has been completed.

The invention also consists of such a novel combination of register mechanism and circuit mechanism as is required to make the whole device operative and complete.

45 Figure 1. represents a front view of the machine. Fig. 2. represents a top view of Fig. 1. Fig. 3. represents a diagram of the connections between the outlying box mechanism and the several parts of the combined
50 time stamp and automatic signal mechanism

together with the arrangement of the whole mechanism with relation to the register mechanism.

This automatic signaling mechanism is sometimes designated as an "answer back" 55 device because after a person has sent in a signal as for instance,—a police officer making his report signal in going his rounds, the machine, if set to do this, will, after the "report" signal has come in, signal to him an
60 answer back that he is desired to remain at the signal box until special instructions may be given him or correspondence held from the central office. This part of the invention will therefore be referred to as the "answer-
65 back" machine.

The machine as will be noted by reference to Figs. 1. and 2. consists of two sections the right hand one containing a series of type wheels upon the peripheries of which the
70 characters representing the minute, hour, a. m. and p. m. day of the month, name of the month, and year are placed and the whole mechanism being moved by a suitable clock work mechanism in the manner of the well
75 known time stamping machines and needing no further description, as no claim is made for the clock work or wheel mechanism shown and as any other suitable time stamp mechanism can be used as well as the one herein
80 shown and described.

In the left hand section of the machine the "answer-back" mechanism is shown as consisting of a multiple circuit breaking wheel upon which the contact springs of the several
85 (four) outlying box circuits converge, and which is driven by a train of wheel work and having a detent lever mechanism somewhat similar to the usual wheel work of signal boxes. Between the "answer-back" mech-
90 anism and the time stamp mechanism a bell crank lever A. is placed which is trunnioned by means of the shaft A'. in two lugs A². A³. in one of the vertical frame plates A⁴. of the machine. Upon the upper end A⁵. of the lever A. a presser B. is secured by means of the
95 pin B'. which is adapted to press the tape of the register against the character wheels of the time stamp mechanism and thereby make the required time imprint on the paper. An 100

inked ribbon passes between the wheels and the presser which may be either under or over the paper according as it may be desirable to have the imprint on the upper or under surface of the tape. The screw A⁶ in the lever A. adjusts the surface of the presser to come squarely against the type wheels. A spring A⁷ which is secured to the hinged cover C. for the type wheel mechanism presses against the under side of the lever A. and thereby keeps the presser B. clear of the type wheels when the machine is in its normal condition. The tension of the spring A⁷ is regulated by the tension screw A⁸ in the lever A. Near the lower end A⁹ of the lever A. an armature D. is secured which is adapted to be energized by the magnet D'. which is placed beneath the "answer back" mechanism and which is secured to the base A¹⁰ of the machine by means of the standard A¹¹.

The circuit wheel shaft E. upon which the insulated circuit wheels E'. E². E³. E⁴. E⁵. are mounted has an escapement lever E⁶. secured thereto. A detent A¹². projects from the lever A. in such a manner as to arrest the rotation of the escapement lever E⁶. and consequently the circuit wheel shaft mechanism when the magnets are demagnetized, as shown in the figures. The circuit wheel shaft E. is provided with a train of wheel work having a clock spring motor mechanism which is wound up by means of a key through the shaft F. the end F'. of which is squared and projects through the end plate A¹³. of the machine. By this arrangement the detent A¹². as has already been stated arrests the rotation of the circuit wheel shaft E. when the armature is in its normal or open circuit condition, but when the armature is drawn forward to the poles of the magnets in response to an electric current sent through the latter the detent A¹². passes to the left of and clear of the escapement lever E⁶. which allows the circuit wheel shaft E. to rotate which it will continue to do until again arrested in its rotation by the dropping back again of the armature mechanism into its normal or open circuit position. This forward movement of the armature also causes the lever A. to bring the presser B. down upon the tape and against the type wheels and thereby cause an impression to be made upon the paper. The circuit wheels are insulated from the shaft and from each other and each circuit wheel has a set of insulated contact springs G. G'. G². provided for it which form circuit terminals for an outlying signal box circuit. The periphery of each of the circuit wheels is divided into three sections E⁷. E⁸. E⁹. upon each one of which, a contact spring makes contact. The section E⁷. which is a trifle smaller in diameter than the other parts of the circuit wheel is perfectly smooth and a spring G. makes a constant contact at all times during the rotation of the wheel but the sections E⁸. and E⁹. have notches in their peripheries corresponding to the signal that is desired to be

transmitted similar to the usual form of closed circuit wheels. See Fig. 3. Circuit connection is established with the outlying circuits by means of the wires H. H'. H². and the insulated binding screws H³. H⁴. H⁵. in the base A¹⁰. of the machine. The circuit wheel E⁵. however, has only two sections and is provided with but two contact springs G³. G⁴. having wire connections with the insulated binding screws H⁶. H⁷. in the base A¹⁰. of the machine. The section E¹⁰. of the circuit wheel E⁵. is smooth like the small sections of the other wheels but its other section is provided with a single tooth E¹¹. see Fig. 3. upon which the terminal G⁴. normally rests.

The purpose and operation of the machine will now be described, and can be more readily understood by referring to Fig. 3. in which the essential parts are shown theoretically and by diagram only.

I. represents a circuit wheel of a signal box mechanism in an outlying box circuit having also an electric bell I' which is sounded by the movements of an armature I² which are effected by electric impulses sent through the magnet I³ over the circuit I⁴ the current being from the battery I⁵. at the central station. The magnet J. is placed in the circuit I⁴. having a trunnioned armature J'. which is provided with a register pen J². an insulated circuit closer J³. and a bell hammer J⁴. The pen J². is adapted to record signals upon the register tape K. of a register of the usual construction which regulates the movement of the tape during the reception of a signal and the type wheels L. of the time stamp device are placed in close proximity to the register so that the tape after having the signal recorded upon it by the register will pass between the presser B. and the type wheels L. of the time stamping device. The circuit closer J³. closes a normally open circuit M. through the magnet D'. which causes the armature D. to move against the poles of the magnet and not only bring the presser B. down upon the tape K. and thereby cause the time to be stamped upon the latter, but also draws the detent A¹². away from the end of the escapement lever E⁶. and allows the circuit wheels upon the shaft E. to rotate from right to left as indicated by the arrow. The position of the mechanism shown in the diagram represents the local circuit M. as just having been closed by the reception of the initial break in the circuit I⁴. caused by the starting of the circuit wheel I. which in turn caused the armature J'. to drop away from the magnet J. and thereby closed the open circuit M. by means of the circuit closer J³. The local circuit M. is from the battery M'. through the circuit closer J³. the magnet D'. the wheel E⁵. its tooth E¹¹. and the contact spring G⁴. back to the battery. Now, it will be noticed that although the circuit wheel shaft E. has barely commenced its rotation yet the contact spring G⁴. is about to leave contact with the tooth E¹¹. so that by the time the second

notch of the signal wheel I. reaches the contact spring I⁶. and thereby causes the magnet J. to allow its armature J'. to make the circuit closer J³. again close the local circuit M. the tooth E¹¹. of the circuit wheel E⁵. will have left contact with the spring G⁴. and therefore the circuit M. will be opened notwithstanding the closure by the circuit closer J³. and no more impressions of the presser B. will be made upon the tape K. The time in which the circuit wheel I. makes its revolution is less than the time required for the shaft E. and consequently the circuit wheel E⁵. to make its revolution so that the circuit wheel I. will always have completed its signal before the tooth E¹¹. of the circuit wheel E⁵. again makes contact with the contact spring G⁴. By this arrangement only a single impression of the time stamp mechanism will be made for each signal sent in from a signal box, this being the object and purpose of the single closure of the local circuit M. by the circuit wheel E⁵. and contact spring G⁴.

The "answer-back" feature will now be explained.

It will be noticed that the main circuit I⁴. is through the wheel E⁸. through the contact spring G'. and the switch N. Now, it will be supposed that it is desired to attract the attention of a patrolman when he makes his "report" call while operating the circuit wheel I. of the outlying signal box. The operator at the central station places the switch N. in the position shown in the diagram, at any time before the patrolman sends in his signal. Now, when the initial impulse of the signal from the wheel I. comes in it causes the local circuit M. to effect the release of the escapement lever E⁶. of the circuit wheel shaft E. as has already been described in referring to the operation of the time stamp mechanism. The circuit wheel E⁸. therefore rotates slowly keeping the circuit I⁴. closed at that point until the notch E¹². reaches the spring G'. which will cause a break to occur in the circuit and thereby make a signal upon the bell I'. in the signal box and thereby give the desired attention or "answer-back" signal to the patrolman. On account of the slower time of the rotation of the shaft E. than that of the circuit wheel I. the latter will have completed its signal, as has already been explained with reference to the operation of the circuit closing wheel E⁵. so that the signal upon the bell I'. caused by the notch E¹². in the circuit wheel E⁸. will come after the signals caused by the rotation of the circuit wheel I. which will have come to rest.

The operation of the circuit wheel E⁹. is precisely the same as that already described regarding the wheel E⁸. and in fact the wheels E⁸. and E⁹. both represent the two notched sections of the wheel E'. in Fig. 1. they being only separated in the diagram for the purposes of clearness and better illustration. The wheel E⁸. is represented as having two notches which will give two signals upon the

bell I'. while the wheel E⁹. is shown with three notches which gives three signals upon the bell I'. Any other signals different to these can be obtained by making suitable notches in the wheels (or sections) E⁸. and E⁹. The wheel E⁹. is brought into circuit by throwing the switch N. upon the terminal N'. and when it is desired to dispense with the "answer-back" service this can be done by cutting out the "answer-back" wheels E⁸. E⁹. which is done by bringing the switch N. upon the terminal N². The key O. is for the purpose of signaling manually upon the bell I'. and any independent signals that may be desired to be given to the person at the outlying signal box. A switch P. having a short wire connection P'. with the battery I⁵. is for the purpose of closing the circuit I⁴. through the magnet J. when brought upon the terminal P². in case a break should occur in the line anywhere outside the central station. The object of this short circuiting of the circuit I⁴. is to prevent the armature J'. from falling away from the magnet J. in case a break should occur in the line I⁴. outside of the central office and thereby cause the register and the timestamp and "answer-back" mechanism to operate unnecessarily. The relay mechanism which operates the circuit closer J³. is shown as being the armature pen mechanism of a register but any ordinary relay placed in the circuit I⁴. will operate the magnet D'. as well as the one shown, but this, however, would necessitate the use of another office magnet in the circuit I⁴. which is to be avoided if possible. This whole arrangement of having but one office magnet J. in the main circuit I⁴. to operate the register, the signal bell J⁴. and the time stamp mechanism and answer back device through the circuit closer J³. and but one local circuit M. having only one magnet D'. to operate both the time stamp and "answer-back" mechanism I believe to be new and reduces the amount of magnets and circuits requisite to a minimum.

The register mechanism which is represented by the wheels K'. K². may be of any of the usual forms of multiple pen registers having one magnet J. for each outlying box circuit in a municipal signal system, but as it is intended to work in conjunction with the time stamping mechanism in recording the signal given from the signal box and in moving the tape between the presser and the type wheels of the time stamping device, it therefore becomes an element of the working combination. So also, the circuit connections and the mechanism contained therein as shown in Fig. 3. are required to make a practical working combination of the parts of the device.

K³. represents the escapement mechanism of the register mechanism which moves the tape K. and J⁵. represents the detent which controls its movement and which is shown as secured to the armature J'.

The connections I⁶. I⁷. I⁸. having termi-

nals N^1 , N^2 , N^3 , and the switch N , by which the wheels E^7 , E^8 , E^9 , are brought into the circuit I^4 , as well as the short circuit connection P' with the circuit I^4 , having the switch P , and the terminal P^2 , in the circuit I^4 , by which the movement of the armature D , may be controlled in case of a break in the circuit I^4 , are also essential elements of the combination of the parts of the device.

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

1. The combination, with a circuit and an electro magnet therein, of a pivoted armature, a printing lever carried by the armature, type-carrying mechanism, a rotating detent engaging the armature, a wheel in the circuit carrying the detent, said wheel in its revolution opening and closing the circuit, substantially as described.

2. The combination, with tape-carrying mechanism, and an escapement therefor, of a signal circuit having a circuit wheel and an electro-magnet in the circuit, and a pivoted armature carrying a detent engaging said escapement, an alarm device, and a pen co-acting with said tape, substantially as described.

3. The combination, with a signal circuit, having therein electro-magnetic devices, and a multiple closure circuit wheel, of a local circuit, the closure of which is operated by said electro-magnetic devices, and having therein a single closure circuit wheel normally closing said local circuit, but breaking said circuit at the commencement of revolution thereof, and during the rest of its revolution, substantially as described.

4. The combination, with a signal circuit, a circuit wheel, and electro-magnetic devices therein, of a local circuit adapted to be closed by the electro-magnetic devices of the signal circuit at the commencement of revolution of said circuit wheel, and a revoluble part in said local circuit, set in motion at the closure of said local circuit, said revoluble part opening said local circuit in the continuation of its motion, substantially as described.

5. The combination, with type-carrying devices, and a printing lever therefor, of a circuit, electro-magnetic devices in the circuit adapted to operate the printing lever, and a revoluble part in said circuit set in motion upon said action of said devices, the continued movement of said revoluble part restoring said electro-magnetic devices to their condition before operating the printing lever, substantially as described.

6. The combination, with a main circuit, outlying signal circuit wheel, and magnet therein, of a home answer back signal circuit wheel arranged to be thrown at will into said circuit, a local circuit controlling said answer back circuit wheel and having therein a magnet the armature of which carries a stamp, and tape carrying mechanism, controlled by the armature of the magnet in the main cir-

cuit, coacting with said stamp, substantially as described.

7. The combination of a signal circuit having an outlying signal circuit wheel, a home circuit arranged to be closed by the first break of the signal circuit as its wheel revolves, tape and carrier mechanism therefor, a pen arranged to be actuated at each break of the signal circuit to mark the tape, a printing presser for the tape operated by the home circuit as it is closed, and a shaft and motor mechanism therefor, said shaft carrying an answer back circuit wheel in the signal circuit and a single closure circuit wheel in the home circuit substantially as described.

8. The combination of a signal circuit having an outlying signal circuit wheel, a home circuit arranged to be closed by the first break of the signal circuit as its wheel revolves, tape and carrier mechanism therefor, a pen arranged to be actuated at each break of the signal circuit to mark the tape, a printing presser for the tape operated by the home circuit as it is closed, and a wheel in the home circuit and motor mechanism therefor, the period of revolution of said wheel being greater than that of the signal circuit wheel, said wheel breaking the home circuit except at the initial and final points of a complete revolution, substantially as described.

9. The combination of the electro-magnet D' , an armature lever A , provided with an armature D , a detent A^{12} , and also a presser B , a circuit wheel E^5 , having a motor shaft E , and an escapement mechanism E^6 , a circuit terminal spring G^4 , adapted to make contact with the circuit wheel E^5 , and the circuit M , provided with the circuit closer J^3 , and including in circuit the magnet D' , the wheel E^5 , and the terminal spring G^4 , substantially as specified.

10. In a time stamping and signal mechanism the combination of the signal box circuit I^4 , having a circuit breaker I , and the magnet J , in circuit therewith, the armature J' , for the magnet J , provided with the register detent J^5 , and the circuit closer J^3 , a register having a tape moving mechanism K' , K^2 , and having the escapement mechanism K^3 , adapted to be controlled by the detent J^5 , the circuit M , having the magnet D' , therein and having a connection with the circuit closer J^3 , the armature D , for the magnet D' , provided with a presser B , and the type wheel mechanism L , against which the presser B , is adapted to make impressions by the movement of the armature D , substantially as specified.

11. In a time stamping and signal mechanism the combination of the signal box circuit I^4 , having a circuit breaker I , and the magnet J , in circuit therewith, the armature J' , for the magnet J , provided with the register detent J^5 , and the circuit closer J^3 , a register having a tape moving mechanism K' , K^2 , and having the escapement mechanism K^3 , adapted to be controlled by the detent J^5 , the cir-

cuit M. having the magnet D'. therein and a connection with the circuit closer J³. and also a connection with a contact spring G⁴, the armature D. for the magnet D'. having a presser B. and a detent A¹². secured thereto, a time stamping type wheel mechanism L. against which the presser B. is adapted to make impressions, and a motor shaft E. having the circuit wheel E⁵. which is adapted to close the circuit M. through contact spring G⁴. and also having an escapement lever G⁶. through which its rotation is controlled by the detent A¹². substantially as specified.

12. In a time stamping and signal mechanism the combination of the signal box circuit I⁴. having the circuit breaker I. the magnet J. and the switch N. in circuit therewith, the armature J'. for the magnet J. having the circuit closer J³. secured thereto the circuit M. having the magnet D'. in circuit therewith and having a connection with the circuit closer J³. the armature D. for the magnet D'. provided with the detent A¹². the motor shaft E. provided with an escapement lever E⁶. and having the circuit wheels E⁷. E⁸. E⁹. connected therewith the contact springs G. G'. G². adapted to make contact with the circuit wheels E⁷. E⁸. E⁹. respectively and being provided with the connections I⁶. I⁷. I⁸. having the terminals

N'. N². N³. for the switch N. and by means of which the circuit wheels E⁷. E⁸. E⁹. may be brought into the circuit I⁴. substantially as specified.

13. In combination with the motor shaft E. having the signal circuit wheel mechanism E⁷. E⁸. E⁹. and the time stamp circuit wheel E⁵. and being provided with an escapement mechanism E⁶. the armature D. having the detent A¹². for the escapement mechanism E⁶. and the presser B. for the time stamp mechanism secured thereto, the magnet D'. for the armature D. the circuit M. through the magnet D'. having a connection with the wheel E⁵. and being also connected with a circuit closer J³. the armature J'. provided with circuit closer J³. and adapted to close the circuit M. the magnet J. adapted to energize the armature J'. and the signal box circuit I⁴. having the circuit breaker I. and the magnet J. therein and also having terminal connections G. G'. G². with the wheels E⁷. E⁸. E⁹. respectively and the switch N. by means of which the wheels G⁷. G⁸. G⁹. may be cut out of circuit, substantially as specified.

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Witnesses:

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