

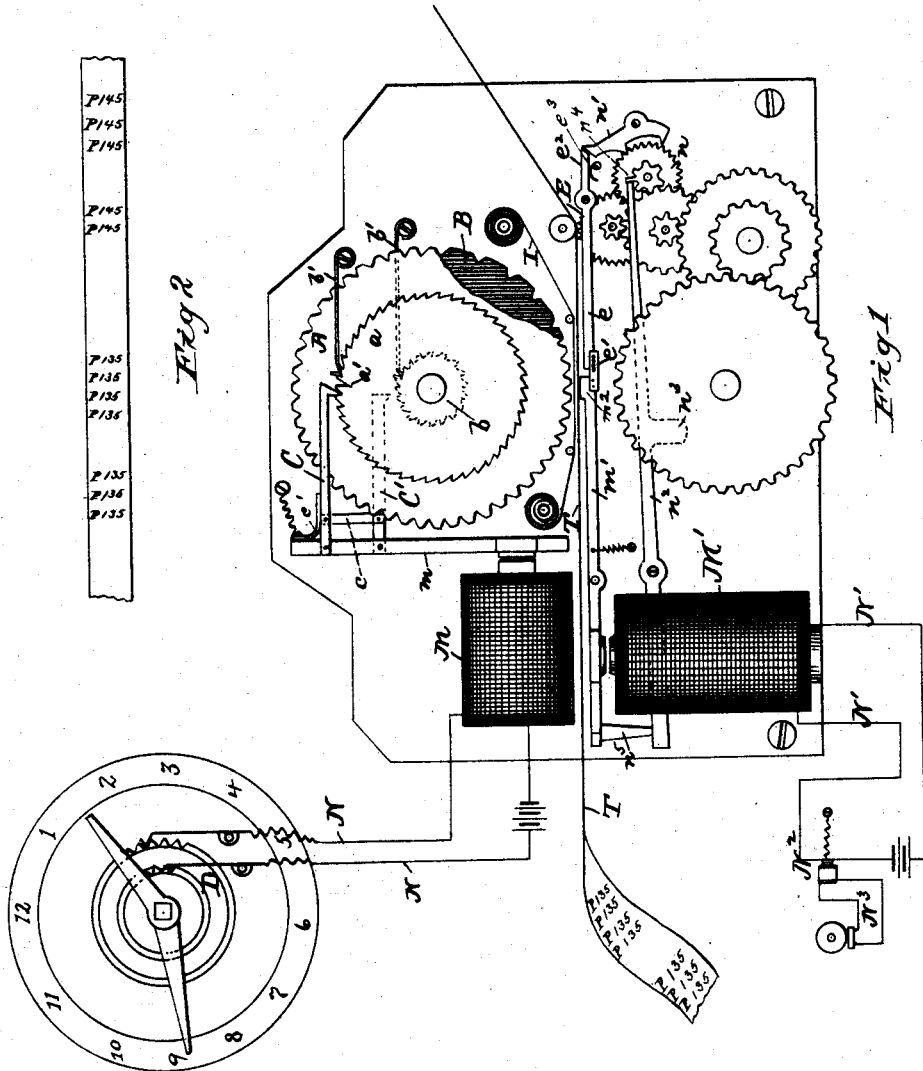
(No Model.)

F. B. WOOD.

APPARATUS FOR ELECTRICALLY RECORDING SIGNALS.

No. 420,852.

Patented Feb. 4, 1890.



WITNESSES:

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## APPARATUS FOR ELECTRICALLY RECORDING SIGNALS.

SPECIFICATION forming part of Letters Patent No. 420,852, dated February 4, 1890.

Application filed September 23, 1889. Serial No. 324,733. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK B. WOOD, of the city, county, and State of New York, a citizen of the United States, have invented certain  
5 new and useful Improvements in Apparatus for Electrically Recording Signals, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention consists in the combination, in an electrical signal-recording instrument, of the devices hereinafter particularly described and as more at length recited in the claim, whereby the imprinting of such signals  
15 upon the tape or recording medium is effected in accordance with my improved method of recording the same, which consists in imprinting upon said tape the signs or figures indicating the time at or about which the signal is received and recorded, singly or in repetition, in the succession and order to represent by the impressions thus made the number of the signal given, transmitted, and recorded.  
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Figure 1 is an elevation of an electrical recording-instrument containing my invention, and Fig. 2 is a plan or face view of a recording tape or medium bearing signals imprinted  
30 thereon in accordance with my improved method.

In the mechanism herein shown the time-indicating device comprises a minute-registering wheel A, having upon its periphery divisional faces equal in number to the intervals during an hour which it is desired to indicate upon the recording-tape T. This wheel is herein shown with sixty such faces, one for each minute of an hour; but the faces may be  
40 of such number as to indicate intervals of five, ten, fifteen, or other number of minutes.

B is an hour-registering wheel, having twenty-four divisional faces on its periphery, one for each hour of a day. The said faces of wheels A and B bear in succession type indicating, respectively, the number of the minute and hour and a sign or letter distinguishing the ante-meridian and post-meridian hours. These wheels are mounted to rotate  
50 on a common shaft, and each has fixed to it a

ratchet *a b*, respectively, said ratchets having each the number of peripheral teeth corresponding to the number of peripheral faces on their respective wheels A B. On the periphery of the ratchet *a* is the deep notch *a'*  
55 immediately beyond the tooth thereon, which is in line with the peripheral face of wheel A, indicating the final minute of the series or succession thereon, said face being also in line with one of the faces on the hour-wheel  
60 B. The ratchets are controlled by spring-detents *b'*, as shown.

C and C' are pawls to the ratchets *a* and *b*, respectively, and are pivoted independently to the armature *m* of a magnet M, and are  
65 pivotally united by a link *c*, which is of such a length that when the pawl C is riding the ratchet *a* the pawl C' will be held free of engagement with the ratchet *b* and until pawl C enters the notch *a'* on ratchet *a*, when such  
70 movement of said pawl will permit pawl C' to engage a tooth on ratchet *b*. The pawls are pressed to engagement with their ratchets by a spring *c'*, as shown.

The magnet M is in a local circuit N with  
75 a time-piece, as shown, which is provided with a circuit-closing wheel D, of any ordinary pattern, having a number of peripheral contact-points equal to the number of teeth on ratchet *a*. The closing of circuit N at intervals by wheel D in the time-piece will vibrate  
80 the armature *m*, and thus cause the pawl C to rotate the wheel A at each vibration the distance of one of its peripheral faces; and in like manner, when the pawl C enters notch  
85 *a'* on ratchet *a*, which it will do at the conclusion of each complete revolution of wheel A, the vibration of armature *m* will, by the engagement of pawl C' with ratchet *b*, cause the rotation of both the wheels A and B  
90 the distance of one of the peripheral faces of each. The sums of the rotations of wheel A will thus be indicated on wheel B, so that the faces of said wheels which are in line with each other immediately above the recording-tape may indicate the hour and interval or minute of the succeeding hour in  
95 correspondence with the time-piece.

In constructing the ratchets *a* and *b* they are given such relative diameters that, while  
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each ratchet bears the described number of teeth, the teeth upon both ratchets will be of the same or equal length or pitch.

An inking-ribbon I is interposed between 5 the peripheral faces of wheels A and B and the recording-tape, and  $m'$  is an armature carrying the printing-pad  $m^2$ , serving to effect the printing upon said tape.

The well-known devices common in Morse 10 registers may be employed to actuate the armature  $m'$  and move the recording-tape—namely, a clock-work train, as shown, having an escapement  $n$  and its pallet  $n'$ , a friction-lever  $n^2$ , with its arm  $n^3$  bearing against the 15 face of the drum of the clock-train and engaging a stop-pin  $n^4$  on the escapement-shaft, together with a magnet  $M'$  in a local circuit  $N'$ , which is closed by a relay  $N^2$  when a signal is transmitted from the main-line circuit 20  $N^3$ , and an arm  $n^5$  on the armature  $m'$ , which engages the friction-lever  $n^2$  and oscillates it to release the stop-pin when said local circuit  $N'$  is closed.

To check the movement or feed of the tape 25 after the pin  $n^4$  has been released and while the signal is coming in, so that the vibrations of armature  $m'$  may effect the proper printing of the signal, I employ a lever E, one arm  $e$  of which is pivotally attached to an arm or 30 extension on the armature  $m'$  by a pin  $e'$ , working in a slot in said arm, as shown, and the other arm  $e^2$  of which is adapted to engage the heel of the pallet  $n'$  when said armature is vibrated to effect the printing.

A spring  $e^3$  may be employed to assist in 35 lifting the arm  $e^2$  from engagement with pallet  $n'$  when the armature is retracted on the opening of the circuit.

At each vibration of the armature  $m'$  on 40 the closing of circuit  $N'$  during the passage of a signal from the main line the lever E will engage the pallet  $n'$ , and thus check the feed of the tape T at the instant that the printing-pad  $m^2$  is carried against the time- 45 wheels, and that at each succeeding retraction of said armature and so long as the circuit is open said lever will disengage said pallet, and therefore permit the tape to feed. By this means the number of impressions of 50 the type on the time-wheels made upon the recording-tape will correspond to and be in such succession and groups as will represent the number of the signal sent in from the main line. By this means I am enabled to 55 represent or register the signals upon the tape by imprinting upon said tape the signs or figures indicating the time at or about which the signal is received and recorded,

singly or in repetition, in the succession and order to indicate by the impressions thus 60 made the number of the signal received. For example, if the signal "34" is received at one o'clock and thirty-five minutes in the afternoon, I imprint upon the tape the sign and 65 figures "P. 1.35" three times in succession, and then, after an interval or space, four times in succession, so that said three and four im- 70 pressions on the tape indicate the number thirty-four, as shown on the tape in the drawings. Similarly a signal "23" will be printed 75 on the tape if received at one o'clock and forty-five minutes in the afternoon, as shown in the drawings, Fig. 2.

I do not claim herein my improved method 80 of recording electrical signals, which consists in imprinting upon a recording medium the figures indicating the time at or about which the signal is received and recorded in a suc- 85 cession of impressions corresponding in number and relative location to and representing the number of the signal, but reserve the same herein, as the same has been made the 90 subject-matter of a separate application for patent filed May 9, 1889, Serial No. 310,782.

The time-wheels A and B and their de- 85 scribed ratchets and operating-pawls are not claimed as novel herein, but are more fully described and made the subject of claims in an application for patent filed May 9, 1889, 90 Serial No. 310,110. Any other known and equivalent time indicating and recording devices than said wheels A and B and their said actuating mechanism may be employed in 95 connection with the herein-described signal-printing mechanism.

What I claim as my invention, and desire to secure by Letters Patent, is—

In an electrical recording-instrument, the combination, with the time-indicating device and its actuating mechanism and the signal- 100 receiving device and its actuating mechanism, adapted to co-operate, substantially as described, with said time-indicating device to record a signal, of a lever E, one arm  $e$  of 105 which is pivotally connected at  $e'$  to the armature of the magnet of the actuating mechanism of said signal-receiving device, and the other arm  $e^2$  of which is adapted to engage and disengage the pallet  $n'$ , working to the escapement  $n$  of said actuating mechanism, 110 substantially as and for the purpose set forth.

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Witnesses:

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