April 1, 1941. C. R. DOTY 2,237,137

TIME RECORDING SYSTEM

Filed June 8, 1938 2 Sheets-Sheet 1

FIG.1.

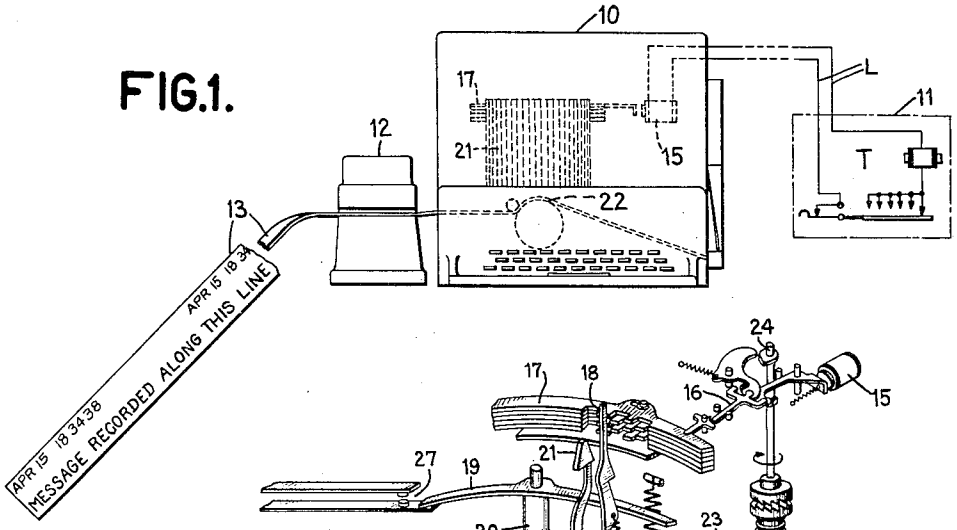
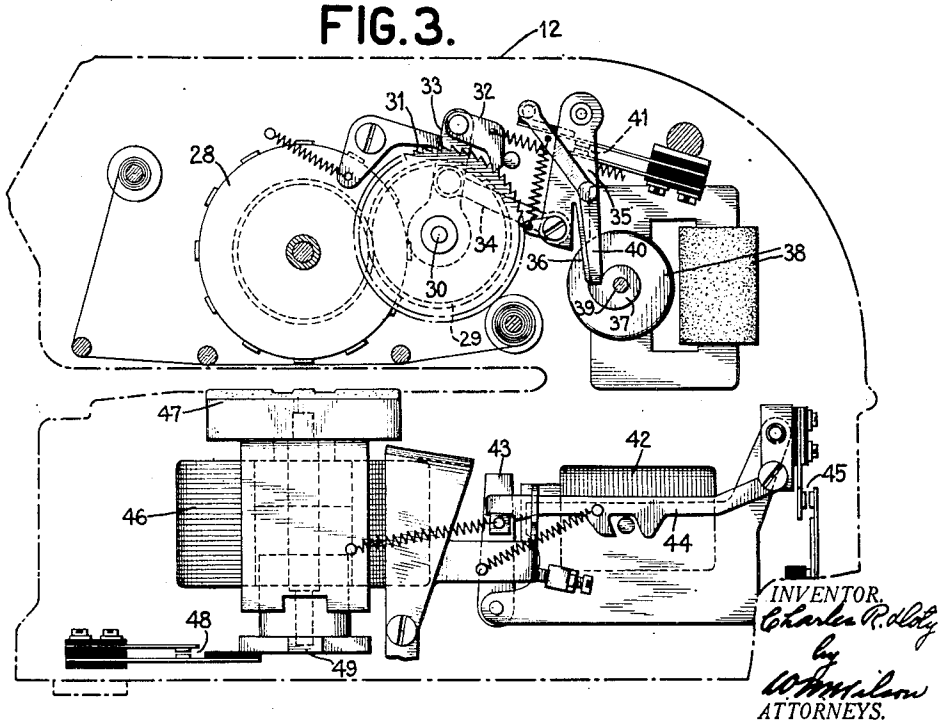


FIG.2.

FIG.3.



INVENTOR.
Charles R. Doty
by
W. M. Wilson
ATTORNEYS.

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FIG.4.

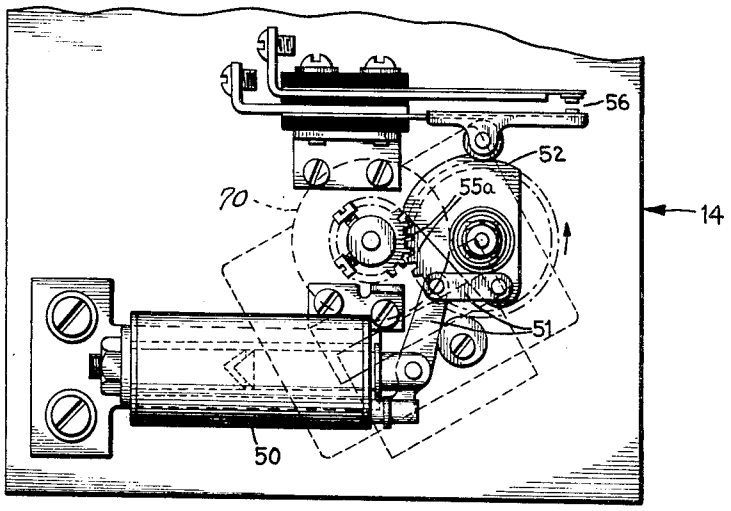


FIG.4A.

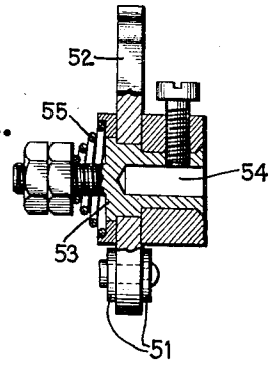
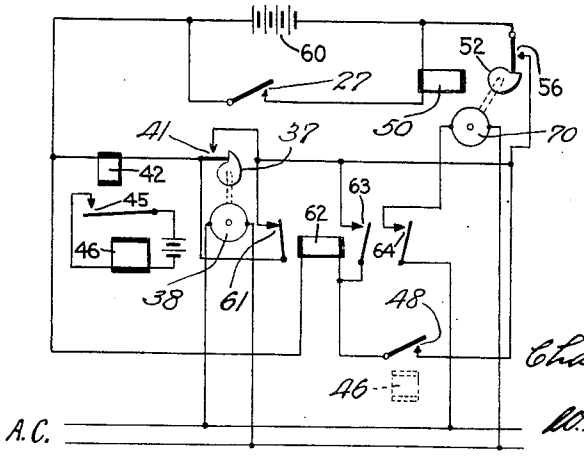


FIG.5.



INVENTOR.
Charles R. Doty
ATTORNEYS.

Patented Apr. 1, 1941

2,237,137

UNITED STATES PATENT OFFICE

2,237,137

TIME RECORDING SYSTEM

Charles R. Doty, Binghamton, N. Y., assignor to International Business Machines Corporation, New York, N. Y., a corporation of New York

Application June 8, 1938, Serial No. 212,526

6 Claims. (Cl. 234—27.5)

This invention relates to automatic time imprinting systems and more particularly to time recording systems applicable to signaling systems, such as printing telegraph systems.

An object of the present invention is to provide means whereby time imprinting means are adapted to be rendered operative upon operation of the signaling device to effect true time registration on a suitable record and thereafter register automatically at periodic intervals the time as long as the signaling device is operated.

Another object of the present invention resides in the provision of means whereby the time registration is made on the same message blank upon which the character signals are recorded.

Another object resides in the provision of means whereby the time imprinting system is rendered inoperative at a particular timed interval after completion of operation of the signaling device.

Another object resides in the provision of time delay mechanism which is controlled independently of the signaling device to render the automatic time imprinting system inoperative whenever the signaling device is rendered inoperative.

To illustrate a method to attain the above-mentioned objects, the embodiment to be described presently is shown to comprise a signaling device such as a teletypewriter which is adapted upon operation thereof to render operative a timing control unit which in turn is effective to control the operation of a time imprinting device thereby effecting true time registration upon the same side or face of a message blank or tape upon which the characters are recorded in accordance with the operation of the teletypewriter. As long as the teletypewriter is operated, the time imprinting device is adapted to be operated automatically and independently of the teletypewriter to register the time at periodic intervals upon the message blank. Provision is also made to render inoperative the time imprinting system at a predetermined timed interval after the signaling device is rendered inoperative.

In the drawings:

Fig. 1 is a diagrammatic view showing the relationship of the signaling device such as a teletypewriter with a time imprinting unit to effect the recording of both on the same face of the message blank.

Fig. 2 is a detail view of the teletypewriter showing the relationship of the control elements thereof.

Fig. 3 is a side elevation view showing the main operating elements of the time imprinting unit.

Fig. 4 is a side elevation view showing the control elements of the time delay unit.

Fig. 4—A is a detail view showing the frictional mounting for the cam element.

Fig. 5 is a circuit diagram of the system.

General description

The time and message recording system is shown to comprise a signaling device such as the teletypewriter 10 in Fig. 1 which is adapted to be controlled by a similar device 11 at a remote station. Associated with the teletypewriter unit is shown a time imprinting unit 12, such as a time stamp, disposed adjacent to the teletypewriter so that the message tape 13 is fed directly from the message recorder to the time recorder unit. The said tape is adapted to be aligned in the time imprinting unit so that the time registration is not only recorded on the same side of the tape as the message but also adapted to be recorded above the message. The time imprinting system is adapted to be rendered operative immediately upon operation of the teletypewriter unit. It will be obvious from the description to be set forth herein that the signaling device which is shown as the teletypewriter unit may be either a transmitting or receiving unit. In the present illustration the time printing unit is shown associated with a receiving teletypewriter unit 10. The said teletypewriter unit is controlled by a similar unit 11 at a remote station and is adapted to be rendered operative upon the receipt of the character signals impressed upon the transmission medium designated L.

Upon operation of the message recording unit a time delay mechanism generally indicated at 14 (Fig. 4) is set in operation to operate the time imprinting unit 12 to register upon the tape 13 the true time of receipt of the first signal. As long as the teletypewriter unit is operated, the time stamp is operated at periodic intervals to register the time upon the message tape. The mechanism to effect this automatic operation is independent of the message recording unit and controlled solely by the time imprinting unit. When the teletypewriter is rendered inoperative, the time delay mechanism, after a predetermined timed interval, is effective to render inoperative the time imprinting unit. Similarly, during the timed period that the teletypewriter is operated, the said mechanism is adapted to be in operation but is restrained from being effective and from rendering the time system inoperative until the teletypewriter no longer is functioning.

The different control units just mentioned will now be described in detail.

Signal recording device

The signaling device is shown to comprise a message recording mechanism such as the well-known teletypewriter disclosed and described in detail in the United States Patent 1,745,633, issued February 4, 1930, so that it is deemed necessary only to set forth the following brief description of the operation thereof. It is well known that upon receipt of the character or code signals by the control magnet unit 15 that character type bar selection is effected by selectively positioning the selector mechanism generally designated 16 which in turn is effective to position selectively the permutation or code bars 17 in accordance with the signals received and impressed upon the said control magnet unit. Upon positioning of the code bars, a particular actuating bar 18 is selected and then operated by the printing bail 19 supported by the plunger 20 to operate the selected type bar 21 to engage the printing platen 22 to record the selected character.

It is well known that immediately upon selection or positioning of the code bars 17 that the cam element 23 is set in motion to be rotated by the continuously rotating shaft 24 operating the cam follower member 25 and lever 26 associated with the printing bail plunger 20. The cam element 23 is adapted to make one revolution and is then brought to rest at a normal position for each printing operation. Therefore, it is seen that the printing bail 19 is operated each time the code combination of signal impulses are impressed upon the control magnet.

The contacts 27 are provided in the teletypewriter unit and are suitably disposed adjacent to the printing bail 19 so as to be operated each time the said bail is operated to effect recording of a character. Therefore, it is understood that the contacts 27 are operated each time a character is recorded upon the message tape 13. The purpose of the said contacts will be understood as the description progresses.

Time imprinting unit

The time registration or recording unit is shown to comprise a well known type of time stamp and is similar to the time stamp fully disclosed and described in the United States Patent 1,798,583, dated March 31, 1931. Therefore, it is believed that the following brief description thereof will suffice.

The time stamp generally is shown to comprise the usual type elements 28 of which any number may be provided to register the hours, minutes and seconds, if so desired, and are adapted to be positioned by the driving gear 29 which is secured to shaft 30. The type wheels are provided with the usual transfer mechanism and thus are adapted to indicate any of the desired increments of time. Secured to the shaft 30 is a ratchet wheel 31 which is adapted to be positioned periodically by the pawl 32 pivotally supported by the lever 33 which is rotatably mounted on shaft 30. Attached to the lever 33 is an arm 34 which has connection with a part of the bell crank member 35 pivotally supported by the unit which also has an extension arm 36 adapted to be positioned by the cam 37. It should be mentioned here that the cam 37 is not provided in the Patent 1,798,583. In this said patent the standard impulse magnet is provided to actuate the pawl mechanism, whereas in the present time stamp mechanism a synchronous motor generally indicated at 38 is provided to rotate the shaft 39 upon which the cam 37 is secured. The synchronous motor is adapted to rotate the shaft 39 one complete revolution each minute. Of course, it is obvious that the mechanism can be arranged for any desired interval of time. The said cam 37 is not only adapted to position the bell crank lever 35 every minute so as to actuate the ratchet 31 and shaft 30, thus positioning the type wheels accordingly but is also adapted to position the lever 40 pivotally secured to the lever 35 to actuate the contacts 41 every minute or periodically in accordance with the chosen time interval. The purpose of the said contacts will be understood as the description progresses.

The time stamp is provided with the usual control relay 42 which upon energization is adapted to attract the armature 43 and actuate the lever 44 to operate the control contacts 45. The contacts 45 as shown in Fig. 5 are connected directly to the time stamp solenoid 46 to effect energization of the said solenoid each time the contacts 45 are closed. Energization of the solenoid causes the printing platen 47 to be raised to engage the type wheels 28 and thus to effect time registration upon the tape 13 indicating the true time when the said time stamp is rendered operative. Contacts 48 are provided and are suitably disposed so as to be operated by the armature 49 of the solenoid each time the solenoid is energized. The purpose of these contacts will be explained in connection with the description of the circuit diagram.

Time delay mechanism

Referring now to Figs. 4 and 4—A, it is shown that the timing control unit comprises a control solenoid 50 and the associated linkage 51 which is connected to the solenoid plunger and the cam element 52 which is frictionally mounted on sleeve 53. The sleeve is secured to shaft 54 which is adapted to be rotated by the gearing indicated generally at 55*a* which in turn is driven by the synchronous motor 56. Whenever the said motor is inoperative and the solenoid 50 is energized, it is to be understood that the cam element 52 is rotated in a clockwise direction. A spring 55 is provided to maintain the sleeve 53 in firm frictional contact with cam element 52, but the energized solenoid is of sufficient strength to position the cam element in a clockwise direction notwithstanding the effort of the spring 55 to keep the cam element and the sleeve in a fixed relationship with each other. The said plunger and linkage and cam element 52 are adapted to remain in the described position whenever the solenoid 50 is deenergized. It is noted that contacts 56 are provided to cooperate with the cam element 52 and upon energization of the solenoid 50, to rotate the said cam in a clockwise direction, the contacts 56 are closed and remain closed upon deenergization of the said solenoid until the cam element 52 is repositioned to the normal rest position as shown in Fig. 4, whereupon the contacts 56 are then opened. The cam element 52 is repositioned to the normal position shown in Fig. 4 by the synchronous motor 70 which, through the described gearing 55*a*, is adapted to rotate the shaft 54, sleeve 53, and cam element 52 in a counterclockwise direction. The synchronous motor can be chosen so as to rotate the shaft and cam element at any desired rate. It should be assumed that the gear ratio in the present illustration is such that a time interval of the order of ten seconds is required for the motor 70 to reposition the cam element from its

farthest position to the right as viewed in Fig. 4 to the normal position indicated in the figure. Thus, it is understood that upon energization of the solenoid 50 and the positioning of the cam element 52 that without further energization of the solenoid 50 during a ten second interval and assuming that the synchronous motor 56 is immediately set into operation that the ten seconds is then required to restore the cam element 52 to the normal postiion to open the contacts 56. However, if during the time interval that the synchronous motor 70 is operating and partly effective to reposition the cam element 52, the solenoid 50 is energized, the cam element 52 is then again positioned to its extreme right hand position, thus requiring an interval of ten seconds after the last energization of the solenoid 50 for the motor 70 to be effective to fully restore the cam element to the normal position to open the contacts 56. The purpose of this arrangement will now be described.

Operation of the system

Referring now to Fig. 5 and assuming that all the control elements just described are inoperative and that the message tape 13 is properly aligned in the time stamp mechanism 12, and that the teletypewriter unit 11 at the remote station is now set into operation to impress the character signals upon the transmission medium to energize the teletypewriter control magnet 15 to effect proper selection of the code bars 17 thereby effecting recording of the character upon the tape 13. The contacts 27 are operated upon recording the said character to energize the control solenoid 50 of the timing control unit to position the cam element 52 to its farthest right hand position as viewed in Fig. 4, thus closing the contacts 56. Upon closure of the last mentioned contacts, a circuit is completed from one side of the battery 60 through the contacts 56 and the normally closed contacts 61 of relay 62 to the time stamp control magnet 42 to the other side of the said battery, thus energizing the said magnet. Energization of the magnet 42 is effected to close the associated contacts 45 and thus complete the battery circuit to the time stamp solenoid 46 to effect true time registration upon the message tape 13. Upon energization of the solenoid 46, contacts 48 are closed to establish at this time a circuit from the battery through the contacts 56 now closed and the said contacts 48, the coil of relay 62 to the other side of the battery, energizing the said relay. The normally closed contacts 61 are now open to deenergize the time stamp control magnet 42 and close the contacts 63 and 64. A holding circuit is established through the contact 63 and contacts 56 for the relay 62; and an energizing circuit is completed to the motor 70 through the contacts 64 which are now closed.

Operation of the synchronous motor 70 at this time is now effective to start to reposition the cam element 52 to the normal position shown in Fig. 4. However, assume that the teletypewriter is continued to be operated in the usual manner so that character recording is effected during the predetermined timed interval, namely, ten seconds, so that the cam element 52 is repositioned to the farthest right hand position as viewed in Fig. 4 each time the contacts 27 are closed and the solenoid 50 is energized, thus preventing the contacts 56 from being opened. Thus, the relay 62 is adapted to be maintained energized during the time period the teletypewriter unit is operated by means of the described holding circuit.

Now assume that the synchronous motor 38 is being operated to properly position the type wheels 28 in the time stamp and that periodically and at predetermined time intervals, i. e. one minute, the cam 37 is effective to actuate not only the type wheels 28 but also the contacts 41. It is seen upon each operation of the contacts 41 that a circuit is completed through the contacts 56 and contacts 41 to the control magnet 42 to energize this magnet and effect closure of the associated contacts 45 to energize the time stamp solenoid, thereby effecting time registration upon the message tape 13 periodically at chosen intervals. This automatic time registration continues in the manner described until the message recorder is rendered inoperative, that is, in the event that character signals are not received during the said predetermined time interval to effect recording of the characters. Assume now that this is the case and the contacts 27 are not operated during the said predetermined time interval, thus permitting the synchronous motor 70 to be effective to fully reposition the cam element 52 to the normal position as shown in Fig. 4, thereby opening the contacts 56. Opening of these contacts is effective to break the described holding circuit to the relay 62, thereby restoring the time imprinting system to the normal inoperative condition. In this manner it is seen that upon operation of the message recorder, true time registration is effected upon the message tape and that periodic time registration is effected as long as the message recorder is rendered operative to record the characters in accordance with the signals received, and that the timing control unit is effective at a predetermined timed interval after the message recorder is rendered inoperative to recondition the time imprinting system so as to be ineffective to continue further automatic time registrations at the periodic intervals. In order to prevent superimposition under certain conditions of the initial time registration on the preceding final time registration effected, suitable well known means can be provided to advance automatically the tape a suitable distance after the last character recording. Such tape advancing means form no part of the present invention and need not be described in more detail.

While there has been shown and described and pointed out the fundamental novel features of the invention as applied to a single modification, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention therefore to be limited only as indicated by the scope of the following claims.

What is claimed is:

1. In apparatus of the class described wherein a signaling device and means for controlling the same are provided; the combination of time recording means, an initial circuit for said time recording means having normally closed contacts therein and a normally open parallel connection thereto, a periodic closing means for said parallel connection, a switching means operated initially by the signaling device to energize the initial circuit to effect operation of the time recording means to record the initial time, means effective upon operation of the time recording means to open the normally closed contacts of

said initial circuit, control means for maintaining said switching means operative during the continued operation of signaling device and for a predetermined period thereafter, the switching means when operative being adapted to cooperate with the periodic closing means to complete a circuit to the time recording means through the parallel connection to record the time at periodic intervals.

2. In apparatus of the class described wherein a signaling device and means to control the operation of said device are provided; the combination of time recording means, a control circuit extending from the signaling device to the time recording means, control means conditioned by said signaling device and effective upon initial operation of said device for energizing the control circuit to cause the recording means to record the initial time, means controlled by said time recording means upon operation thereof for breaking said control circuit, time means connected in parallel with said circuit-breaking means for completing the said circuit at periodic time intervals to operate the recording means as long as the control means remains conditioned, and means to restore the conditioned control means to normal a predetermined time period after the last operation of the signaling device.

3. In apparatus of the class described wherein a signaling device and means to control the operation of said device are provided; the combination of time recording means, may control circuit extending from the signaling device to the recording means, control means in said circuit having an ineffective home position and an infinity of effective displaced positions in which said circuit is closed, means for moving said control means to the most displaced position under control of the signaling device upon each operation of said device, means controlled by the recording means upon operation thereof for breaking said control circuit, biasing means for gradually returning the displaced control means through its displaced positions to the home position and capable of bringing it to paid home position a predetermined time after each operation of the signaling device, and a periodically operating circuit closer connected in parallel with the circuit-breaking means for completing the circuit for energizing the recording means automatically and periodically as long as the control means is in any of its displaced positions, said circuit closer being rendered ineffective to complete the circuit upon return of the control means to its home position.

4. In a system of the character described wherein a signaling device and means to govern the operation thereof are provided; the combination of time recording means, a control circuit for said recording means, control means responsive to the signaling device for completing said circuit, means controlled by the recording means as an incident to the operation thereof for breaking said circuit, and a periodically closing switch connected in said control circuit in parallel with the last mentioned means for causing the completion of said circuit to be governed jointly by the switch and the control means so as to effect operation of recording means at periodic intervals thereafter during continued operation of said signaling device.

5. In a system of the character described wherein a signaling device and means to govern the operation thereof are provided; the combination of time recording means, control means conditioned upon initial operation of said signaling device to effect immediate operation of said recording means, a periodically operated control element, and means operable by said recording means upon its initial operation to render the operation of said recording means jointly controllable by said element and said control means, the control means including means to maintain said control means conditioned during continued operation of said signaling device to cause periodic operations of the recording means upon operation of the control element and means for rendering the element ineffective to cause operation of said recording means a predetermined time interval after cessation of operation of the signaling device.

6. In apparatus of the class described wherein a signaling device and means for controlling the same are provided; the combination of time recording means, an initial circuit for said recording means having normally closed contacts therein and a normally open parallel connection thereto, a periodic closing means for said parallel connection, a switching means operated initially by the signaling device to energize the initial circuit to effect operation of the recording means to record the initial time, means effective upon operation of the time recording means to open the normally closed contacts of said initial circuit, means controlled by the last named means and the operated switching means for holding said contacts in the open position so as to maintain the initial circuit inoperative, control means for maintaining said switching means operative during the continued operation of the signaling device and for a predetermined period thereafter, the switching means when operative being adapted to complete a circuit to the time recording means through the parallel connection to record the time at periodic intervals and said switching means upon being rendered inoperative by the control means after said predetermined period causing the holding means to release the contacts so as to reestablish the initial circuit.

CHARLES R. DOTY.

CERTIFICATE OF CORRECTION.

Patent No. 2,237,137. April 1, 1941.

CHARLES R. DOTY.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 4, first column, line 32, claim 3, for "may" read --a--; line 45, same claim, for the word "paid" read --said--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 27th day of May, A. D. 1941.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.

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