

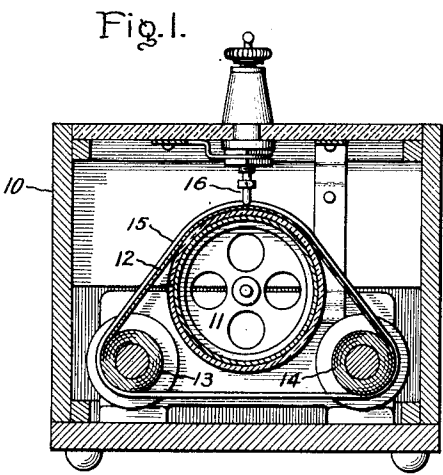
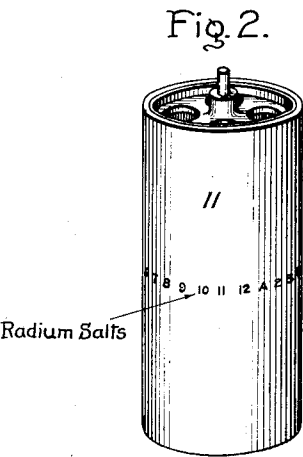
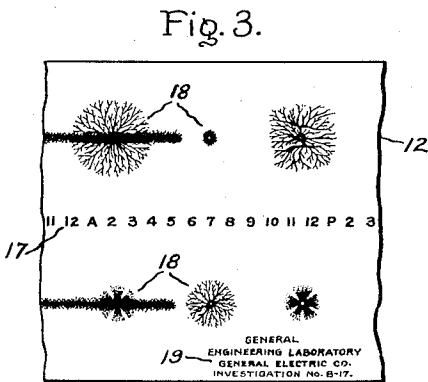
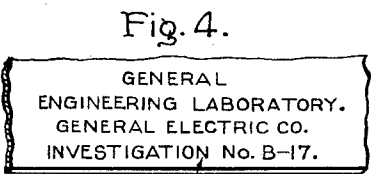
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J. A. TIEDEMAN

1,806,375

RECORDING METHOD AND APPARATUS

Filed March 3, 1927



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## UNITED STATES PATENT OFFICE

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## RECORDING METHOD AND APPARATUS

Application filed March 3, 1927. Serial No. 172,486.

My invention relates to a method of and apparatus for recording data and the like on photosensitive films or plates or upon other surfaces which are sensitive to radio active rays.

In a copending application of Clifford M. Foust, Serial No. 127,710, filed August 6, 1926, assigned to the same assignee as the present invention, there is described recording apparatus using a photosensitive record sheet in which time indications are recorded on the record sheet by photographing shadows of such figures on the sheet by radio active rays. In the present invention the figures or characters to be recorded on the film are preferably cut into the recording drum or other surface which may be brought into contact or close proximity to the film and the depressions caused by the cut in figures are then filled with a radium salt or other suitable radio active substance. Then when the unexposed film is brought into contact with the drum those portions of the film opposite the figures are exposed to the action of the radio active substance so that when the film is developed these figures are clearly indicated thereon. The present invention brings about a considerable simplification of the recording apparatus and produces exceptionally clear records.

The features of my invention which are believed to be novel and patentable will be pointed out in the claims appended hereto. For a better understanding of the invention reference is made in the following description to the accompanying drawings, Fig. 1 of which shows a sectional view of a surge voltage recorder of the type described in the above mentioned Foust application to which my invention has been applied for recording time indications on the film; Fig. 2 shows the recording drum used in the recorder as equipped with the recording feature of my invention; Fig. 3 represents a developed portion of the recording film showing records as produced by means of the present invention; and Fig. 4 shows a further modification of the invention.

Referring to Fig. 1, 10 indicates a light tight box which contains a recording drum

11 adapted to be driven by suitable clock-work, not shown. Across the upper portion of the drum is stretched a photosensitive film 12 which is unwound from a supply spool 13 on to a rewinding spool 14. Rubber bands 15, one at each end of the drum, are stretched over two spools and the drum outside the film to complete the driving connection. A pair of electrodes 16 for exposing the film to voltage discharges to be recorded rest lightly upon the film above the drum. As stated above, the film is advanced by suitable timing means and in order that the film may be timed it is desirable to have time indications recorded thereon. This is accomplished by the present invention by radio active time characters contained upon the outer surface of the drum. In some cases these characters might be merely painted on the surface of the drum by means of a deposit of radium paint. I prefer however to cut the characters in the surface of the drum and fill the depressions thus made with a radio active deposit in the manner indicated in Fig. 2. A radium salt which I have found to be particularly suitable for this application has a trade name of "Luma No. 10". The depressions are cut deep enough to hold the salt deposit from falling out and only a very small amount of the salt is necessary. If desired the depressions may first be coated with a very light film of a suitable cement and then the salt filled in and the surface smoothed off even with the surface of the drum. The radio active material is thus brought into direct contact with the film.

In this embodiment of the invention the drum makes one revolution in 24 hours and a given point of the film is in immovable contact with the drum for about 6 hours so that the radium salt to be used may be relatively weak with regard to its radio active rays. I have found that distinct characters may be recorded with the material known as "Luma No. 10" with only a 15 minute exposure. During the 6 hours the portions of the film adjacent the radium characters are exposed and due to the close contact between the film and drum the exposed portions are clear cut and produce distinct rec-

ords on the film when developed. It is not at all necessary that the material forming the surface of the drum be impervious to radio active rays although where a very strong salt is used a metallic surface more or less impervious to radio active rays would be desirable.

Fig. 3 illustrates a developed portion of the film. The time indications are shown at 17. 18 represents the nature of the surge voltage records which are thus timed. At 19 is represented additional data which may be recorded on the film before it is developed by the modification of the invention represented in Fig. 4.

Fig. 4 shows a small block of metal or other suitable substance. Any data or inscription is painted, printed or inlaid on the surface of the block with radium paint or radium salt. This block is then simply laid on or otherwise brought into immovable contact with the unexposed film for an appreciable time interval, depending upon the strength of the rays emitted therefrom, so as to expose the inscription on to the film. The strength of the salt should preferably be made much stronger in this case than is necessary in Figs. 1 and 2 in order to materially cut down the time required to obtain a clear exposure. This provides a simple and inexpensive means of recording any desired predetermined inscription on any sort of photosensitive film or plate such for example as ordinary camera films, motion picture films and X-ray plates.

In accordance with the provisions of the patent statutes, I have described the principle of operation of my invention together with the apparatus which I now consider to represent the best embodiment thereof; but I desire to have it understood that the apparatus shown and described is only illustrative and that the invention may be carried out by other means.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. A recording instrument comprising in combination with a photosensitive film, a rotary drum over which such film is moved, and means for timing said film comprising marks of radio active material equally spaced about the periphery of said drum representative of the divisions of a unit of time, and means for rotating said drum one revolution during each such unit of time, the radio active material being of sufficient strength to photographically produce timing records on said film while in contact therewith.

2. A recording instrument comprising a supply spool, a rewinding spool, a rotary drum for supporting a photosensitive film between the supply and the rewinding spools, and means for timing said film comprising time indicating characters of radio active

material equally spaced around the surface of said drum, and means for rotating said drum at a rate corresponding to such timing indications so as to photographically produce a continuous chronological time record on such film for successive rotations of said drum.

In witness whereof, I have hereunto set my hand this 28th day of February, 1927.

JOHN A. TIEDEMAN.