

C. B. WATTLES.
RECORDING DEVICE.
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1,044,835.

Patented Nov. 19, 1912.

Fig. 1.

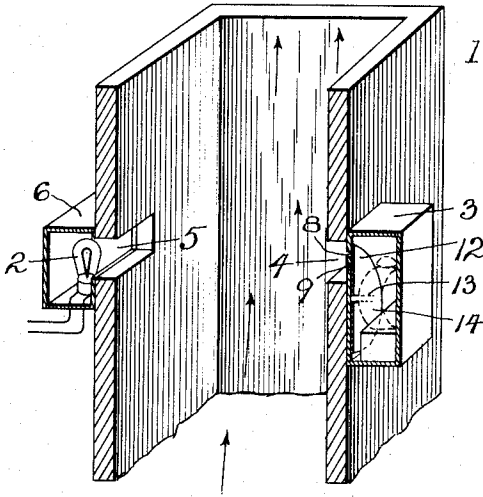


Fig. 2.

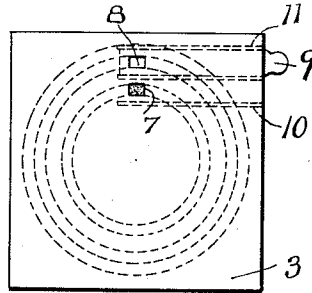
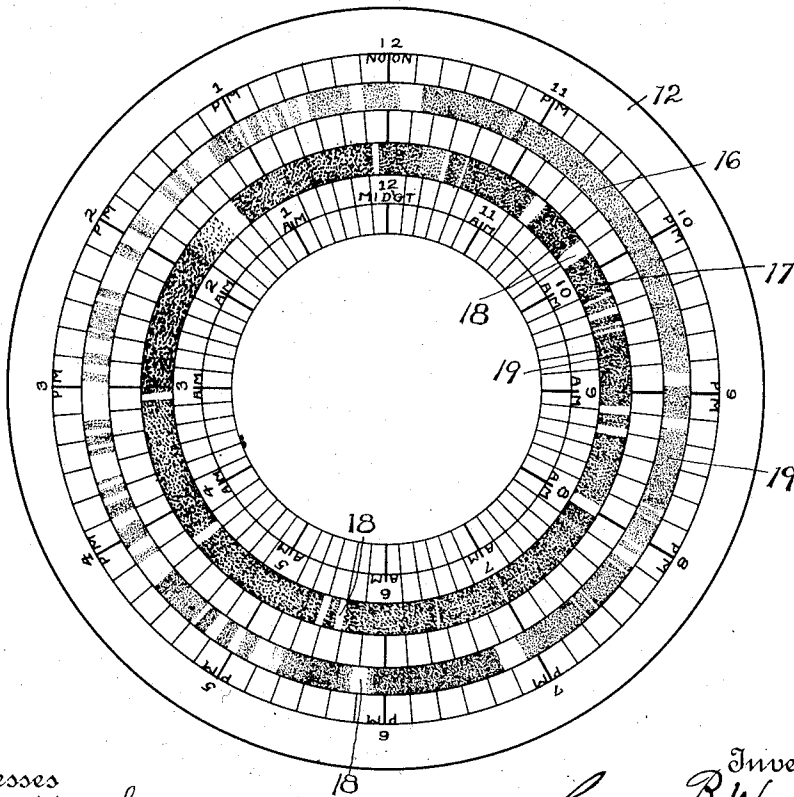


Fig. 3.



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UNITED STATES PATENT OFFICE.

CYRA BISSELL WATTLES, OF PROVIDENCE, RHODE ISLAND.

RECORDING DEVICE.

1,044,835.

Specification of Letters Patent.

Patented Nov. 19, 1912.

Application filed December 11, 1909. Serial No. 532,585.

To all whom it may concern:

Be it known that I, CYRA B. WATTLES, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Recording Devices, of which the following is a specification.

This invention is an improvement in recording devices, and more especially in that type of device wherein the record is obtained by the chemical action of light upon a sensitized medium.

At the present time, there are in force in certain localities, particularly in the larger cities, various statutes, laws, regulations, and the like, Federal and State, as well as municipal, which relate directly to what is known generally as the "smoke nuisance." This surcharge of smoke, it has been discovered, is due primarily to the irregular firing of coal-burning furnaces. To correct this state of affairs, it is proposed to exercise a careful supervision over the stokers or firemen of obtaining a continuous record of the condition of a furnace, so to speak, throughout a given period of time, which record will indicate, upon inspection, not only the number of occasions on which the furnace has stoked during that period, but also the frequency and the time of such occasions, the production of a device for obtaining such a record being the object of the invention.

A structural embodiment of the invention in its simplest form is illustrated in the accompanying drawings, whereof:—

Figure 1 is a sectional perspective view showing the application of the invention, Fig. 2 is an enlarged front elevation of the box wherein the record is made, and Fig. 3 is a detail view on a still larger scale of one of the completed records.

Reference being had to said drawings, and to the numerals marked thereon, 1 indicates in a general manner the chimney, or stack, of a boiler furnace, 2 the lighting medium, and 3 the box or "dark" chamber wherein the sensitized medium is contained, upon which medium the record is obtained by the chemical action of the light as hereinafter described.

As shown in Fig. 1, two opposite sides or walls of the chimney are formed with openings 4 and 5 exactly in alinement with each other, the openings being located at any de-

sired point in the chimney. To the exterior faces of the aforesaid walls, and directly proximal to said openings, there are secured the box 3 above mentioned, and a second box 6, the latter box having located therewithin the lighting medium 2 which, in the present instance, is constituted by an electric lamp connected up with a suitable dynamo, though any other kind of light having the requisite intensity may be substituted therefor if preferred.

That portion of the inner wall of box 3 which is exposed through the opening 4 has formed therein a pair of openings 7 and 8, one or the other of said openings, being designed to be closed by a shutter 9 which is mounted to slide in guide grooves 10 and 11 in said box wall, as shown in Fig. 2. This shutter may have any preferred size and shape, dependent upon circumstances, and guide means other than the grooves 10 and 11 may be employed in connection therewith.

Through the uncovered opening 7 or 8, the light-rays are adapted to strike against a rotating member 12 mounted centrally upon the main arbor 13 of a clock-mechanism 14 of any preferred or conventional type. In the structure illustrated, the member 12 is in the form of a dial shown in detail in Fig. 3. The working face of this dial has two concentric annuli 17 and 16 marked thereon, these annuli being each divided into twelve equal parts or divisions by radial lines, and each division in turn, into six or other numbers of sub-divisions. The main divisions indicate hours, and the sub-divisions periods of ten minutes, more or less, according to the number of sub-divisions, in each division, this being true of both annuli. The inner annulus, in the present instance, will therefore represent the hours from mid-night to noon, and the outer annulus the hours from noon to mid-night, the figures corresponding to these hours being marked on the face of the dial, as shown. The arrangement of these annuli with respect to the openings 7 and 8 is such that during the revolution of the dial caused by that of the clock arbor, the surface of the inner annulus 17 will be exposed through the lower opening 7, while the surface of the outer annulus 16 will be exposed through the upper opening 8, it being understood, however, that only one opening at a time is uncovered, the position of

the shutter being changed at noon and at mid-night. If, then, the surfaces of the two annuli be coated with any suitable sensitizing material, or otherwise rendered sensitive to light, it will be apparent that that surface which is visible through the corresponding opening 7 or 8, will, under ordinary circumstances, be acted upon during the revolution of the dial by the light beams cast by the lamp or other lighting medium. It will also be apparent that the degree of such chemical action will be materially affected by the density of the smoke passing through the chimney, the density being greatest when the furnace is freshly stoked, and decreasing subsequently until the furnace is again stoked.

The operation, therefore, is as follows: The sensitized dial is attached to the clock arbor, and the mechanism thereof then started, after which the shutter is properly adjusted, and the light turned on. If the furnace be then stoked, the density of the smoke passing up the chimney will be sufficiently great to prevent its being penetrated by the light beams, and consequently that portion of the annulus which is exposed at such time through the corresponding opening 7 or 8 will be unaffected. The density of the smoke, however, gradually decreases, while at the same time the dial continues its rotation. Consequently, as the "working" annulus passes the opening, its surface will gradually become acted upon by the light beams as the smoke becomes less dense, the extent of such action being greatest when the smoke is thinnest. When the furnace is again stoked, the then exposed portion of the annulus is again prevented from being acted upon by the increased density of the smoke. The condition of the annulus at the end of one complete revolution of the dial will thus indicate with absolute accuracy not only the number of stokings the furnace

underwent during that period, but also the exact time at which each stoking took place, it being an easy matter to determine from the relative position of the "blanks" on the annulus, (which indicate the stokings) with respect to each other, whether or not such stokings were at regular intervals apart, or at the times prescribed therefor. In Fig. 3, these "blanks" are designated by the numeral 18, while the more or less shaded portions 19 of the annuli indicate the periods or intervals between the stokings, the extent of these portions being proportionate to the duration of the intervals.

Further description of the invention, its manner of operation, and its advantages is considered unnecessary in view of the foregoing.

Having thus described my invention, I claim as new and desire to secure by Letters Patent;—

In combination with a chimney having alining openings in its opposite side walls, a source of light to the rear of one of said openings, a vertically disposed sensitized disk having spaced concentric annuli and time divisions marked thereon, a box secured to one of the side walls of the chimney, and having a pair of spaced openings located opposite the other of said openings of the chimney, a clock in said box, said disk being connected to said clock so as to be rotated thereby, said box having guide grooves, and a slide for engagement in either of the grooves to close one or the other of said box openings.

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

CYRA BISSELL WATTLES.

Witnesses:

ADA E. HAGERTY,
J. A. MILLER.