No. 813,933. PATENTED FEB. 27, 1906.

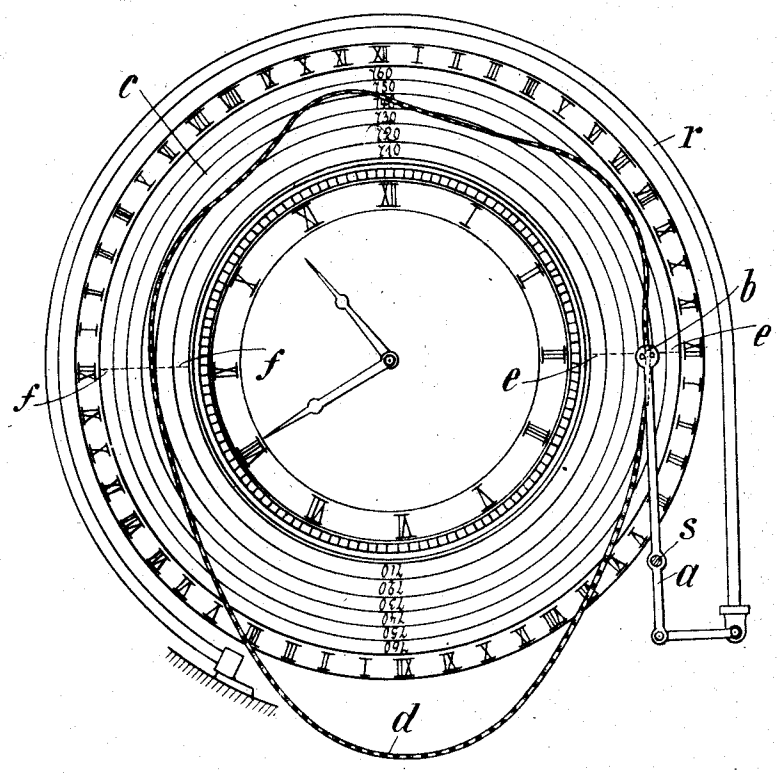
A. ABRAHAM.

AUTOMATIC RECORDING DEVICE.

APPLICATION FILED SEPT. 20, 1905.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses.

H. L. Amer.

B. Pommers

Inventor.

Adolf Abraham.

by Henry Orth & Co. Atty.

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3 SHEETS—SHEET 2.

Fig. 2.

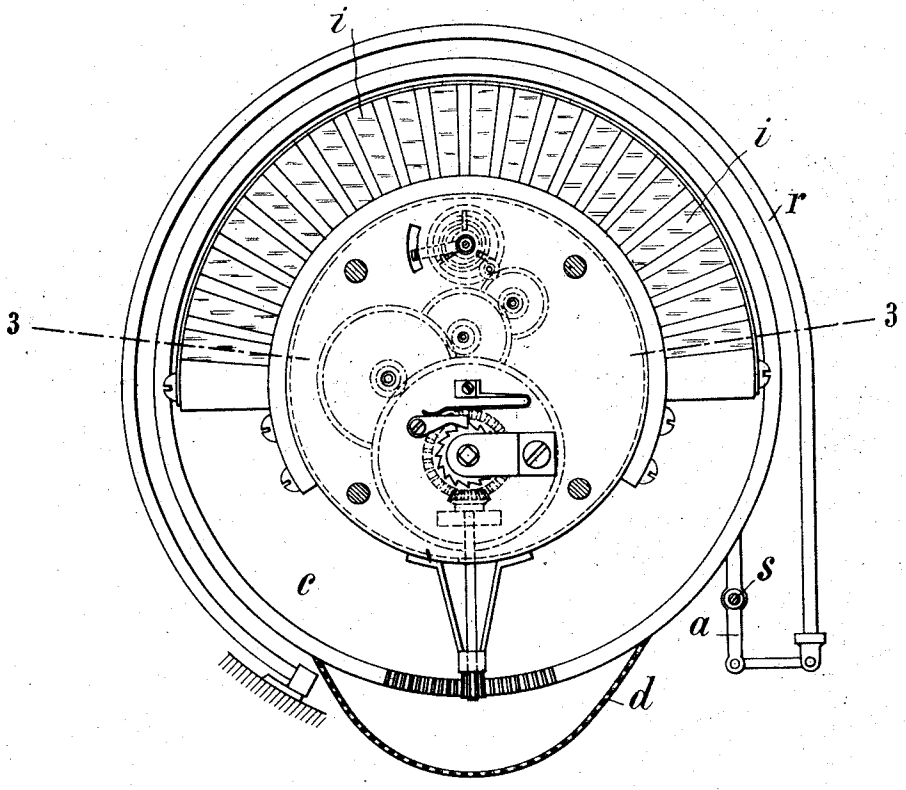
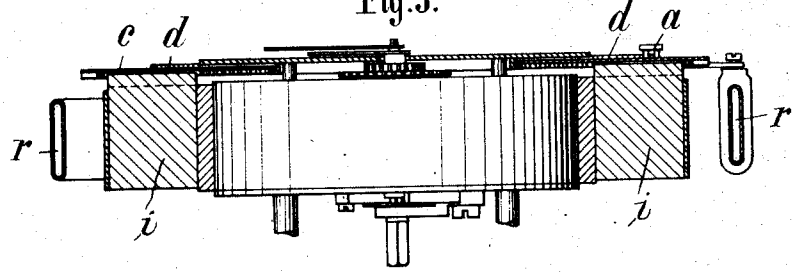


Fig. 3.



Witnesses.

H. L. Amer.

B. Hommers

Inventor.

Adolf Abraham.

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3 SHEETS—SHEET 3.

Fig. 4.

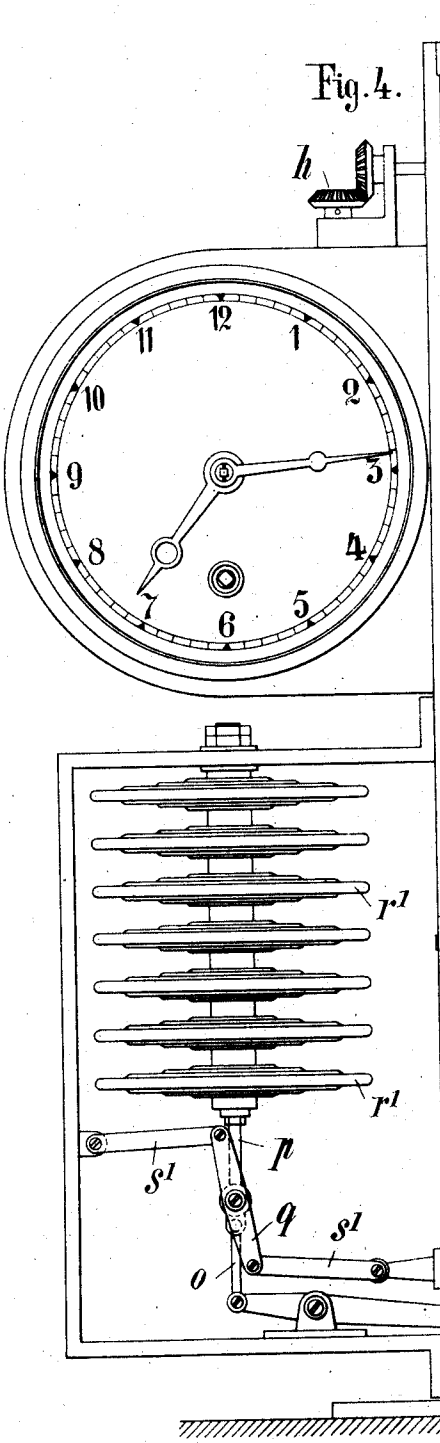
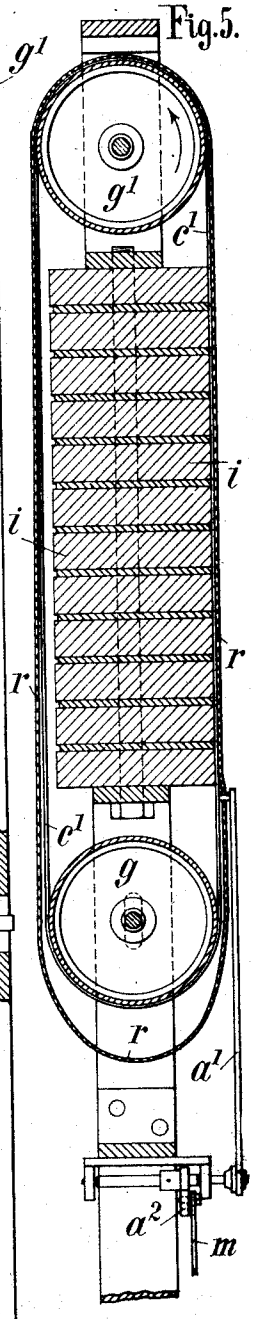


Fig. 5.



Witnesses.

H. L. Amer.

B. Rommers

Inventor.

Adolf Abraham.

by Henry Orth & Co atty

UNITED STATES PATENT OFFICE.

ADOLF ABRAHAM, OF NEUHAUS-ON-THE-OSTE, GERMANY.

AUTOMATIC RECORDING DEVICE.

No. 813,933. Specification of Letters Patent. Patented Feb. 27, 1906.

Application filed September 20, 1905. Serial No. 279,345.

To all whom it may concern:

Be it known that I, ADOLF ABRAHAM, a subject of the King of Prussia, German Emperor, and a resident of Neuhaus-on-the-Oste, Kingdom of Prussia, German Empire, (whose post-office address is Deichstrasse,) have invented a certain new and useful Automatic Recording Device, of which the following is a specification.

My invention refers to an automatic recording device which is applicable on indicators—such as barometers, manometers, thermometers, and the like.

This device enables any person to read off at any time the measurement that has been indicated before by the barometer, thermometer, or the like within a certain time expired.

Referring to the drawings, in which like parts are similarly designated, Figure 1 is one form of device embodying my invention applied to an aneroid barometer. Fig. 2 is a rear view of the same. Fig. 3 is a section on line 3 3, Fig. 2. Fig. 4 is a modification; and Fig. 5 is a section on line 5 5, Fig. 4.

In the drawings the device is shown fitted to an aneroid or metal barometer.

The barometer *r* is adapted to operate a lever *a*, which is pivoted at *s* to any fixed part—for instance, to the casing. At its free end the lever is provided with a guiding-eye *b* or any other means to guide an endless chain *d*, preferably of steel, in front of a rotatable disk *c*. By the fluctuations of the air-pressure the eye *b* will vibrate, thus guiding the chain to one or the other side. The disk *c* is rotated by a clockwork evenly about its center.

Close behind one part of the disk *c* there are one or more magnets *i*, preferably behind the upper part between the lines *e e* and *f f*. These magnets hold the links on the disk in the position they are given by the guide-eye *b* of the lever *a* when passing the line *e e*. When the links of the chain arrive at the line *f f*, the magnetic attraction ceases and the chain is released from the disk and hangs down according to its own weight until again attracted when passing the line *e e*. The disk *c* may also itself be made magnetic.

The line in which the chain is lying on the disk *c* is a registration of the height of the barometer and also of the time, corresponding circles being drawn on the disk in combination with a dial. Thus an automatic recording barometer is created, which is perfectly efficient for general use and which does away with the troublesome renewing of the paper strips and the color. All that need be done is to wind up the clockwork now and then.

In the modification shown in Figs. 4 and 5 the disk chart is replaced by an endless band chart *c'*, which passes over two drums *g* and *g'*, of which the upper, *g'*, is driven from the clockwork by means of the gearing *h*. The chain *r* is hung over the upper drum and laid on this band by the eye *b*, so that the weight of the chain is mainly carried by the upper drum *g'*. The magnets *i*, which are preferably, but not necessarily, permanent magnets, are placed within the band *c'* close to the front part, so as to allow their magnetic power to take effect on that part of the metal chain passing in front the upwardly-moving portion of the band *c'*. The lever *a'* is here of the shape of a bell-crank lever, the arm a^2 of which is connected by a link *m* to one arm of a lever *n*, the other arm being connected by a second link *o* to a bar *p*, fixed to a series of metal barometers *r'* in the shape of boxes. Since, as is known, barometers of this kind have a very little throw, six of them are shown in the drawings; but, of course, any number may be used as circumstances may require. The bar *p* is guided at its end by a lever *q*, the ends of which are rotatively fixed to links *s'*, pivoted to fixed parts on the casing.

The device may be used on other indicators. Thus if the barometer is replaced by a thermometer an automatic recording metal thermometer is created.

Instead of employing a disk any other movable surface, such as a cylinder or endless band, may be made use of.

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

1. In an automatic recording device, in combination an indicator, a clockwork, a movable surface and a chain moving together with the surface, means operated by the indicator to guide the chain on the surface.

2. In an automatic recording device, in combination an indicator, a clockwork a movable surface and a chain moving together with the surface, a lever operated by the indicator and provided with a guiding-eye to guide the chain on the surface.

3. In an automatic recording device, in combination an indicator, a clockwork, a movable surface and a chain moving to-

gether with the surface, a magnet to hold the chain to the surface, means operated by the indicator to guide the chain on the surface.

4. In an automatic recording device, in combination an indicator, a clockwork a movable disk and a chain moving together with the disk, the disk being provided with a scale, a magnet to hold the chain to the disk and a lever operated by the indicator to guide the chain on the disk.

5. In an automatic recording device, the combination with a suitable moving chart, a flexible metallic marker coöperating with the chart and magnetically held thereto, means to move the marker in accordance with the indications to be recorded.

6. In an automatic recording device, the combination with a suitable moving chart, an endless metallic chain coöperating with the chart to mark on a portion thereof the indications desired, means to position said chain on the chart in accordance with the indications to be recorded and means to create a magnetic field from the positioning means along the path of the chart for a determined distance, whereby said chain is held to the chart in the line recording the indications over a definite period of time and is automatically released from the chart after having passed said field.

7. In an automatic recording device, the combination with a chart, a driving mechanism therefor, means to produce a magnetic field extending over a portion of its path, an endless chain held to the chart by said field and means at the beginning of the field to guide the chain relatively to the chart in accordance with the indications to be recorded.

8. In an automatic recording device, a disk, a clockwork to rotate the same, said disk having concentric rulings to indicate different values and circumferential markings to indicate time, means to produce a magnetic field over the upper part of said disk between the determined time-markings, an endless chain held to said disk by said field, and an indicator moved in accordance with the indications to be recorded, to position said chain between the concentric rulings as it enters the magnetic field.

9. In an automatic recording device, the combination with a chart having parallel rulings thereon in the direction of travel of the chart and time-indicators at its edge, means to drive the chart, means to produce a magnetic field extending over a portion of its surface, an endless chain held to the chart by said magnetic field and an indicator to move the chain relatively to the rulings and in accordance with the indications to be recorded.

ADOLF ABRAHAM.

Witnesses:
HARRY RAECKNER,
ERNEST H. L. MUMMENHOFF.