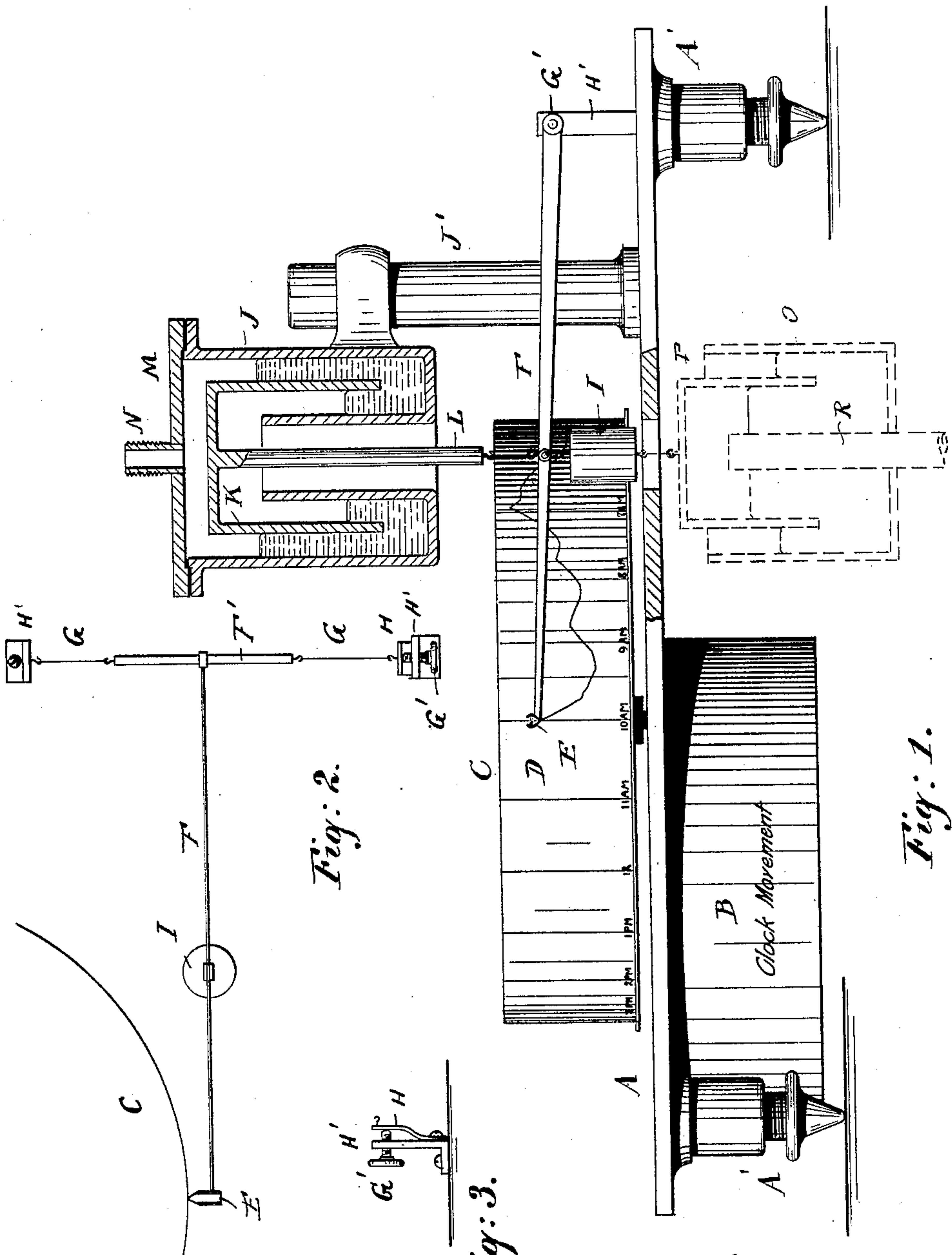


(No Model.)

A. STEINBART.
RECORDING INSTRUMENT.

No. 593,339.

Patented Nov. 9, 1897.



Witnesses
S. P. Palmer
Wm. Robbins

Fig. 3.

A. Steinbart Inventor
By his Attorney Oscar F. Smith.

UNITED STATES PATENT OFFICE.

ALFRED STEINBART, OF CARLSTADT, NEW JERSEY.

RECORDING INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 593,339, dated November 9, 1897.

Application filed May 23, 1895. Serial No. 550,395. (No model.)

To all whom it may concern:

Be it known that I, ALFRED STEINBART, a citizen of Germany, having declared my intention of becoming a citizen of the United States, and a resident of Carlstadt, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Recording Instruments, of which the following is a specification.

This invention relates to improvements in an instrument for recording variations in tensions.

The object of my invention is to provide a new and improved recording instrument which is simple in construction and records the most minute changes in tension very accurately without requiring the parts of the apparatus or the recording-sheet to be of unduly large size and which is not apt to get out of order.

In the accompanying drawings, forming a part of this specification, and in which the same letters of reference indicate the same or like parts in all the views, Figure 1 is a side elevation of my improved recording instrument, parts being in section. Fig. 2 is a plan view of part of the same, showing the means for mounting the recording-lever pivotally. Fig. 3 is a detail side view of the standard, spring, and screw.

The base-plate A is provided with the vertically-adjustable screw-legs A', by means of which said base-plate can readily be adjusted to be in horizontal position. A casing B on the under side of the base-plate contains a suitable motor, preferably a clock-movement, for rotating the cylinder C, mounted on top of the base-plate, on a vertical axis, on which cylinder the sheet D on which the record is to be traced is suitably fastened.

The tracing-pen E, of the usual construction, is fastened on the end of a lever F or tracer-holder provided at its opposite end with a transverse rod F', to the ends of which wires or cords G are fastened, which have their opposite ends fastened to springs H, resting against the ends of screws G', mounted to turn in standards H' on the base-plate. The springs hold the wires taut and can be adjusted by means of the screws G'. With this device for hanging or pivoting the lever F the friction is practically eliminated

and the spring-tension of the supporting device presses the tracing-pen with sufficient force against the paper to trace a line. A weight I is suspended from the lever F a greater or less distance from its free end, the weight being selected according to the requirements, as will appear hereinafter.

A deep annular vessel J contains the bell-float K, which dips into and floats in mercury in said vessel J, and said bell-float is provided with a stem L, which projects through the central opening or neck of the vessel J and has its lower end connected with the lever F. The vessel J is provided with a tight-fitting cover M, having an upwardly-projecting neck N, with which a pipe is to be connected for transmitting the tension of the gas or other medium of which the variation, in tension are to be recorded to the said vessel J.

In some cases the lever F may be connected with a bell P (shown in dotted lines in Fig. 1) and suspended from said lever F, which bell dips into a liquid in a vessel O, into the upper part of which a pipe R leads.

The operation is as follows: As soon as a reduction in tension takes place in the vessel J the bell-float K is raised by the greater pressure of the exterior air, and as soon as an increase in tension takes place bell-float K descends, the tracer E being moved accordingly and tracing a corresponding line on the sheet D, which is rotated uniformly and at a certain speed by the clock-movement.

In many cases it is desirable to eliminate the record until a change in tension to a certain degree is reached, for the purpose of making the chart clear and distinct and showing the variations in tension on a larger and more distinct scale. The weight I, which is suspended from the lever F, is so selected that the change in tension required to overcome this weight corresponds to that part of the variation that is not to be recorded. For example, when the scale is not to record any changes until a suction of ten inches of water-head is obtained the weight must be so selected that a suction up to ten inches of water-head is required to overcome said weight, and any additional suction produced serves to raise the weight still higher, and with it the tracer. The record of such changes in tension greater than the suction required to raise

the weight will only be traced, and as soon as the suction falls below that required for lifting the weight the tracer will remain in its bottom position. Thus by using a proper
5 weight the record of the changes up to any desired degree can be eliminated from the record.

In some cases it is desirable to have the instrument influenced by the difference in tension between a gas in its normal state and a gas after the same has been subjected to the influences of chemicals for the purpose acting on some of the constituents, by which action the tension of gas is affected, and in this case
15 the gas, in its original state, is conducted through the pipe R (shown in dotted lines) into the vessel O and the gas that has been acted upon is conducted into the vessel J. If the gas in its original composition is under
20 suction, it tends to draw down the lever F, thereby affecting the line traced accordingly, and if it is under pressure it relieves the lever F of the weight of the bell P and affects the line traced accordingly.

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

1. In an instrument for recording the variations in the tension of gases, the combination
30 with a vessel closed at the top and having an

upwardly-projecting neck at its bottom which neck is open at the top, a liquid-seal plunger in said vessel, a rod extending from said plunger through the bottom neck of the vessel and a tracer connected with said rod and a movable support for paper on which the tracer
35 can trace substantially as herein shown and described.

2. In an instrument for recording the variations in the tension of gases, of a vessel closed
40 at the top and having an upwardly-extending neck in its bottom which neck is open at its top, a tube connected with the upper part of the vessel and serving for conveying the gas of which the variations in tension are to be
45 recorded, into said vessel a bell-shaped liquid-seal plunger in said vessel, a rod extending from said seal-plunger down through the neck in the vessel, a tracer on said rod and a movable support for a sheet on which a record is
50 to be traced by said tracer, substantially as herein shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 15th day of May,
55 1895.

ALFRED STEINBART.

Witnesses:

OSCAR F. GUNZ,

D. PETRI-PALMEDO.