No. 639,180.

Patented Dec. 12, 1899.

F. W. MARTIN.

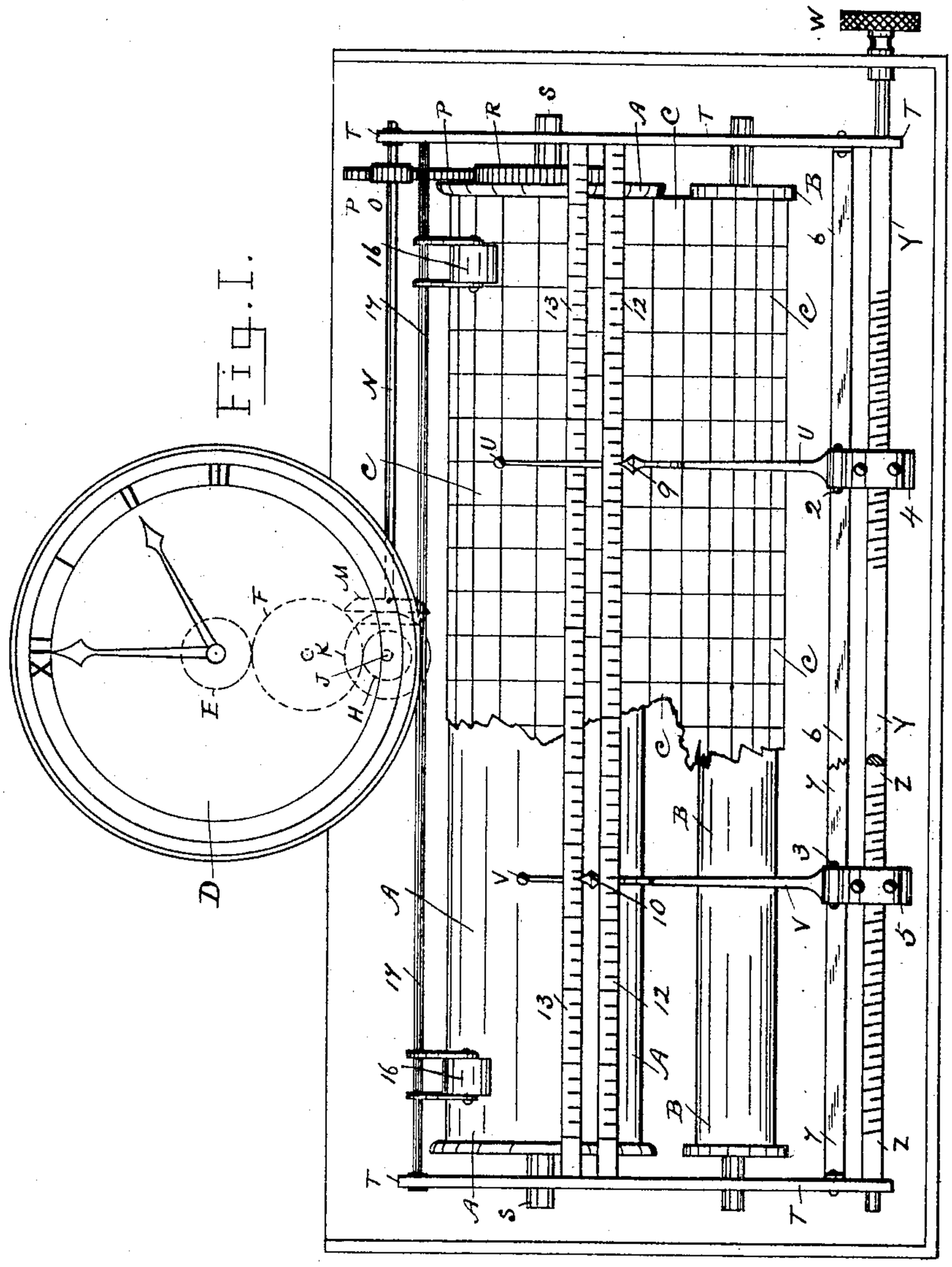
AUTOMATIC RECORDER.

(Application filed June 9, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



Witnesses.
B. E. Herald
Jas. A. Harvey.

Inventor.
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(No Model.) 2 Sheets—Sheet 2.

Fig. II.

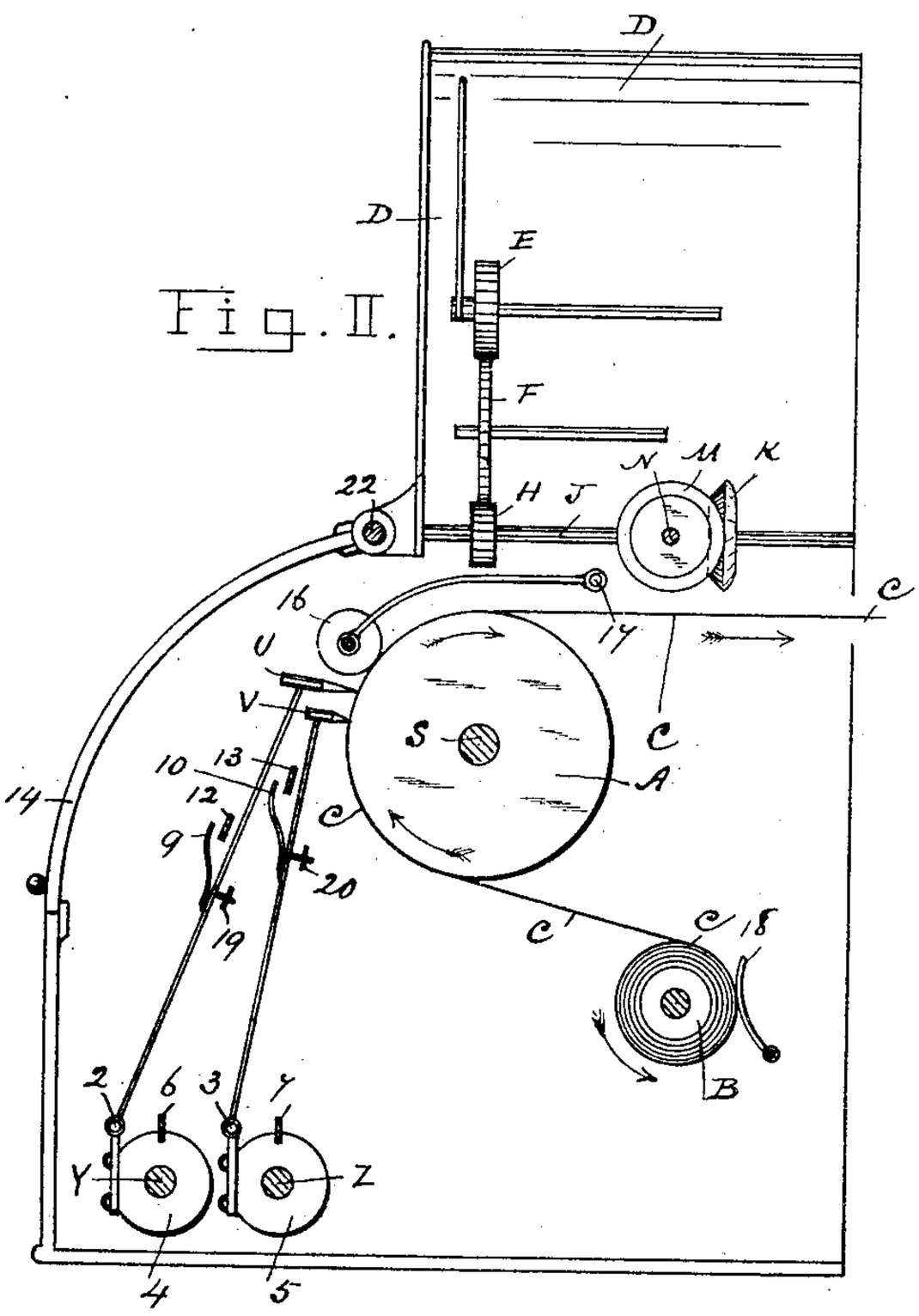
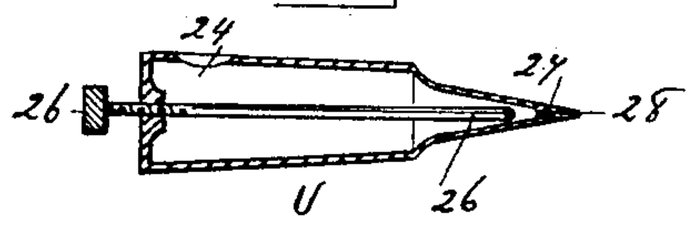


Fig. III.



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UNITED STATES PATENT OFFICE.

FREDERICK W. MARTIN, OF HAMILTON, CANADA.

AUTOMATIC RECORDER.

SPECIFICATION forming part of Letters Patent No. 639,180, dated December 12, 1899.

Application filed June 9, 1899. Serial No. 719,923. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. MARTIN, a citizen of Canada, residing at Hamilton, in the county of Wentworth, in the Province of Ontario, Dominion of Canada, have invented new and useful Improvements in Automatic Recorders, of which the following is a specification.

My invention relates to automatic recorders for registering or plotting load curves, such as the daily output of an electric light or power station.

The objects of my invention are, first, to record one or more curves on the same sheet by using one or more pens and different-colored inks, such as the load of an incandescent switchboard, power-board, or any other supply; second, to provide a machine which shall be a check on the switchboard attendant; third, to supply the machine with a long ribbon of paper from a roll with sufficient paper to last several days, and, fourth, to afford facilities for the running of the machine continuously for several days by means of a clock connection, so as not to want attention except from the outside. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of the machine, showing the two rollers partially covered by the ribbon-paper, which is divided off into horizontal parallel lines and transverse parallel lines, each set of lines of equal distance apart, said rollers capable of revolving by means of mechanism connected to a clock. Fig. 2 is an end elevation through the right-hand end of the roller, showing the two adjustable marking-pens and one of the tension-rollers. Fig. 3 is an enlarged sectional view of an ink-marking pen detached.

Similar letters and numerals refer to similar parts throughout the several views.

In the drawings, the ribbon-paper roller is indicated by A, the ribbon-feed roll by B, and the right-angle-line-divisioned paper by C. This ribbon-roller A is driven by the clock D by means of a system of gear-wheels commencing with the clock's central spur-wheel E, which gears into a spur-wheel F, which drives the small spur-wheel H on transverse shaft J, and thence the miter or bevel wheel K on same shaft. Said wheel K drives a similar wheel M on shaft N, and consequently the pinion-wheel O on same shaft, said pinion driving a rear spur-wheel P, which drives the spur-wheel R on the shaft or spindle S of the roller A. This particular system of gear-wheels I do not especially claim, as a somewhat different system, comprising more or less wheels and of various sizes, may be employed to attain the desired result of revolving once in a given period of time the large ribbon-roller by means of clock connection. It is intended that this roller A shall revolve once in a period of twenty-four hours, more or less, according to requirements. This paper may be cut off as desired when passing through the rear part of the machine. The roller A and the feed-roll B are supported by the end frames T, and when the roller A is revolved the lined ribbon is drawn from the feed-roll B.

The marking-pens U and V for plotting various curves on the ribbon C in different-colored inks mark the ribbon automatically as the roller A revolves and are capable of traveling on the ribbon when actuated by means of an outer hand-wheel, as W, which revolves the screw Y, and hence the ink-regulating pen U, longitudinally. The ink-regulating pen V is actuated in the same manner and by similar means on its longitudinal screw Z. These ink-regulating pens are pivoted at 2 and at 3 to their respective hubs 4 and 5, and to prevent the same from turning when operated upon by their respective hand-wheels the said hubs are slotted in order to slide on their respective rigid guides 6 and 7, which extend from end to end of the end frame T and T. These pens have each an index indicating-finger 9 and 10, respectively, to point to divisioned numerals and parts on the longitudinal bars 12 and 13, which extend from end to end of the frame. The said numerals and divisioned parts or lines on the bar 12 denote volts, and the divisioned numerals and lines on the bar 13 denotes ampere. To these volts and amperes the fingers 9 and 10 point when operated by their respective hand-wheels W, each separately at any given time of the clock D, or both together, as the case may be. The colored marks on the ribbon-paper C, made by these pens U and V, and the indications of the fingers 9 and 10 on their

respective bars 12 and 13 are clearly seen by the fact of the hinged and locked bowed front part 14 of the outer casing being made of glass.

Immediately above the pens referred to and on the ribbon on the roller A a tension roller or rollers 16 are employed to assist in retaining the ribbon in smooth position on the roller. These tension-rollers are capable of being slid on their longitudinal and rigid bar 17, which, with the guide-bars 6 and 7, act as stays and braces for the ends T and T of the frame in which the said rollers revolve. The feed-roll B has a tension-spring 18, and the pens V and U are supplied with small tension-weights 19 and 20, respectively.

The outer casing, the glass front part of which is hinged at 22, may be made of various shapes and proportions and of chaste design to suit the requirements of the objects set forth.

The pens referred to are supplied with openings 24, as seen in the enlarged view, Fig. 3, of the drawings, for purposes of filling with ink, and also a headed screw 26, that the same when operated may regulate the flow of ink through the small aperture 27 through the point 28 of the pen. These pens may be used with or without the ink-regulator.

This automatic recording-machine is very useful for plotting the load curves of the different outputs of a station. The pens work over a scale of amperes and use different-colored ink, which makes them distinct and easy to trace. One can be plotting an incandescent while the other one may be plotting a power load. Besides being a reference for the office and to have on file, it is a check on the switchboard attendant, as the charts move over a roller which is geared to a clock and keeps the charts moving at the same rate as time. The pens, resting on the chart, record the load and can be moved from left to right, according to the variations. The charts may be laid off into fifteen-minute readings, unless otherwise wanted. The attendant cannot record the readings, as is sometimes done, by jotting down several readings from memory. The recorder carries a supply of charts, which are on a roller under the large roller and are passed out at the rear in the most approved way. Considering that the casing of this recorder can be locked up by the foreman or superintendent, the attendant can only by permission get access to refill the pens, which will run about a week without refilling.

Various changes in the form, proportion, and minor details of my invention may be resorted to without departing from the spirit and scope thereof. For instance, one pen only may be used to mark the suitably-right-angled lined ribbon-paper, or more than two, as shown, may be used and the ribbon-rollers arranged suitably to operate therewith.

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

1. An automatic recorder for plotting load curves as the output of electric light and power, comprising a paper-ribbon roller in a suitable casing, a clock attached to said casing and connected to a gear-wheel at one end of said roller to revolve the same once in a period of time and continuously, a paper-feed roll revolved by said roller to supply right-angled-line-divisioned paper to the same, inking-pens pivoted to independent hubs, and capable of longitudinal movement on longitudinal screws operated by outer hand-wheels, guides for said hubs, pointers on said inking-pens and longitudinal index-bars between said pens and pointers, as described.

2. An automatic recorder as described, comprising a paper-ribbon roller, a clock connected to the end wheel of said roller to revolve the same once in a period of time and continuously, a paper-ribbon-feed roll revolved by said roller, inking-pens pivoted to hubs on independent longitudinal screws, pointers on said inking-pens, longitudinal index-bars between said pens and pointers, longitudinal guides for said hubs, outer hand-wheels to revolve said screws, and tension-rollers on the said paper-ribbon roller.

Signed at Hamilton, Canada, May 31, 1899.

FREDERICK W. MARTIN.

In presence of—
JOHN H. HENDRY,
B. E. HERALD.