J. C. STEVENS.

RECORDING WATER GAGE.

APPLICATION FILED FEB. 3, 1917.

1,303,126.

Patented May 6, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

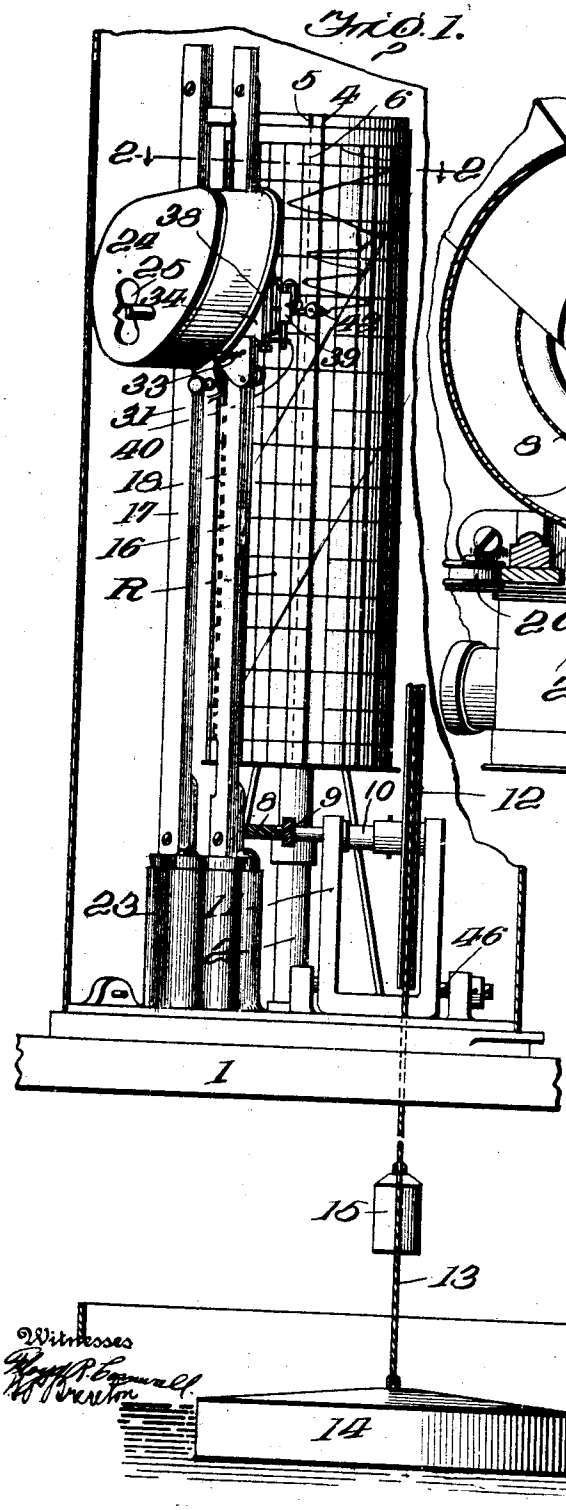
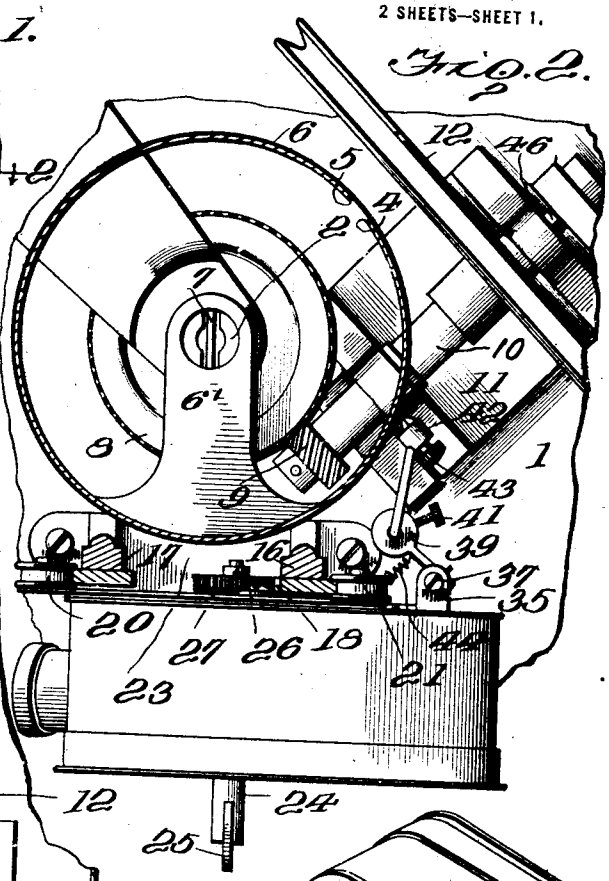


Fig. 2.



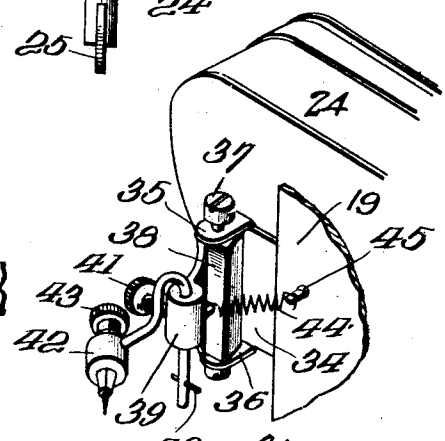


Fig. 3.

Witnesses

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2 SHEETS—SHEET 2.

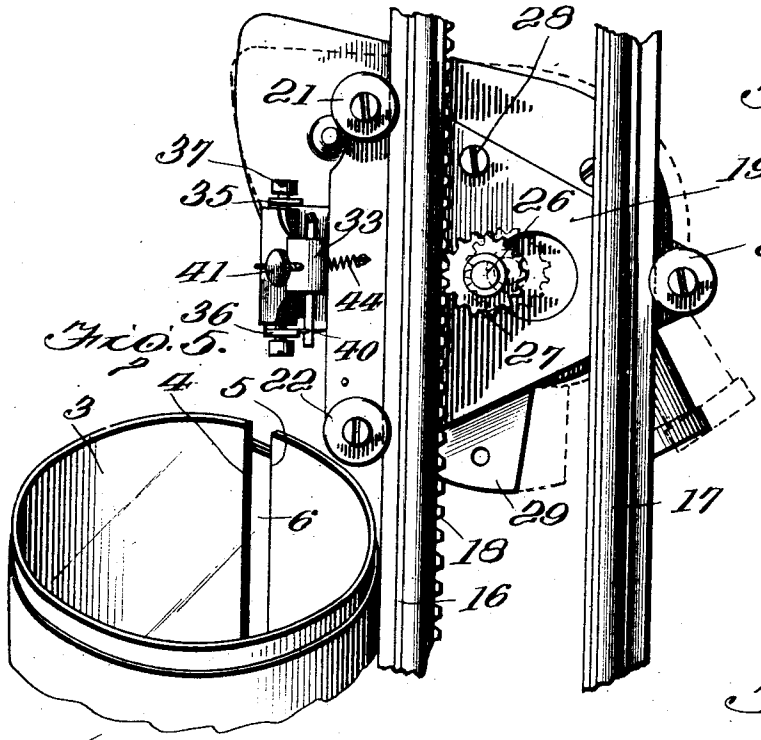


Fig. 4.

Fig. 5.

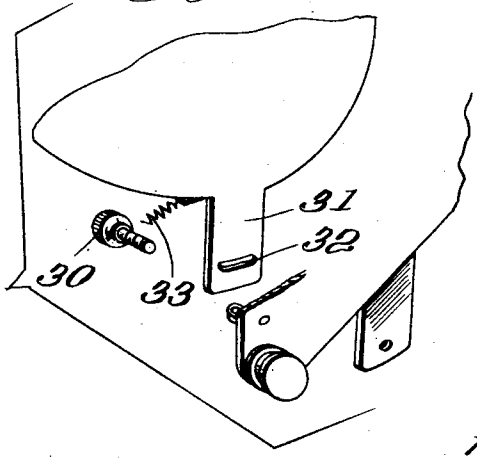


Fig. 6.

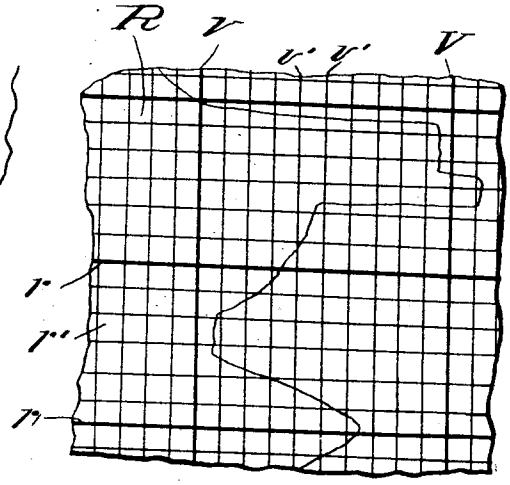


Fig. 7.

Witnesses

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RECORDING WATER-GAGE.

1,303,126. Specification of Letters Patent. Patented May 6, 1919.

Application filed February 3, 1917. Serial No. 146,460.

To all whom it may concern:

Be it known that I, JOHN C. STEVENS, a citizen of the United States, residing at Portland, in the county of Multnomah, State of Oregon, have invented certain new and useful Improvements in Recording Water-Gages, of which the following is a description, reference being had to the accompanying drawing and to the figures of reference marked thereon.

The invention relates to new and useful improvements in recording water gages, and more particularly to a device of this character wherein the water stage may be recorded throughout a period of several days.

An object of the invention is to provide a recording water gage which shall be very reliable and which shall also be durable and simple in construction.

Another object of the invention is to provide a water gage of the above character wherein the cylinder supporting the recording sheet is so constructed that the sheet may be quickly applied thereto, and when applied said cylinder will hold the sheet taut and in place thereon.

A further object of the invention is to provide a recording water gage of the above character which is provided with a pencil carriage supporting the clock, which carriage travels down a rack traversing the length of the cylinder in a given time.

A still further object of the invention is to mount the clock in an adjustable case and, at the same time, provide a small gear operating the clock which may be engaged with or disengaged from the rack to facilitate the setting of the pencil at any position on the record sheet.

A still further object of the invention is to provide means for holding the pencil so as to allow vertical adjustment thereof and also a variable tension on the pencil.

These and other objects will in part be obvious and will in part be hereinafter more fully disclosed.

In the drawings, which show by way of illustration one embodiment of the invention:—

Figure 1 is a view, partly in section and partly in front elevation, showing a recording water gage embodying my improvements;

Fig. 2 is a view, partly in plan and partly in section, on the line 2—2 of Fig. 1;

Fig. 3 is a perspective view showing the devices for supporting the pencil on the carriage which supports the clock;

Fig. 4 is a view showing the supports, the vertical rack, the carriage, and the clock with the gear operated by the clock in mesh with the rack, and in dotted lines the clock shifted to remove the gear from engagement with the rack;

Fig. 5 is a perspective view of the upper part of the cylinder for supporting the record sheet;

Fig. 6 is a detached perspective view of the parts which permit the clock to be shifted to remove the gear from mesh with the rack; and

Fig. 7 is a detail showing a small section of the record sheet.

The invention consists broadly in a supporting base having a vertical standard on which is mounted a cylinder for supporting the record sheet. This record sheet is cylindrical in form, and the cylinder is split and is formed of metal so that the cylinder will hold the record sheet thereon. Adjacent the record cylinder are vertical supports on which a carriage is mounted to move vertically, and this carriage supports a clock which is completely housed by a dust-proof casing. Extending through one wall of the casing is a shaft driven by the clock and carrying a gear adapted to mesh with a vertical rack. Mounted on the carriage is a pencil which is adapted to engage the record sheet, and the carriage is caused to travel down the record sheet at a uniform speed covering the vertical length of the record sheet in a given period of time, as, for example, eight days. The clock is attached to the supporting carriage so that it may be shifted by withdrawing the gear from mesh with the rack for the purpose of setting the pencil. The cylinder is rotated by a float following the level of the water, and the combined movements of the pencil and of the cylinder produces a record of the water stage.

Referring more in detail to the drawings:—

The invention consists in a recording water gage having a supporting base 1 on which is mounted a vertical shaft 2. This

vertical shaft is supported so as to rotate in suitable bearings. Supported by the shaft is a cylinder or drum 3 which supports the record sheet. This cylinder or drum is formed of spring metal having vertical spaced edges 4 and 5, thus forming a slot 6 extending from end to end of the cylinder. The cylinder or drum is carried by supporting arms, one of which is indicated at 6′ in Fig. 2, and in these arms is mounted a sleeve having a pin 7 at its upper end adapted to rest in a V-shaped notch in the upper end of the vertical shaft 2. Through this connection, the cylinder or drum is caused to rotate with the vertical shaft. The vertical shaft is provided with a worm gear 8 which meshes with a worm gear 9 on a horizontal shaft 10 mounted in a suitable supporting bracket 11. The shaft 10 carries a wheel 12. A cord or other flexible member 13 extends about the wheel 12 and is connected at one end to a float 14, while the other end thereof is connected to a counterbalance 15. The float 14 is moved up and down as the water level varies, and this will cause the wheel 12 to rotate, which in turn will rotate the vertical shaft, and the drum or cylinder supported thereby. It will, therefore, be apparent that the drum or cylinder will be given movements about a vertical axis, which movements are determined by and correspond exactly with the changes in the water level.

Located at one side of the drum or cylinder 3 are vertical supporting bars 16 and 17. Attached to the bar 16 is a rack 18. Mounted to move vertically on the bar 17 is a carriage 19. This carriage is provided with grooved rollers 20, 21 and 22, which are adapted to engage the edges of the bars 16 and 17, and this permits the carriage to move readily vertically on the supporting bars. The bars are suitably connected at their upper ends, and their lower ends are mounted on a standard or bracket 23. Supported by the carriage 19 is a dust-proof casing 24, in which is mounted a clock mechanism. The clock mechanism may be wound by a suitable finger piece 25. A shaft of the clock mechanism, indicated at 26, projects through the casing 24 and carries a gear wheel 27. The casing 24 carrying the clock mechanism is pivoted at 28 to the carriage 19. The carriage has a depending arm 29 which carries a set-screw 30. The casing 24 has a depending arm 31 with a slot 32 formed thereon through which this set-screw is adapted to extend. A spring 33 is attached at one end to the casing and at the other end thereof to the carriage 19, and this spring is so disposed as to normally turn the casing 24 carrying the clock mechanism therein so as to hold the gear 27 in mesh with the rack 18. The parts are locked in this position by the set-screw 30. It will be readily seen, however, that by loosening the set-screw 30 and shifting the clock supporting case 24 from the position shown in full lines in Fig. 4 to the position shown in dotted lines therein, the gear 27 is moved to a position out of mesh with the vertical rack 18, and this will permit the carriage to be freely moved up and down.

Mounted on the carriage 19 is a pencil holding device which consists of a bracket 34 having horizontally extending lugs 35 and 36 each of which is provided with a bearing pivot screw 37. A supporting plate 38 is pivotally mounted on these pivot screws 37 and is free to turn about a vertical axis. This supporting plate has a sleeve 39. A rod 40 is mounted in said sleeve and is held in vertical and horizontal adjusted positions by a set-screw 41. This rod is bent laterally at its upper end and carries a second sleeve 42 in which is mounted a pencil holder 43. A spring 44 is connected at one end to the supporting plate 38 and at its other end to a lug 45 on the carriage. This spring normally tends to press the pencil into contact with the record sheet. The position of the pencil may be shifted vertically relative to the carriage by loosening the set-screw 41 and moving the rod 40 vertically in the sleeve 39. The position of the pencil relative to the supporting plate for varying the pressure of the pencil against the record sheet may be likewise accomplished through loosening the set-screw 41 and turning the rod 40 angularly about its vertical center in the sleeve 39.

The record paper or sheet, indicated at R in the drawings, is graduated into eight horizontal divisions in the present embodiment of the invention, each representing one day, and each day is sub-divided into twelve parts, thus making the smallest division of the time scale two hours, and this readily permits the time to be read as close as fifteen minutes with ease. In Fig. 7 of the drawings, these horizontal divisions are indicated at r, while the sub-divisions are indicated at r'. The record sheet is also divided vertically into inches and tenths of inches by vertical lines. The main divisions are indicated at v in the drawings, and the sub-divisions at v'.

The paper is supplied in cylindrical form. The paper is first made the length desired to give the circumference of the drum the proper radius with the circumference of the grooved pulley or wheel actuated by the water level. The drum or cylinder 3 is pressed or reduced in size so as to bring the edges 4 and 5 substantially together and then the cylindrical sheet is slipped over the drum, and when the drum is released it will spring out into engagement with the record sheet and grip the same. This affords an extremely easy manner of placing

the record sheet on the drum and insures that the drum shall be of accurate size for giving a proper record. So far as this feature is concerned, it will be understood that the construction of the drum and record sheet may be used with a horizontally disposed drum as well as with a vertically disposed drum.

The clock is wound and the carriage set with the pencil at the upper end of the drum or cylinder and properly positioned, relative to the recording sheet. The position of the pencil may be brought about by shifting the pencil on the carriage, or by withdrawing the gear of the clock mechanism from engagement with the rack and shifting the carriage to properly position the pencil, after which the gear is permitted to engage the rack. After the pencil has been properly set and the clock mechanism is wound, the carriage will travel down the vertical supporting rods therefor through the action of gravity thereon, and the clock mechanism will permit the downward movement of the carriage at a uniform rate of speed which corresponds to the graduations of the record sheet so that the pencil will travel from one line r to another line r in twenty-four hours. During this traveling of the pencil, the cylinder will be rotated through the action of the float 14 thereon, and this will cause the water level to be recorded on the sheet so that the water stage may be readily determined from the record sheet at any instant during the period of time that the pencil is traveling from the upper end of the sheet to the lower end thereof.

The bracket 11 carrying the horizontal shaft 10 is pivoted at 46, and a suitable spring normally tends to shift the bracket 11 so as to hold the worm gear 9 in mesh with the worm gear 8 so as to prevent any lost motion in the movements of the drum or cylinder.

From the above, it will be apparent that the clock mechanism is located entirely within the dust-proof casing, which not only protects the same, but which enables the entire clock mechanism to be readily removed and another substituted therefor. By removing the holding set-screw and the pivot screw for the inclosing casing for the clock mechanism, the clock mechanism may be taken off from the apparatus and another substituted in place thereof, as above noted.

It is obvious that minor changes in the details of construction and the arrangement of parts may be made without departing from the spirit of this invention, as set forth in the appended claims.

Having thus described the invention, what is claimed as new is:—

1. A recording water gage including in combination, a supporting base, a drum mounted to rotate about a vertical axis and carrying a recording sheet, devices actuated by the water level for rotating the drum, a carriage movable vertically by gravity adjacent said drum, a pencil supported by the carriage, and a clock mechanism mounted on the carriage for timing the downward vertical movements of the pencil.

2. A recording water gage including in combination, a supporting base, a drum mounted to rotate about a vertical axis and carrying a recording sheet, devices actuated by the water level for rotating the drum, a carriage movable vertically by gravity adjacent said drum, a pencil supported by the carriage for engaging the recording sheet, a clock mechanism mounted on the carriage for timing the vertical downward movements of the pencil, and a dust-proof inclosing casing for the clock mechanism.

3. A recording water gage including in combination, a supporting base, a drum mounted to rotate about a vertical axis and carrying a recording sheet, devices actuated by the water level for rotating the drum, spaced vertical bars, a carriage having guiding rollers adapted to engage said bars for guiding said carriage vertically, a pencil mounted on the carriage and adapted to engage the recording sheet, a clock mechanism mounted on the carriage, a gear connected with the clock mechanism, one of said vertical rods having a rack adapted to be engaged by the gear whereby the clock mechanism may be used for timing the downward vertical movements of the pencil.

4. A recording water gage including in combination, a supporting base, a drum mounted to rotate about a vertical axis and carrying a record sheet, devices actuated by the water level for rotating the drum, supporting devices adjacent the drum, a carriage mounted on said supporting devices to move vertically, a pencil mounted on the carriage for engaging the record sheet, a dust-proof casing pivoted to the carriage, a clock mechanism located in said casing and having a shaft extending through the casing and supporting a gear, and a vertical rack bar with which said gear coöperates whereby the clock mechanism may operate to time the downward vertical movements of the pencil.

5. A recording water gage including in combination, a supporting base, a drum mounted to rotate about a vertical axis and carrying a record sheet, devices actuated by the water level for rotating the drum, supporting devices, a carriage traveling vertically on said supporting devices, a pencil mounted on said carriage and adapted to engage the record sheet, a casing pivoted to the carriage, a clock mechanism within said casing having a shaft carrying a gear, a vertical rack bar with which said gear is

adapted to mesh, and means for holding the casing with the gear in mesh with the rack bar or for permitting the casing to be swung to move the gear out of mesh with the rack bar.

6. A recording water gage including in combination, a supporting base, a drum mounted to rotate about a vertical axis and carrying a record sheet, devices actuated by the water level for rotating the drum, supporting devices, a carriage movable vertically on said supporting devices, a pencil supported by the carriage and adapted to engage the record sheet, a projecting arm mounted on the carriage, a casing pivotally attached to the carriage and having a projecting arm adjacent the projecting arm on the carriage, a set-screw for clamping the arms together, a clock mechanism located within the casing and having a projecting shaft carrying a gear adapted to mesh with a vertical rack bar.

7. A recording water gage including in combination, a supporting base, a drum mounted to rotate about a vertical axis and carrying a recording sheet, devices actuated by the water level for rotating the drum, a carriage supported to travel vertically by gravity, a bracket mounted on said carriage, a supporting plate pivoted to the bracket, a rod connected to said supporting plate and carrying a pencil, said rod being adjustable in said supporting plate, and a spring for moving the supporting plate to cause the pencil to press against the record sheet.

8. A recording water gage including in combination, a supporting base, a drum mounted to rotate about a vertical axis and carrying a record sheet, devices actuated by the water level for rotating the drum, a carriage mounted to move vertically by gravity, a timing mechanism for controlling the movements of the carriage, a bracket mounted on the carriage, a supporting plate pivoted to the bracket, a rod mounted in the supporting plate so that it may be shifted vertically or swung about a vertical axis, a pencil carried by said rod and adapted to engage the record sheet, and a spring connected to the supporting plate for pressing the pencil against the record sheet.

9. A recording water gage including in combination, a drum mounted to rotate and carrying a record sheet, devices actuated by the water level for rotating the drum, a carriage movable parallel with the axis of the drum, a pencil supported by the carriage, and removable clock mechanism mounted on the carriage for timing the travel of the carriage along the drum.

In testimony whereof I affix my signature in the presence of two witnesses.

JOHN C. STEVENS.

Witnesses:
C. E. ELLSWORTH,
J. B. WOODWARD.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."