

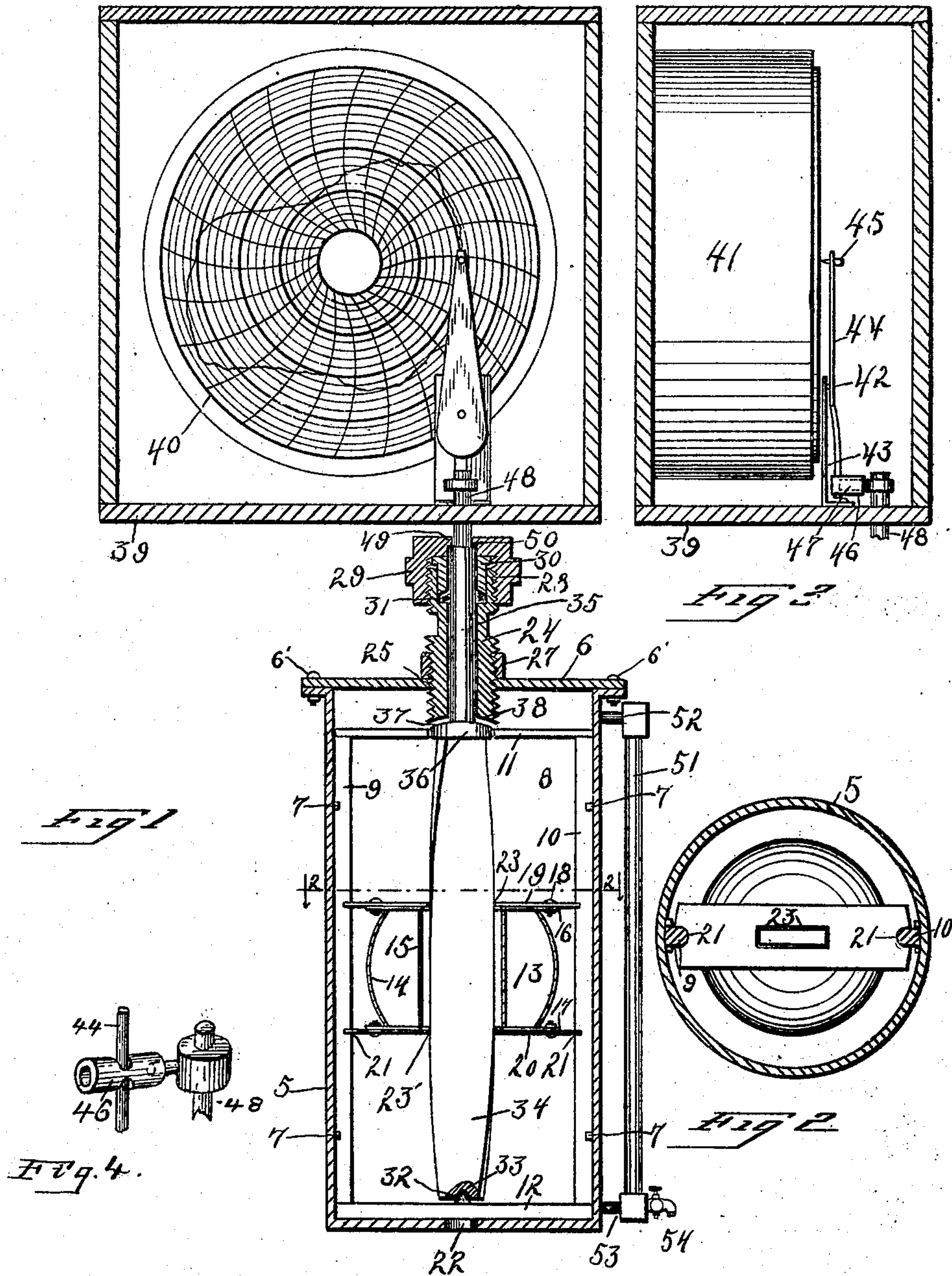
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T. S. HARDESTY & S. STEWART.

RECORDING WATER GAGE.

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THORNTON S. HARDESTY, OF RIVESVILLE; AND SCOTT STEWART, OF FAIRMONT, WEST VIRGINIA.

RECORDING WATER-GAGE.

No. 848,102.

Specification of Letters Patent.

Patented March 26, 1907.

Application filed October 21, 1905. Serial No. 283,855.

To all whom it may concern:

Be it known that we, THORNTON S. HARDESTY and SCOTT STEWART, citizens of the United States, residing, respectively, at Rivesville and Fairmont, in the county of Marion and State of West Virginia, have invented certain new and useful Improvements in Recording Water-Gages, of which the following is a specification.

Our invention relates to an indicating and recording device for indicating and recording the height of water in steam-boilers.

The object of the invention is the provision of a device of the character described, so constructed as to indicate the height of the water in the boiler at all times and to keep a permanent record of the fluctuations in the height of said water.

A further object of the invention is the provision of means whereby the bearing portions of the device may be packed while the boiler is under a full head of steam.

Further objects and advantages of the invention will be set forth in the detailed description which now follows:

In the accompanying drawings, Figure 1 is a vertical sectional view of an indicator and recorder constructed in accordance with our invention. Fig. 2 is a horizontal section upon line 2 2 of Fig. 1 looking in the direction indicated by the arrows. Fig. 3 is a transverse section of a casing containing a chart-actuating device which will be hereinafter described, and said view also illustrates connections between a recording-point and the main stem of the recorder. Fig. 4 is a detailed perspective view of the compensating connections between the indicator and the actuating mechanism therefor.

Like numerals designate corresponding parts in all of the figures of the drawings.

Referring to the drawing, the numeral 5 designates a casing, the top of which is provided with a closure 6, which is bolted at 6' to said casing. Pins 7, carried by casing 5, form channels for the reception of a rectangular guide-frame 8. This frame comprises the side bars 9 and 10 and the upper and lower connecting-bars 11 and 12, slidably disposed for vertical movement. Mounted upon the side bars 9 and 10 is a float 13. This float comprises an annular wall 14, an annular core 15, and cap-plates 16 and 17, which are soldered to wall 14 and core 15 to

form a hollow chamber. Bolted to plates 16 and 17, as at 18, are the bars 19 and 20, having recesses 21 formed in their ends, whereby said bars are adapted to engage side bars 9 and 10 and to be guided thereby. The opening 22, formed in the bottom of casing 5, provides an entrance for water from the boiler. Bars 19 and 20 have rectangular slots 23 and 23' formed therein. A bearing member 24 is threaded, as at 25, into plate 6 and is held against movement therein by a lock-nut 27. The upper portion of bearing member 24 is threaded, as at 28, for the reception of a packing-nut 29, which is adapted when screwed upon said bearing member 24 to press a gland 30 into engagement with packing 31 to thereby provide a steam-tight joint at that point.

Carried by the connecting-bar 12 of frame 8 is a conical bearing-point 32, adapted to engage a recess 33, formed in the lower end of a twisted member 34. Member 34 passes through float 13 and through the slots 23 and 24 of bars 19 and 20. Member 34 is twisted in such a manner that vertical movement of the float 15 in casing 5 will impart a partial rotative movement to a stem 35, which has its bearing in member 24. A collar 36, which is integral with member 34 and stem 35, is formed at the juncture of said member and stem and has a convex upper face 37, adapted to receive the concaved lower end 38 of bearing member 24.

By virtue of the construction just recited it is possible to apply new packing to bearing member 24 while the boiler is under a full head of steam. To accomplish this object, lock-nut 27 is loosened and bearing member 24 is screwed down in closure 6 until its concaved lower end is forced into close engagement with the convex face 37 of collar 36. This will prevent the escape of steam between stem 35 and the walls of bearing member 24 while new packing is being inserted in said bearing member. After the new packing has been placed in position bearing member 24 is returned to its normal position to thereby permit the free movement of stem 35 in bearing member 24. Mounted in the casing 39 is a chart 40. Rotative movement is imparted to this chart by a clock mechanism, which is not shown. Rotating charts are common in many arts, and it is not thought necessary to show a clock mechanism for ac-

tuating the same. 41 indicates the casing in which said clock mechanism is mounted. Pivoted at 42 upon a bearing-plate 43, which is carried by the casing 39, is a recording-point 44, carrying a pencil 45, which bears against the face of chart 40. The lower end of recording-point 44 passes loosely through an opening formed in the end of a sleeve 46. Sleeve 46 is slidably disposed upon a lateral stem 47, carried by a reduced portion 48 of stem 35. Nut 29 is provided with an annular flange 49, the lower face of which bears against a shoulder 50, formed by the juncture of stem 35 with its reduced portion 48.

A gage-glass 51, connected at 52 and 53 with casing 5, provides means whereby the height of water in the boiler will be indicated at all times, and a blow-cock 54 provides means for blowing off the water contained in the indicator when desired.

The operation of the device is as follows: The herein-described indicator having been connected to a steam-boiler, water from said boiler enters the interior of casing 5 through the opening 22 and makes its appearance in gage-glass 51, rising to the same level in said glass that it attains in casing 5. The water in the casing causes float 13 to rise, thereby imparting a movement to twisted member 34 through the engagement of said member with slots 23 and 24. This movement, as will be readily understood, will be a partial rotation of said member, and consequently of stem 35, which is integral therewith. This semirotation of stem 35 imparts movement, through lateral stem 47 and sleeve 46, to recording-point 44 to thereby cause pencil 45 to trace a line upon chart 40 for the purpose of maintaining a permanent record upon said chart of the movement of point 44. This will consequently provide a permanent record of the fluctuation of the height of the water contained in the boiler. It will be apparent that it is immaterial whether chart 40 be arranged to rotate once in twenty-four hours or once in seven days, it being only necessary to arrange the subdivision of the chart to correspond with its rate of rotation. By providing a sleeve 46, which is loosely mounted upon a stem 47, a simple and efficient means is provided for compensating for the difference in the direction of movement of point 44 and said stem 47. Stem 47 of course describes a circle from the center of stem 35 and moves in a horizontal plane, while stem 44 describes a circle from its piv-

otal point 42 and moves in a vertical plane. As has been hereinbefore stated, the fact that sleeve 46 has a sliding engagement with stem 47, as well as being capable of rotation with relation thereto, compensates for the difference in the direction of movement of the parts mentioned.

From the foregoing description it will be seen that simple and efficient means are herein provided for accomplishing the objects of the invention; but while the elements shown and described are well adapted to serve the purpose for which they are intended it is to be distinctly understood that our invention is not limited to the precise construction set forth, for changes within the scope of the appended claims may be made without departing from said invention.

Having thus described our invention, what we claim is—

1. In a recording and indicating device of the character described, the combination with a casing, of a stem mounted in said casing, means controlled by the water-level of the boiler for imparting movement of said stem, a bearing member carried by the said casing and a collar carried by said stem, with which said bearing member is adapted to engage.

2. In a recording and indicating device of the character described, the combination with a casing, of a removable guide-frame mounted in said casing, a float, bars carried by said float and engaging a guide-frame, a stem mounted in said casing, a twisted-bar frame, a bar of said stem with which said float engages, a gage-glass, a recording-point, a clock mechanism carrying a rotative dial upon which said recording-point bears and a sliding and oscillatory connection between said stem and said recording-point.

3. In a recording and indicating device, the combination with a casing of a float therein, a rotative stem journaled in said casing, operative connections between said float and said stem, a movable recording element, an arm carried upon said stem and a sleeve loosely surrounding said arm and having positive connection with said element.

In testimony whereof we affix our signatures in presence of two witnesses.

THORNTON S. HARDESTY.
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Witnesses:

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