

(No Model.)

L. HUNT.
ELECTRIC SUNSHINE ANNUNCIATOR.

No. 579,393.

Patented Mar. 23, 1897.

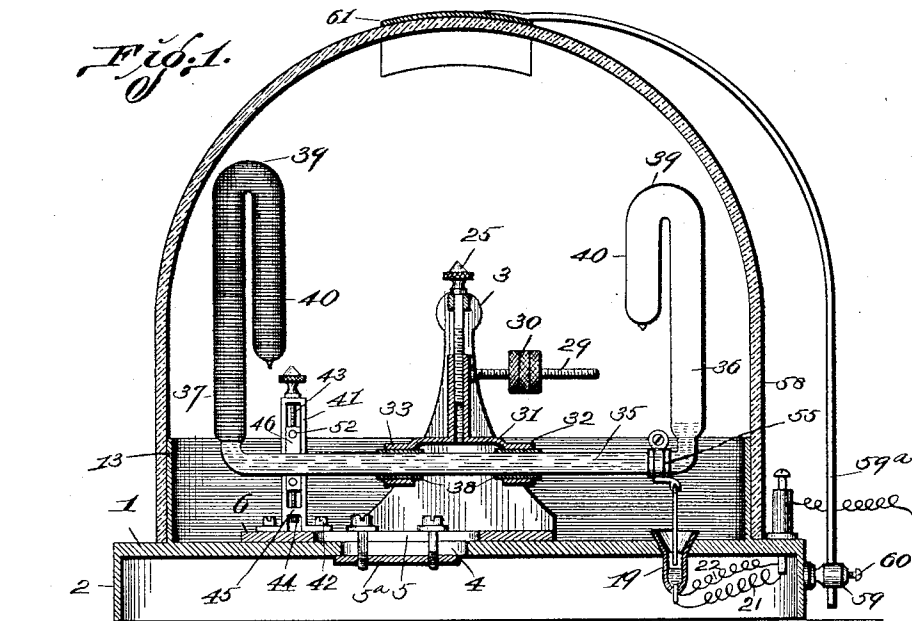


Fig. 2.

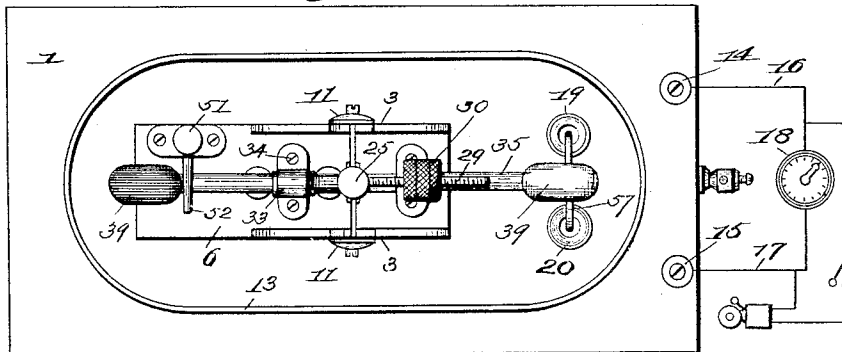


Fig. 3.

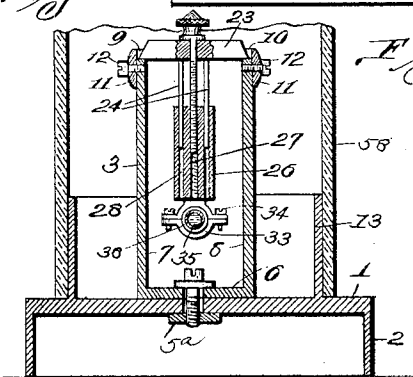


Fig. 4.

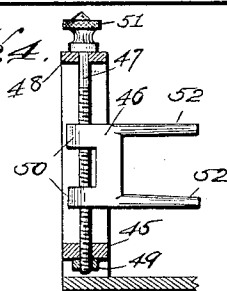
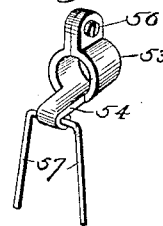


Fig. 5.



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UNITED STATES PATENT OFFICE.

LEONARD HUNT, OF ST. LOUIS, MISSOURI.

ELECTRIC SUNSHINE-ANNUNCIATOR.

SPECIFICATION forming part of Letters Patent No. 579,393, dated March 23, 1897.

Application filed October 17, 1896. Serial No. 609,188. (No model.)

To all whom it may concern:

Be it known that I, LEONARD HUNT, of the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Electric Sunshine-Annunciators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My present invention relates to electric sunshine-annunciators, and is an improvement upon the construction shown, described, and claimed in my application filed March 23, 1896, and serially numbered 584,441, and both of my applications are improvements upon the device shown in United States Letters Patent No. 551,284, granted to myself and Frederick W. Duenckel as joint inventors, of which patent I am now the sole owner.

My invention consists in the novel construction, combination, and arrangement of parts hereinafter shown, described, and claimed.

Figure 1 is a longitudinal sectional view of my improved sunshine-annunciator, taken approximately on the line 1 1 of Fig. 2. Fig. 2 is a top plan view of the device with the glass removed. Fig. 3 is a vertical sectional view on the line 3 3 of Fig. 2. Fig. 4 is a vertical sectional view illustrating the construction of a stop of which I make use. Fig. 5 is a view in perspective of a clip carrying contact-points and used in breaking and closing the circuit.

Referring by numerals to the drawings, 1 is a rectangular metal base, and said base has a rim 2 projecting downwardly from its edges. In the center of the upper face of the base 1 is located a bearing-frame 3, which is adjustably connected to said base by means of the machine-screws 4, working in the slots of the base-block 5.

The bearing-frame 3 consists of the base 6 and the upwardly-extending arms 7 and 8, formed integral, and in the upper ends of the arms 7 and 8 are V-shaped notches forming the bearings 9 and 10.

The disks 11 are secured to the outer faces of the arms 7 and 8 by means of the screws 12 in such a position that said V-shaped notches are hidden from view from either side of the machine.

Projecting upwardly from the upper surface of the base 1 and near the edges thereof

is a wall 13, encircling the mechanism of the annunciator. Fixed to one end of the base 1 and outside of the wall 13 are binding-posts 14 and 15, to which the wires 16 and 17 of the recording instrument 18 are attached. Cups 19 and 20 are located in apertures in the base 1 inside of the wall 13 and near the binding-posts 14 and 15. Wires 21 and 22 are fixed in the bottoms of these cups and connect with the binding-posts 14 and 15. The cups 19 and 20 are partly filled with mercury.

Mounted in the bearings 9 and 10 is a bar 23, having a knife-edge upon each of its ends to form a pivotal connection between said bar and said bearings, and projecting downwardly in parallel positions relative to each other from the center of the bar 23 is a pair of rods 24, and a screw 25 is inserted through the bearing in the center of the bar and extends downwardly between said rods 24 with its head resting upon said bar.

A sliding block 26 has a central aperture 27, which is screw-threaded to receive the screw 25, and upon each side of this central aperture 27 are apertures 28, in which the rods 24 slidably operate. The block 26 is designed to be raised and lowered by the operation of the screw 25, and the screw 25 is operated by manually engaging the milled head thereof. A screw-threaded rod 29 extends from near the upper end of the block 26 and in a horizontal position toward one end of the machine, and a screw-threaded weight 30 is adjustably mounted upon said rod. Attached to the end of and formed integral with the block 26 is a horizontal bar 31, to each end of which are fixed the horizontally-alined loops or clamps 32 and 33. Each of the clamps 32 and 33 consists of two parts in the form of a split bearing, and said parts are held together by means of the machine-screws 34.

A glass pipe 35, having the upturned ends 36 and 37 and filled with mercury, is placed in a horizontal position in the clamps 32 and 33. Strips 38 of packing are placed around the pipe before the clamps 32 and 33 are tightened. The end 36 of the pipe 35 extends upwardly some distance at right angles to the body of said pipe, and then the portion 39 of said pipe is bent inwardly, and a portion 40 of said pipe extends downwardly. The end

36 of the pipe, including the portions 39 and 40, is formed of clear glass. The end 37 corresponds to the end 36 in construction; but said end is painted black.

- 5 A post 41 is attached to the base 6 by means of the screws 42. A slot 43 is formed in the post 41 and extends from near the top to near the bottom of said post and in a direction through said post transversely of the machine.
- 10 A notch 44 is formed from the lower end of the post 41 nearly to the lower end of the slot 43, thus leaving the horizontal wall 45 dividing said slot from said notch. A block 46 is slidably mounted in the slot 43, and a screw
- 15 47 is vertically mounted with its head resting upon the horizontal wall 48, which forms the upper end of the slot 43, and with its lower end extending through a bearing in the horizontal wall 45, and a collar 49 is rigidly fixed
- 20 upon the lower end of said screw 47 to prevent said screw from being drawn out of position. In the arms 50, which extend from the block 46, are formed screw-threaded apertures, through which the screw-threaded
- 25 portion of the screw 47 operates, as required, to raise and lower the block 46 by the manipulation of the milled head 51 of said screw.

Projecting forwardly from the upper and lower ends of the block 46 are arms 52, between which the pipe 35 operates, and said arms act as a stop to limit the vibration of said pipe.

- A clip 53 is placed on the pipe 35 and near the upturned end 36, and from said clip projects a horizontal arm 54. Suitable insulation 55 is inserted between the pipe 35 and the clip 53, and the clip 53 is adjustably held in position by means of the screw 56. When the pipe 35 is made of glass, the insulation
- 35 55 is not required for the purpose of insulation, but takes the place of packing to prevent the clip from crushing the pipe.

An inverted-U-shaped bar 57 is attached to the end of the arm 54, with its ends depending into the cups 19 and 20. A suitable glass case 58 encircles the wall 13 and covers and protects the mechanism hereinbefore described.

- Extending horizontally from the center of the end portion of the rim 2 is a post 59, through which a rod 59^a passes, and said rod is held adjustably in position relative to said post by means of the set-screw 60. The rod 59^a extends upwardly and is bent inwardly to
- 50 a position approximately over the center of the machine, and a sheet-metal shoe 61 is attached to the upper end of said rod and is curved into shape to fit the apex of the glass case, and said case is held in position by the tension of said rod 59^a upon said shoe 61.

By manipulating the screw 25 the center of gravity of the pipe 35 and the ends 36 and 37 of said pipe are raised or lowered relative to the supporting-bar 23, thereby causing the apparatus to be more or less sensitive, as desired. The pipe 35 is adjusted by sliding it through the clamps 32 and 33 until it merely

balances, and then said clamps are tightened, thus holding said pipe in position relative to the clamps. By manipulating the weight 30 upon the screw-threaded rod 29 the ends 36 and 37 can be exactly balanced. The ends 36 and 37 are hermetically sealed, and the horizontal portion of the pipe 35 is filled with mercury until the mercury extends a slight distance into the lower parts of the vertical portions of the ends 36 and 37. Normally the air above the mercury in the white or clear end 36 is under the greatest pressure, and this will cause the mercury to stand slightly higher in the black end 37 than in the white end. The adjusting mechanism should be so manipulated that the white end of the pipe will be overbalanced when the sun is not shining on the mechanism. Then the bar 57 will stand out of contact with the mercury in the cups 19 and 20. The ends 36 and 37 of the pipe 35 perform the same functions as the bulbs shown in the patent above cited and in my concurrent application, and at the same time they are simpler in construction. It is obvious that the shape of these ends is not material, but that it is easier to make them in tubular form than to make them in bulbous form, and that the same result is obtained.

When the sun shines, the black end 37 absorbs more heat than the clear or white end 36 on account of the difference in size and the difference in color, and the air within said black end expands, forcing out the mercury, and thus lightening said black end and causing it to be overbalanced by the white end, and the pipe 35 tips downwardly on the end carrying the clip 53, thus dipping the bar 57 into the mercury in the cups 19 and 20 and closing the circuit between the wires at the lower ends of said cups and causing the registering mechanism to operate. As soon as the sun passes under a cloud the black end cools and becomes heavy again, thus breaking the circuit. By manipulating the screw 51 the stops 52, between which the pipe 35 operates, may be raised and lowered as desired to keep said pipe substantially in a horizontal position as the pipe is raised and lowered by the manipulation of the screw 25. Thus it will be seen that my present invention possesses advantages over my former devices, especially in its simplicity of construction.

The pipe 35 and the upwardly-extending ends may be constructed of glass or metal, and the ends may be bent into any shape and colored in any way that will adapt them to present large surfaces for the differential absorption and radiation of heat, and instead of filling the horizontal portion of the pipe with mercury any liquid may be employed which will retain its fluidity under the conditions to which the instrument is apt to be exposed.

I claim—

1. In an electric sunshine-annunciator, a

supporting-frame adjustably attached to a base, said supporting-frame consisting of the base-plate 6 having the slot 5 through which slot the said plate is adjustably bolted to the base of the machine, the arms 7 and 8 projecting upwardly from opposite edges of said base-plate 6, the V-shaped bearings 9 and 10 formed in the upper ends of said arms and the disks 11 attached to the outer faces of said upper ends by means of the screws 12, substantially as specified.

2. In an electric sunshine-annunciator, the frame 3; consisting of the base-plate 6 having the slot 5 through which slot the said plate is adjustably bolted to the base of the machine, the arms 7 and 8 projecting upwardly from opposite edges of said base-plate 6, the V-shaped bearings 9 and 10 formed in the upper ends of said arms in the disks 11 attached to the outer faces of said upper ends by means of the screws 12; the bar 23 mounted in said bearings 9 and 10, the pair of rods 24 extending downwardly from said bar, the screw 25 inserted through the center of said bar and extending downwardly between the rods 24 with its head resting upon said bar, the sliding block 26 having the central aperture 27 in which said screw 25 operates and having the apertures 28 in which the rods 24 slidably operate, the screw-threaded rod 29 extending from said block in a horizontal position, the screw-threaded weight 30 upon said screw-threaded rod, the horizontal bar 31 formed integral with the lower end of said block 26, and the clamps 32 and 33 carried by the ends of said bar 31, substantially as specified.

3. In an electric sunshine-annunciator, the rectangular metal base 1, the rim 2 projecting downwardly from the edges of said base, the frame 3 adjustably attached to said base by means of the screws 4 operating in the slots 5 and screw-seated in the base-block 5^a; said frame 3 consisting of the base-plate 6, the arms 7 and 8 projecting upwardly from opposite edges of said base-plate 6, the V-shaped bearings 9 and 10 formed in the upper ends of said arms and the disks 11 attached to the outer faces of said upper ends by means of the screws 12; the bar 23 mounted in said bearings 9 and 10, the pair of rods 24 extending downwardly from said bar, the screw 25 inserted through the center of said bar and extending downwardly between the rods 24 with its head resting upon said bar, the sliding block 26 having the central aperture 27 in which said screw 25 operates and having the apertures 28 in which the rods 24 slidably operate, the screw-threaded rod 29 extending from said block in a horizontal position, the screw-threaded weight 30 upon said screw-threaded rod, the horizontal bar 31 formed integral with the lower end of said block 26, the clamps 32 and 33 carried by the ends of said bar 31, the pipe 35 slidably mounted in said clamps 32 and 33 and having the upwardly-extending white end 36 and the up-

wardly-extending black end 37 and the horizontal portion of said pipe being filled with mercury, the clip 53 attached to said pipe, the arm 54 attached to said clip and the U-shaped bar 57 carried by said arm, the cups 19 and 20 mounted in said base-plate 1 and partly filled with mercury and in position to have said mercury engaged by the free ends of said bar 57, and suitable electrical connections with said cups, substantially as specified.

4. In an electric sunshine-annunciator, a pipe having the horizontal central portion 35 filled with mercury, the portion 36 extending upwardly from one end of said horizontal portion, the portion 39 bent inwardly from the upper end of the portion 36 and the portion 40 extending downwardly from said portion 39, said portions 36, 39 and 40 being clear, and having the portion 37 extending upwardly from the end opposite said portion 36, the portion 39 bent inwardly from the upper end of said portion 37 and the portion 40 extending downwardly from said portion 39, said portions 37, 39 and 40 being black, and the lower ends of said portions 40 being sealed, substantially as specified.

5. In an electric sunshine-annunciator, the post 41 attached to a suitable base by means of the machine-screws 42, said post having the slot 43 and the notch 44 and the horizontal walls 45 and 48, the block 46 slidably mounted in the slot 43, the screw 47 vertically mounted in bearings in said horizontal walls 45 and 48 and passing through screw-threaded apertures in the arms 50 which project from the block 46, the collar 49 fixed to the lower end of said screw to prevent said screw from being withdrawn from its position, the milled head 51 upon the upper end of said screw for operating the same, and the arms 52 projecting from said block 46, substantially as specified.

6. In an electric sunshine-annunciator, the rectangular base-plate 1, the rim 2 projecting downwardly from the edges of said base-plate, the frame 3 adjustably mounted upon said base-plate, the horizontal bar 31 pivotally connected to said frame, the clips 32 and 33 carried by the ends of said bar, the pipe, having the horizontal portion 35, slidably mounted in said clips and the clear end 36 extending upwardly from one end of said horizontal portion and the black end 37 extending upwardly from the other end of said horizontal portion, the cups 19 and 20 mounted in said base-plate 1 and partly filled with mercury, suitable electrical connections to said cups, the clip 53 carried by said pipe and the U-shaped bar 57 carried by said clip and in position to engage the mercury within said cups, substantially as specified.

7. In an electric sunshine-annunciator, the rectangular base-plate 1, the rim 2 projecting downwardly from the edges of said base-plate, the frame 3 adjustably mounted upon said base-plate, the horizontal bar 31 pivotally

connected to said frame, the clips 32 and 33 carried by the ends of said bar, the pipe, having the horizontal portion 35, slidingly mounted in said clips and the clear end 36
5 extending upwardly from one end of said horizontal portion and the black end 37 extending upwardly from the other end of said horizontal portion, the cups 19 and 20 mounted in said base-plate 1 and partly filled with
10 mercury, suitable electrical connections to said cups, the clip 53 carried by said pipe and the U-shaped bar 57 carried by said clip and in position to engage the mercury within said cups, the post 41 attached to said frame 3 by
15 means of the screws 42, the block 46 arranged for vertical adjustment in said post, and the arms 52 extending from said block upon opposite sides of said pipe to limit the vibration of said pipe, substantially as specified.
20 8. In an electric sunshine-annunciator, the rectangular base-plate 1, the rim 2 extending downwardly from the edges of said base-plate, the wall 13 extending upwardly from said base-plate, the glass case 58 surrounding said
25 wall and resting upon said base-plate, the post 59 extending horizontally from one end

of said rim, the rod 59^a slidingly mounted in said post and adjustably held in position by means of the set-screw 60, and the sheet-metal shoe 61 attached to the upper end of
30 said rod 59^a and engaging the apex of said glass case to hold said case in position, substantially as specified.

9. In an electric sunshine-annunciator, a pipe pivotally mounted with a substantially
35 horizontal central portion filled with suitable liquid and the ends of said pipe being turned upwardly into planes above said horizontal portion and filled with air and hermetically
40 sealed, and said pipe being cylindrical throughout all its upper parts and said upwardly-turned ends being of a sufficient length to present large surfaces for the differential absorption and radiation of heat, substantially as specified. 45

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

LEONARD HUNT.

Witnesses:

S. G. WELLS,
MAUD GRIFFIN.