Jan. 27, 1925. 1,524,627

C. A. MEURER

DISPLAY DEVICE

Filed May 19, 1923

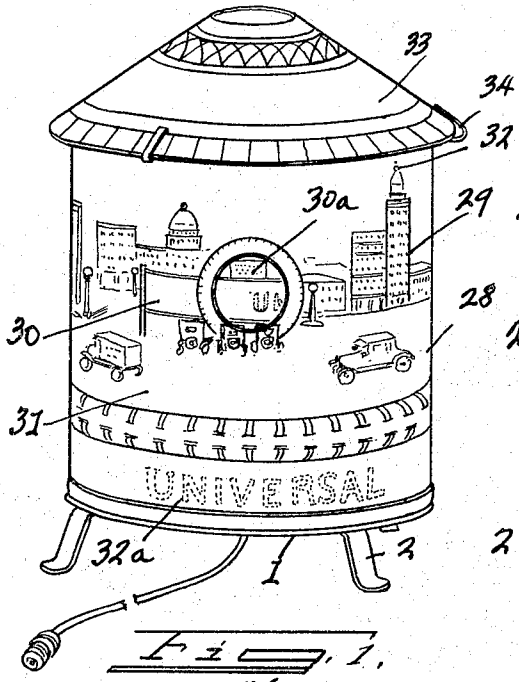


Fig. 1.

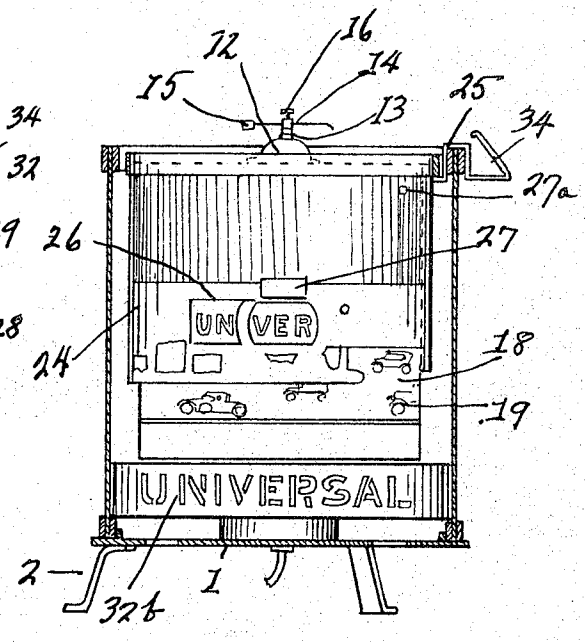
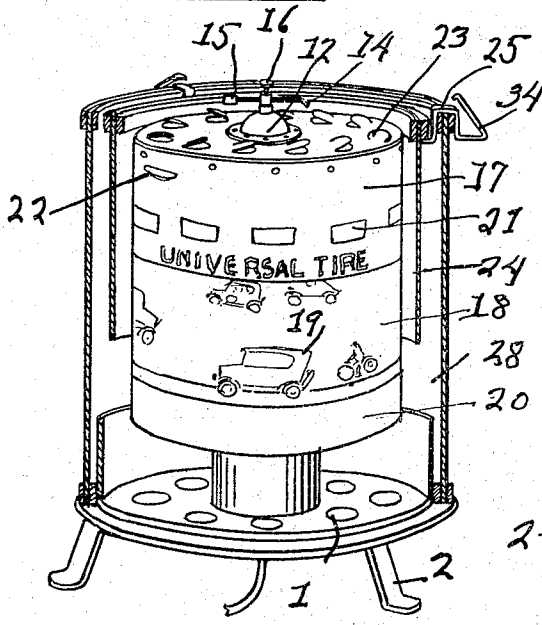


Fig. 2.



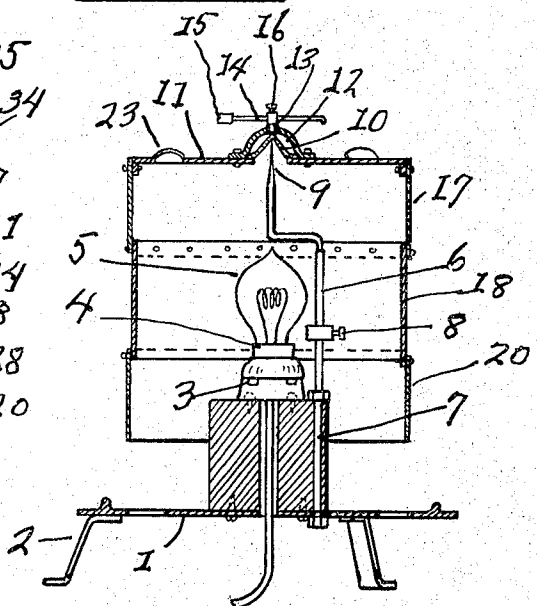


Fig. 4.

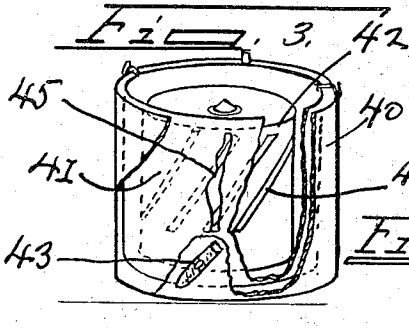


Fig. 5.

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UNITED STATES PATENT OFFICE.

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DISPLAY DEVICE.

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To all whom it may concern:

Be it known that I, CHARLES A. MEURER, a citizen of the United States, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Display Devices, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification.

My invention relates to devices adapted to make pictorial display of the desired character, together preferably with a movable text message, such devices being adapted for use in publicity and propaganda work of various types, and as an amusement device.

My invention further relates to devices, in which a series of drum-like bodies are used, one inside of the other, surrounding a light source and by means of some sort of motive force, certain of said drums are driven, thereby providing for a moving display on the visible or outer drum. As the motive force I prefer to use the heat arising from the source of illumination although, of course, other might be used.

It is the object of my invention to provide for varying transparent areas in a moving pictorial display, using the inner drum as a primary member for providing a moving pattern of areas of light direct or shaded, the next drum or drums as a complementary member to limit the appearance on the outer drum of the patterns formed and moving by the inner, this complementary member serving also as a thrower of areas of light or shadow on the outer drum, and an outer drum formed into a picture or design, and as a transparency to display the combined results of all three or more drums.

In the form illustrated there are but three drums, and of these I call the inner drum, the moving light projecting drum; the second or fixed drum, the light and shadow casting drum or cloud drum, and the outer drum as the design drum.

As will be noted I can obtain an illuminated picture, with areas of partial and bright light, across the light areas of which moving objects pass, and I can provide fixed lights and moving lights and to a large degree can control the direction in which said lights seem to move.

Thus in the example illustrated mainly in the drawing, I show a city street scene, with buildings illuminated with fixed lights. I show traffic signals with lights which flash on and off. I show a sign board across which moves a text message, and at the same time another sign board on which a fixed text message flashes on and off. I show flashing lights on the buildings, and around the moving text sign board, I show a fixed series of border lights. I show a series of moving automobiles, and a fixed text sign which does not flash.

In another example I show a cigar, from which smoke seems to rise in puffs straight upwardly, although the moving lights have a rotary motion.

These are but two examples of a wide variety of effects which it is my object to accomplish. By a series of partial illuminations of a picture on the outside drum, varied by a brightly lighted picture projection from the cloud drum I can provide for changing expression on a face, or the like. I can show the filling of a bottle, the pouring of liquid, fire-works rising and bursting, sky writing, trains moving through tunnels, and across bridges, and many other effects often of startling character. In its essentials all of these effects are gained by using a rotary drum cut out and marked to provide all moving lights, graded lights, and bright lights, this drum to be partially transparent sufficient to give some light to the next drum. The next drum, which I prefer to have fixed, is cut to a pattern which confines the display of the results of action of the first drum on the outer drum, and is also graded as to transparency and opacity. The final drum to the design of which the pattern of the second drum is cut, bears the picture or design for which the other two drums are provided.

It requires, and I provide for adjustability of the inner drums to permit of bringing them to registry with the outer drum. It requires a simple motive power, which I provide by placing fan blades on the inner drum, and it provides for a stabilizing of the inner drum, which I provide by a simple balancing device.

The mode of accomplishment of my above stated objects and advantages will be more specifically pointed out with reference to a selected embodiment of my invention, and

the novelty inherent in the invention will be set forth in the claims that follow.

In the drawings:

Figure 1 is a perspective view of a complete device.

Figure 2 is a side elevation of the device shown in Figure 1, in which the outer drum has been broken away.

Figure 3 is a like view to Figure 1, in which the two outer drums are broken away.

Figure 4 is a view like Figure 3, in which the inner drum only is shown, and is broken away.

Figure 5 is a perspective view partially diagrammatic and broken away to show the three drums, arranged to give the impression of rising smoke.

Referring to the drawings, the device is shown as formed on a base 1, supported on feet 2, and having an internal lamp base 3. On this base is supported a light socket 4, in which is an electric bulb 5. Erected alongside of the bulb, and held in the lamp base is a tube 6, in which slides a rod 7. This rod is adjustably clamped in desired position in the tube by a set screw 8.

The rod turns at a right angle above the lamp bulb and then upwardly over what is approximately the center of the bulb, terminating in a needle point 9.

Referring to the inner or revolving drum, it is provided with a conical shaped glass bearing piece 10, secured to the center of the drum top 11, said bearing resting on the needle point. Also mounted at the center of the top 11, is a housing 12, carrying a transversely bored fitting 13, in which is set a rod 14. This rod 14 has a weight 15 at one end, and its position in the fitting 13, is held in adjustment by means of a set screw 16, that enters the transverse bore from the top.

The drum top has secured thereto, the cylindrical, semi-transparent or translucent ring 17. On the lower edges of the ring 17 is secured another like ring 18, which is in this instance transparent and carries a series of pictures of automobiles, as indicated at 19. At the lower edge of the ring 18 is another ring 20, which is less transparent again.

In the upper ring 17, are stencilled the letters of a moving sign, such as "Universal tire." Also in the upper ring are a series of openings 21, which are to light flashing signs in the cloud drum, and there is also a narrow slot 22, which is to light a flashing light on top of a high building on the outer drum.

In the top of this inner drum, are a series of turned-up tongues 23, which act as a turbine element, through which heated air from the lamp will rise, and cause the drum to revolve.

The cloud drum as shown, is provided with a ring like or cylindrical body 24, having clips 25 of any desired pattern on them, it being the desire that these clips engage snugly over the outer drum, so as to permit of the rotary adjustment of the cloud drum with relation to the outer drum. In the form shown the cloud drum has a cut-away portion at 26, which is arranged to expose the traveling letters of the sign, on a sign board on the outer drum. Just above this cut-out 26, is another cut-out 27, which is provided with a stencil plate. There is also a hole 27^a to give access of light to a flashing traffic semaphore, or danger signal.

The upper portion of the cloud drum, as indicated by shading, is more transparent than the lower portion which is only slightly transparent. The area of higher translucence is arranged to correspond to the scene on the outer drum, in this case of city buildings.

The other cut-outs and the irregular lower edge of the cloud drum, is a matter of arrangement to suit the dark and light areas in the outer drum, it being important where a flashing lighted effect is to be given, that too much general translucence be not present, in the cloud drum.

The outer drum as indicated at 28, is formed with a picture of city buildings, as at 29, superimposed on the drum or cylindrical body 28, and where desired to show lighting in the buildings, small holes are perforated through the drum, thereby permitting the general translucence coming through the two inner drums to shine through. Where the picture is dense, the effect will be of darkness, and where it is not so dense and more light can get through the picture will show the higher lights, the effect being the same as any transparency. Opposite the clear areas where moving pictures and the like formed by the inner drum, are permitted to shine through onto the outer drum, the picture thereon is of the least density, but in back of these areas the cloud drum is most opaque, so that the light that gets through is confined, mainly to a quite definite outline.

Thus in the structure shown there is a clear area forming a sign board 30, which is quite long, and is blank. Above this sign board, is another sign board 30^a, which is blank, and the stencilled letters on the cloud drum are flashed on this sign board. The street 31 is generally a clear area, except where certain pictured objects extend across it, and these objects are kept dark by means of backing them up, so to speak, with semi-opaque portions, left in the cloud drum, when cutting it out.

At the top of the tall building of the picture is a large hole 32, which may be covered on the inside of the drum with a piece of transparent red material.

Below the street picture on the outer drum,

there is shown a painted sign 32[a], through which high light is passed, this being backed up by stencil 32[b] on the inside thereof to give a text message, although the same effect might be accomplished by means of painting the outer drum.

In setting up the device, the outer drum serves as a casing, and a fancy top such as is shown at 33 may be placed on it. I have shown the cloud drum clips, as having tongues 34 turned up to engage and hold this top. The lamp bulb is placed in its socket, the inner drum set on the mounting post and the cloud drum set into and suspended on the outer drum. By turning on the light the operator can bring the cloud drum to registry with the outer drum picture. He then permits the inner drum to rotate and adjusts the set screw on the mounting post until the moving designs come to the correct level for the outer drum. Then permitting the inner drum to rotate under its own power, he watches it for irregularities in rotation and adjusts the counterbalance rod at the top, until this inner drum hangs level, and rotates in a horizontal plane throughout its path.

This sign is then ready for use, and will run as long as the light stays lighted.

Automobiles will appear where the street area is drawn on the outer drum, and will move along. On the main sign board will appear the traveling letters of the moving text message. Both of the sign boards can be surrounded at the edges with small pin holes, which give the effect of a permanent lighting of the sign from the general translucence behind the outer drum. The light at the top of the high building will flash red. The traffic danger semaphore which is placed on the level of the text message will fluctuate in brightness.

The effect gained by use of the cloud drum is to provide a general lighting behind the outer drum to bring out the picture therein, as a transparency, and to leave brighter areas for moving objects. This general lighting could not be accomplished by backing up the outer drum on the inside with thicker and thinner or lighter and darker pieces of paper or the like, without an endless amount of labor, nor would it be possible to block off the showing of the moving designs from a portion of the outer drum, and still permit enough general translucence through to bring out the picture, by means of backing up the outer drum. This is apparent, because, wherever the higher lights, exposed through the inner drum would impinge on the outer picture they would show, or else no light would show through the border of the high lights at all.

I have shown in Figure 5 an outer drum 40, a cloud drum 41, and an inner drum 42. On the outer drum is a picture of a cigar 43, from which a high light area extends (not shown) illustrating smoke rising from the cigar. The cloud drum is cut out as at 45, to match exactly with the high light area for the smoke. The inner drum is cut with a series of slanting slots 46, to give a traveling light effect. As each slot passes the cut-out in the cloud drum it shows through the outer picture at the lower end of the smoke column. It then rises straight up, and before it reaches the top, another slot starts at the bottom of the cut-out, and its image rises as before. This gives the effect of rising and curling smoke from the cigar that is startling in its simulation of reality. By a reversal of the slots in the revolving drum, the light could be made to travel downwardly, this being the device I use in simulating liquid pouring from a bottle.

It is believed that the above description sufficiently points out the various possibilities which I gain by the use of a revolving drum, a cloud drum, and an outer picture drum.

By using photographic negatives, on the outer drum, the artist can gain very real effects, and by providing colors on the inner drum, opposite the cut-away portions of the opaque sections of the cloud drum, distinct varying color showings on the outer drum can be provided.

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

1. A device of the character described, comprising a source of light, and a series of drums surrounding said light, the outer drum having a design thereon having low lights and high lights as in a transparency, a fixed inner drum having cut-away portions corresponding to the high lights, and a third drum inside of the fixed inner drum, and revolved within it, said third drum having cut-away designs adapted to pass across the cut-away portions of the fixed inner drum, during the revolution of said third drum, means for adjusting the position of the fixed drum circumferentially of the outer drum, and means for adjusting the position of the revolving drum axially of the outer drum.

2. A device of the character described, comprising a source of light and a plurality of drums telescoped over it, the inner of said drums being revoluble and having cut-away portions to permit passage of the full radiance of the light, a fixed outer drum having a design thereon adapted to show as a transparency, and a fixed intermediate drum adapted to permit generally a passage of a partial light to show up the transparency, and arranged to block off the showing of the full light radiance through the cut-away portions of the inner drum except for restricted portions of the outer drum,

said cut-away portions in the inner drum being arranged in the form of letters to show a text message on the outer drum.

3. A device of the character described, comprising a source of light and a plurality of drums telescoped over it, the inner of said drums being revoluble and having cut-away portions to permit passage of the full radiance of the light, a fixed outer drum having a design thereon adapted to show as a transparency, and a fixed intermediate drum adapted to permit generally a passage of a partial light to show up the transparency, and arranged to block off the showing of the full light radiance through the cut-away portions of the inner drum except for restricted portions of the outer drum, and the said outer drum having perforations therethrough to permit the full light passing the intermediate drum to show through, at portions of the outer drum which are not registered with the full light exposure portions of said intermediate drum.

4. A device of the character described, comprising a source of light and a plurality of drums telescoped over it, the inner of said drums being revoluble and having cut-away portions to permit passage of the full radiance of the light, a fixed outer drum having a design thereon adapted to show as a transparency, and a fixed intermediate drum adapted to permit generally a passage of a partial light to show up the transparency, and arranged to block off the showing of the full light radiance through the cut-away portions of the inner drum except for restricted portions of the outer drum, said revoluble drum having a portion left exposed by the intermediate drum for full reflection on the outer drum at high light portions thereof, said portion of the revoluble drum having light obstructing elements thereon, to give the effect of a moving design on the outer drum across the high light portions thereof.

CHARLES A. MEURER.