April 20, 1954 E. W. BAGGOTT 2,675,641

BUBBLE EMITTING TOY LOCOMOTIVE

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FIG. 1.

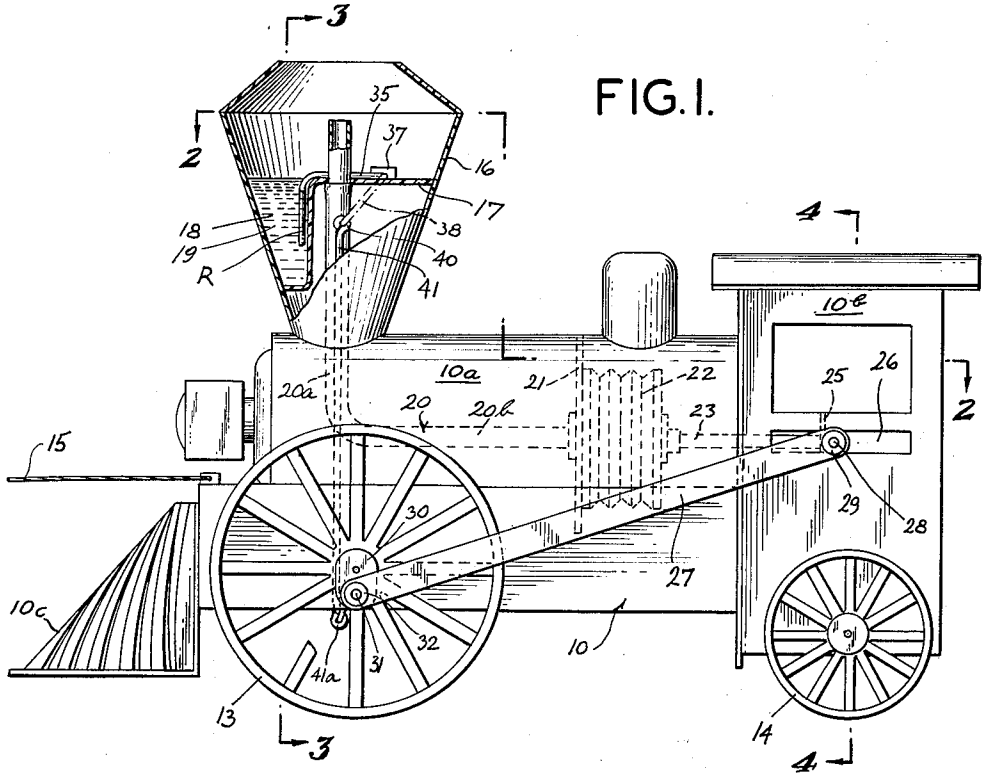
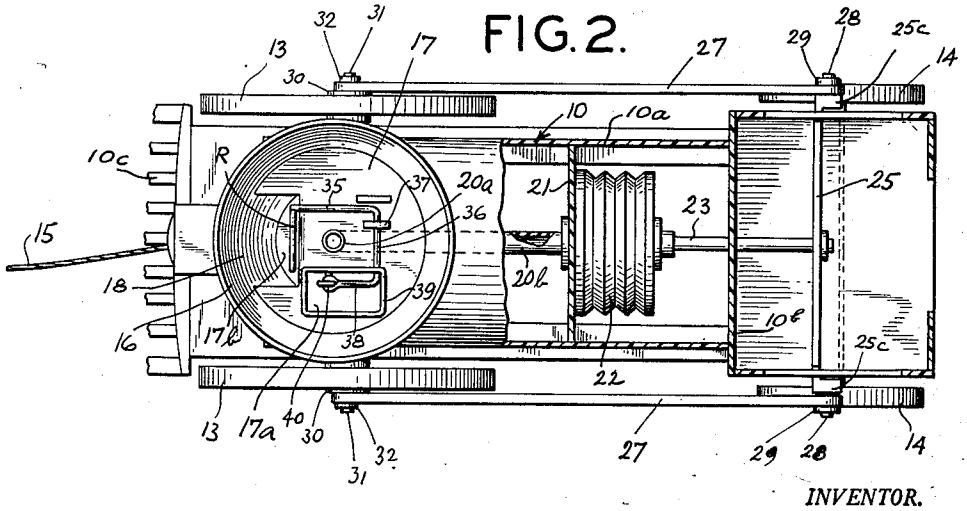


FIG. 2.



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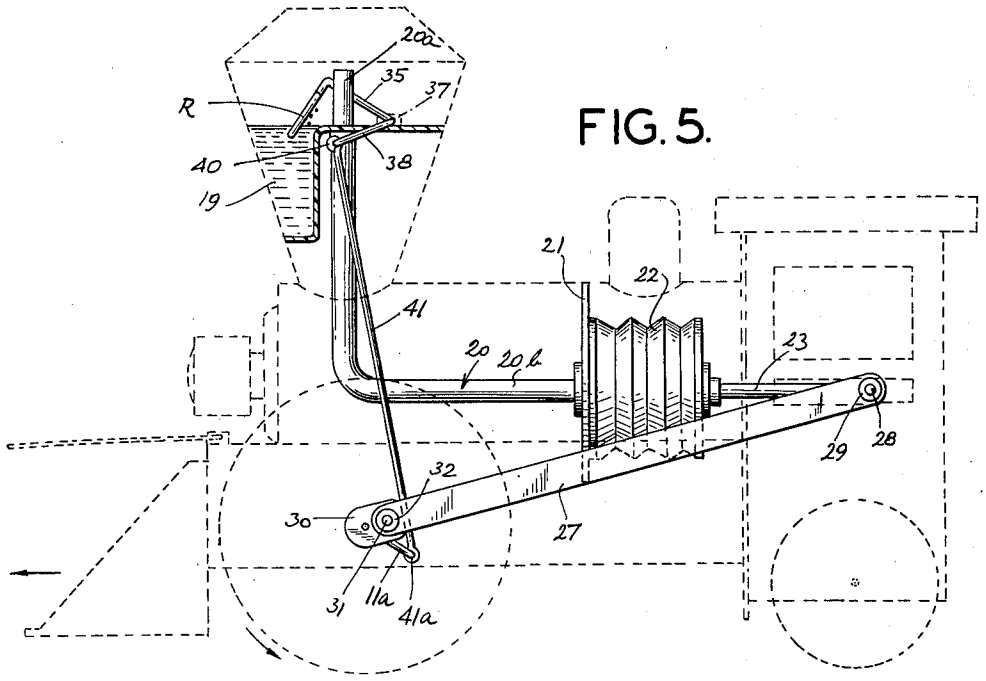

FIG. 5.

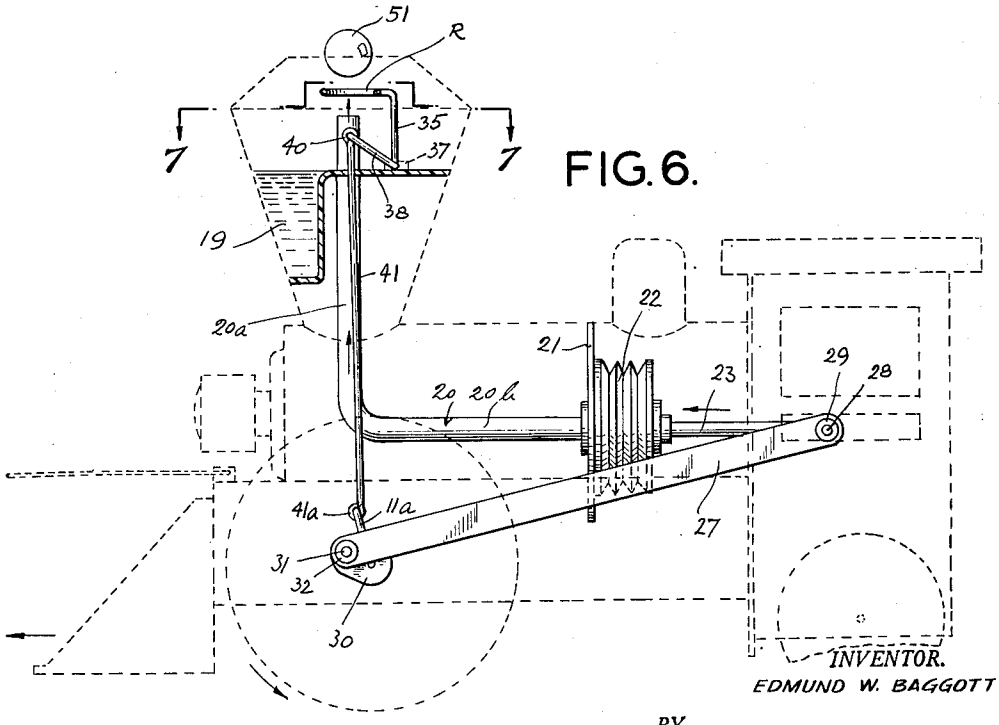

FIG. 6.

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FIG. 3.

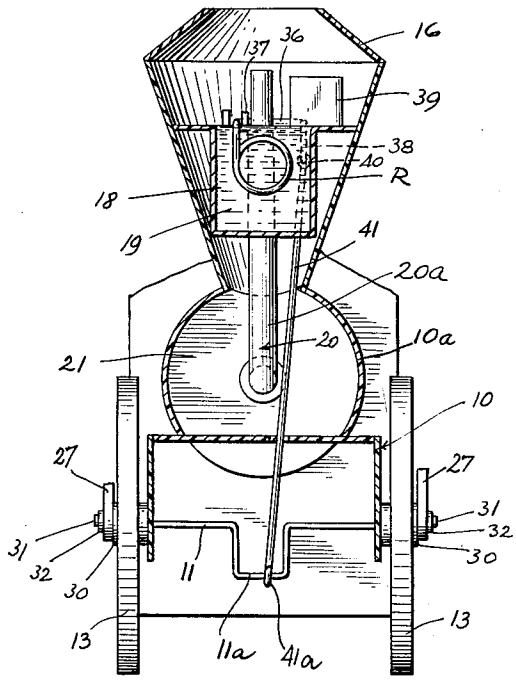


FIG. 4.

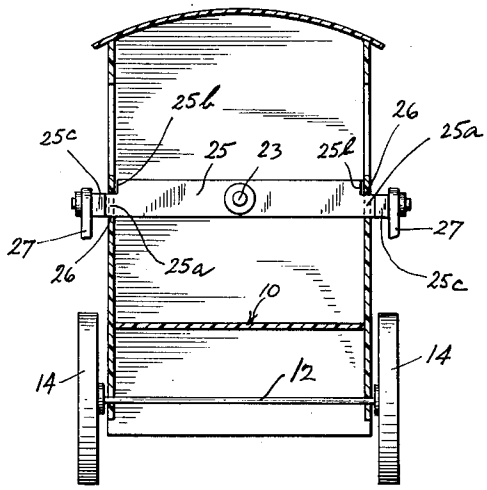
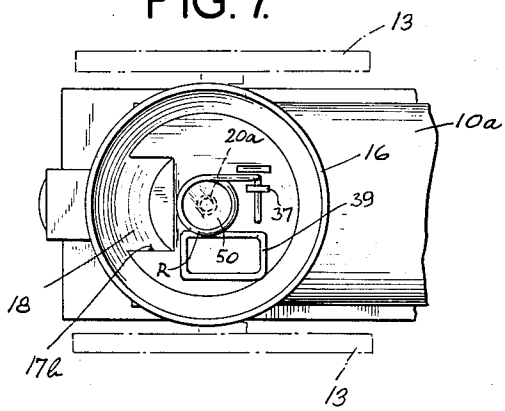


FIG. 7.



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UNITED STATES PATENT OFFICE

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BUBBLE EMITTING TOY LOCOMOTIVE

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Application June 1, 1951, Serial No. 229,398

1 Claim. (Cl. 46—8)

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My invention relates to an improved pull toy which contains a blower device for emitting soap bubbles as a result of the movement of the toy upon a support.

For example, the device may be mounted in a toy simulating a steam locomotive which has a toy smokestack, or a similar toy, said toy having wheels whereby it can be pulled over the surface of a support. The blower device is actuated by the turning of the wheel axles so as to blow a stream of soap bubbles out of the smoke-stack. This produces an effect somewhat analogous to the emission of smoke. The device producing the soap bubbles is economical to construct and easy to operate and may be supplied with a soap solution which is long-lasting and easily replenished. The soap bubbles are more suitable for use in a toy than actual smoke or fine powder.

The blower device comprises an upstanding air tube which is supported in the smoke-stack or funnel of the toy and whose lower end communicates with the interior of a bellows. This bellows is operatively connected to one of the axles of the toy, whereby the bellows is alternately expanded and contracted so as to blow a jet of air out of the top of the tube once during a revolution of said axle.

I mount a well in the funnel, said well being adapted to be filled from the top with a suitable soap solution. A soap-carrying ring is also positioned in the funnel and is operatively connected to said axle. During a revolution of said axle, this ring is successively dipped into the solution, raised above the solution carrying with it a film of soap solution, moved into a horizontal position above the air tube and in axial alinement therewith, and the ring is then returned to its initial position.

The movements of the various parts are synchronized so that the ring is in its horizontal position above the tube when the jet of air is emitted therefrom, whereby to blow a soap bubble out of the funnel during each revolution of the axle. The rate of emission of the soap bubbles may be controlled by varying the speed with which the pull toy moves.

Other objects and advantages of my invention will become apparent from the following description and the annexed drawings, in which preferred embodiments are disclosed.

In the drawings,

Fig. 1 is a side elevation of my improved toy, showing the soap-carrying ring dipped into the soap solution in order to receive a film of soap,

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said toy being shown partly broken away and partly in vertical section;

Fig. 2 is a section on line 2—2 of Fig. 1;

Fig. 3 is a section on line 3—3 of Fig. 1;

Fig. 4 is a section on line 4—4 of Fig. 1;

Fig. 5 is a view similar to Fig. 1, showing certain of the parts schematically in broken lines, the ring being shown just leaving the solution after having received a film of soap;

Fig. 6 is a view similar to Fig. 5, showing the ring in its uppermost position with a bubble being blown therefrom; and

Fig. 7 is a section on line 7—7 of Fig. 6.

My device for blowing soap bubbles is applied to a pull-toy which is shown illustratively in the form of a toy steam locomotive, said toy having a hollow chassis 10. This chassis 10 has front and rear axles 11 and 12 turnably mounted therein, and front and rear pairs of wheels 13 and 14 are respectively mounted on said axles 11 and 12. The toy may be moved along a surface on said wheels 13 and 14, as for example by pulling a cord 15 which is attached to the front of chassis 10.

Said chassis 10 optionally includes a horizontally extending portion 10*a*, simulating a boiler, a rear portion 10*b* simulating a cab and a front portion 10*c* simulating a cow-catcher. All of these chassis portions are illustrated in Fig. 1. As shown in Fig. 1, chassis 10 may include other portions so that it simulates a steam locomotive.

An upstanding hollow element 16 simulating a funnel or smoke-stack is mounted on chassis 10 near the front thereof, the interiors of said stack 16 and chassis 10 being in communication. A preferably horizontal platform or ledge 17 is mounted in stack 16 by any suitable means. The front part of this platform 17 has a substantially rectangular opening 17*b* whose front edge is co-extensive with the wall of stack 16, as clearly shown in Fig. 2 and other views. This opening 17*b* serves as the top of reservoir or well 18, which extends below platform 17. Said well 18 is closed except at the top. It has side and rear walls which extend below the respective side and rear edges of opening 17*b*, and a front wall which is co-extensive with stack 16. All this is clearly shown in Figs. 1–3.

Well 18 is adapted to be filled with a solution 19, which may be a suitable soap solution or other suitable solution commonly used in the blowing of soap bubbles or the like.

Air tube 20 has a vertical section 20*a* which protrudes through platform 17 and is supported thereby, the open end of said section 20*a* being

positioned above platform 17. This section 20a extends below stack 16 into the interior of chassis 10 and is integral with or otherwise connected to the rearwardly extending section 20b of air tube 20. This section 20b protrudes through a vertical transverse wall 21, which is supported by chassis 10 and which in turn supports section 20b.

A longitudinally extending air bellows 22 has one end mounted on and supported by the rear face of wall 21, the interiors of tube 20 and said bellows 22 being in communication with each other. The rear and closed end of bellows 22 has attached thereto a longitudinally extending drive rod 23 which is operatively connected to front axle 11 whereby alternately to expand and contract bellows 22 once during a revolution of said axle 11. As a result, an air jet is forced out of the upper end of section 20a once during a revolution of axle 11.

The rear end of drive rod 23 is fixed by any suitable means to a transverse horizontal bar 25, which is positioned near the rear of chassis 10 and above the positions of axles 11 and 12. The respective end portions 25a of this bar extend through opposed horizontal and longitudinally extending slots 26 in the respective sides of chassis 10. Bar 25 is forwardly and rearwardly slidable in said slots 26 between a position of maximum expansion of bellows 22 and a position of maximum compression of said bellows 22, the respective ends of said slots 26 being positioned beyond the range of movement of bar 25. The main portion of bar 25 is of greater height than the end portions 25a and cannot extend through slots 26. Bar 25 is provided with shoulders 25b at the inner ends of the respective end portions 25a. These shoulders 25b are respectively adjacent the sides of chassis 10, which thereby serve substantially to prevent lateral movement of bar 25.

The ends of bar 25 are respectively provided with ears 25c. Side arms 27 are respectively positioned outside chassis 10, and one end of each said arm 27 is positioned adjacent the outer face of a respective ear 25c and is mounted on a pivot pin 28 which extends transversely from said outer face of said ear 25c. Said arm 27 is turnable about the transverse axis of said pin 28 and is retained thereon by an outer nut 29 or other suitable means.

Each said arm 27 extends forwardly and downwardly and is operatively connected to front axle 11. Each wheel 13 has an outer hub 30 to which the front end of a respective arm 27 is connected in a crank arrangement. Said hub 30 has a transversely extending crank pin 31 mounted on its outer face, said pin 31 being offset from the axis of hub 30 and axle 11. Said arm 27 is turnably mounted on said pin 31 and is secured thereon by outer nut 32 or any other suitable means.

It will be apparent that while axle 11 and wheels 13 complete a revolution, bellows 22 is alternately compressed and expanded, and a jet of air is once blown out of the top of section 20a.

A soap-carrying ring R is operatively disposed in stack 16 and is operatively connected to front axle 11, whereby during a revolution of axle 11, said ring R is successively dipped into solution 19, raised above said solution 19 carrying with it a film of soap solution, moved into a horizontal position above section 20a and in axial alinement therewith, and returned to its initial normal position which is shown in Fig. 1.

Said ring R is substantially annular and is connected in angular relation to an arm 35 which extends for most of its length in a direction parallel to the axis of said ring R. Said arm 35 extends substantially longitudinally and past section 20a. In its starting position of Fig. 1, R is positioned forwardly of section 20a, at which time the rear end of arm 35 is positioned rearwardly of section 20a and below the top thereof and arm 35 is then horizontal. This rear end of said arm 35 is integral with or connected to one end of a transverse bearing arm 36 which is turnably mounted in a suitable bearing member 37 which is fixedly supported on top of platform 17.

The other end of bearing arm 36 is integral with or connected to the rear end of an additional arm 38 which extends longitudinally and which is disposed on the opposite side of section 20a from arm 35. This arm 38 extends downwardly through and is movable within an opening 17a in platform 17. This opening 17a is behind opening 17b and is optionally and preferably enclosed by an upstanding side wall 39 of platform 17 which extends around the edge of said opening 17b. Arm 36 extends turnably through an opening in said upstanding wall 39, which may serve as additional bearing means for said arm 36. The arms 35, 36 and 38 comprise an angular stem for ring R, which is in angular relation to said stem.

The front end of arm 38 is connected by any suitable pivotal connection means 40 to an arm 41 which extends approximately vertically and which is movable up and down through opening 17b. The lower end of said arm 41 is connected to axle 11. It will be noted that said axle 11 has a central substantially U-shaped crank bend, whose cross-arm 11a is substantially parallel to the main axis of said axle 11. The lower end of arm 41 is bent to form an ear 41a through which said axle portion 11a extends.

It will be apparent that the turning of axle 11 causes the movement up and down of arm 41 and hence the turning of ring R about the axis of bearing arm 36. Said ring R is brought into a position in which its axis is in alinement with the axis of tube 20a once during each revolution of axle 11 and wheel 13.

The operation of the device will be described with particular reference to Figs. 1–4 as representing the start of a cycle of operations, and Figs. 5 and 6–7 as representing successive stages in the cycle of operations. It will be understood that the device operates continuously during longitudinal movement thereof, and that therefore the starting point of the cycle is selected arbitrarily and for the sake of convenience of description.

At the start of the cycle, as shown in Figs. 1–4, ring R is vertical and it is entirely immersed in the liquid 19 in well 18, said well 18 being shown as completely filled. Ring R is proximate to the rear wall of well 18 and arm 35 rests upon horizontal platform 17. Arm 41 and axle portion 11a are in approximately their lowermost position, and arm 38 is inclined downwardly from rear to front. Bellows 22 is approximately halfway between its fully compressed and fully expanded positions.

It being assumed that the toy is manually propelled forward in the direction of the respective horizontal arrows of Figs. 5 and 6, it will be noted that wheels 13 turn in a counterclockwise direction.

In the view of Fig. 5, axle or crank portion 11a

has turned in a counterclockwise direction from its initial position slightly less than a quarter of a revolution, thereby raising arm 41 and turning bearing arm 36 about its axis, so as to move ring R almost entirely out of the liquid 15. Said ring R thereby carries with it a soap film 50, which is shown in Fig. 7. Each hub 30 has turned so as to drive its arm 27 and hence move arm 25 to its rearmost position, in which bellows 23 is fully expanded.

As the cycle continues, each hub 30 drives its arm 27 so as to move arm 25 forwardly, thereby compressing bellows 22 in the horizontal direction of the arrow of Fig. 6. This forces a jet or stream of air to flow out of the open end of section 20*a* in the direction of the vertical arrows of Fig. 6. In the meantime, arm 41 is moved upwardly in the direction of the vertical arrows of Fig. 6, thereby moving ring R to a position in which it is above and slightly spaced from and in axial alinement with section 20*a*. This position of said ring R is shown in Fig. 6, in which bellows 22 is shown as having not quite reached its position of maximum compression. Fig. 6 shows the soap bubble 51 which may arise from soap film 50 as the result of the flow of air through section 20*a*.

It will be noted that there is a considerable dwell interval of the cycle, during which at least some portion of the soap film 50 carried by ring R is above the opening in section 20*a* and during which air is being forced by the compression of bellows 22 through said opening in section 20*a* and against said film 50, until the position of Fig. 6 is reached. Furthermore, while the cycle continues from the point of Fig. 6 back to the starting point, air continues to be forced out of section 20*a* until bellows 22 is fully compressed and while ring R is moving out of registration with section 20*a*. This ensures that a relatively sustained flow of air is directed against film 50 during each cycle of operation. This makes it certain that a bubble 51 will be emitted during each cycle.

When chassis 10 is in the shape of a toy steam locomotive, the toy is extremely realistic in its manner of operation. Bellows 22 and its associated parts are substantially hidden from view in the boiler simulating chassis portion 10*a*. Ring R, well 18 and their associated parts are substantially hidden from view. The visible moving parts are primarily the wheels 13 and 14 and the arms 27 which simulate the drive arms of a steam locomotive. The soap bubbles 51 escaping from stack 16 in rapid succession serve as an attractive substitute for real steam.

Various changes, omissions and additions may be made in the invention without departing from the scope and spirit thereof.

I claim:

A bubble-blowing toy in the form of a simulated steam-type locomotive, which comprises a hollow, horizontally extending chassis in the form of a simulated boiler, which is supported on wheels which are fixed to a turnable, lateral axle, a hollow upstanding stack fixed to the top of said chassis with the interior spaces of said stack and said chassis communicating with each other, said stack being vertically alined with said axle, a horizontal platform fixed within the interior space of said stack below the top thereof, a well mounted in said stack in front of said platform and having a top opening on the same level as said platform, an upstanding air tube mounted in said stack and extending above and below said platform through an opening therein and having an outlet opening at its upper end, means including bellows means for forcing a jet of air through said tube and out of said outlet opening, a stem, means mounting one end of said stem upon said platform rearwardly of said air tube so that said stem is turnable about a lateral axis, said stem being laterally offset from said air tube, a film-forming ring, means mounting said ring on the other end of said stem in transverse relation thereof, said stem having a starting position in which it rests upon said platform and extends forwardly from its mounted end to a point in front of said platform, said ring then extending downwardly from said stem into said well, said stem being turnable from said starting position to an end position in which it extends vertically upwardly from said platform to a point above said air tube, said ring then extending forwardly from said stem and over said air tube and being in registration with said outlet opening, said axle having stem-actuating crank-means and bellows-actuating crank-means, stem-connecting means extending upwardly from said stem-actuating crank-means into said stack, and connecting said stem-actuating crank-means to said stem, bellows-connecting means connecting said bellows-actuating crank-means to said bellows means, said bellows means being actuated and said ring being in its end position simultaneously once during a revolution of said axle.

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