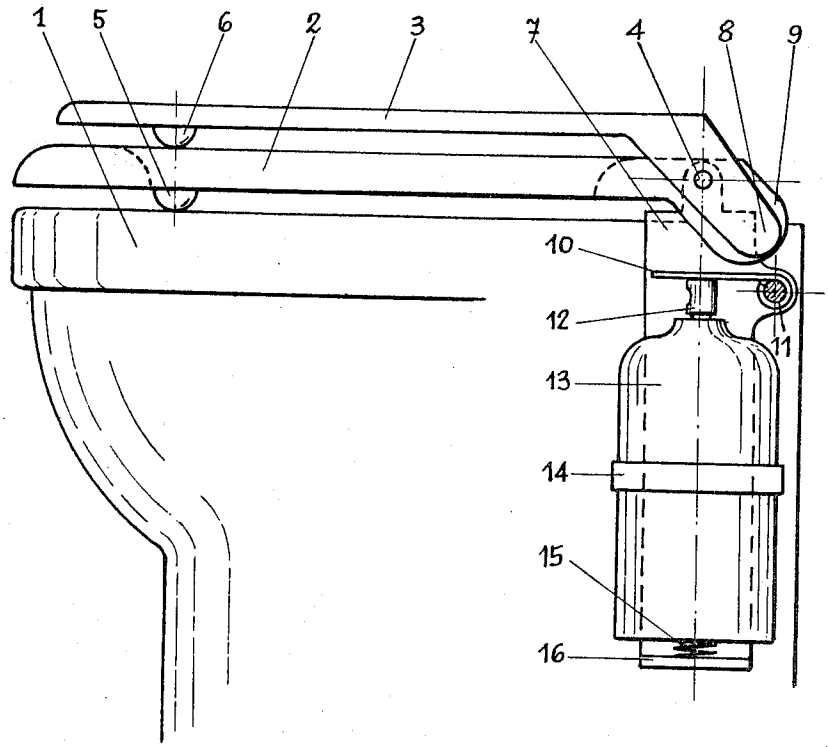
March 5, 1968 E. L. WIPF 3,371,355

HINGED AEROSOL ACTUATOR ELEMENTS FOR SANITARY FLUSH BOWL

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Fig. 1



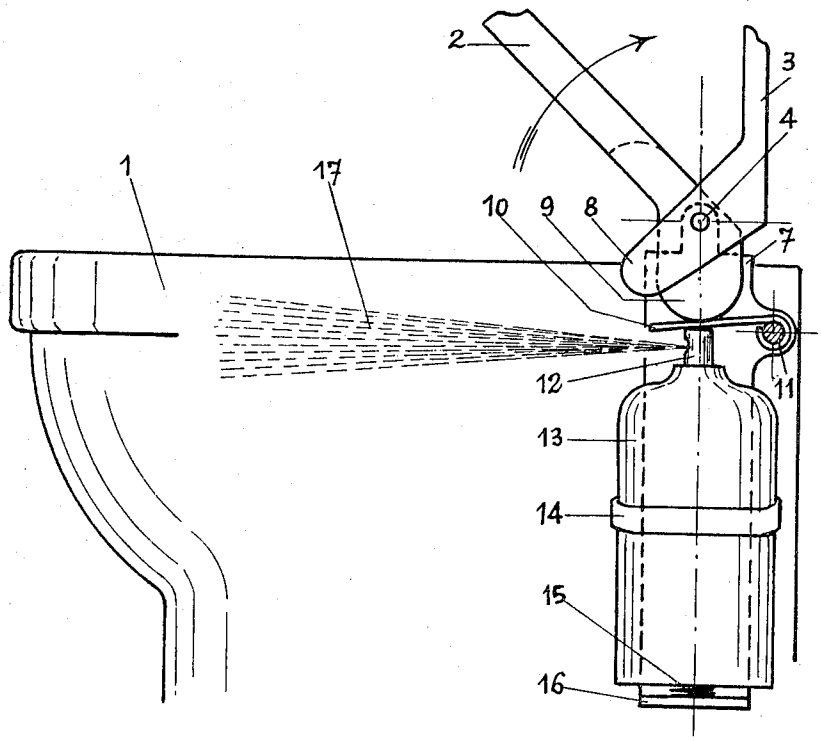
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HINGED AEROSOL ACTUATOR ELEMENTS FOR SANITARY FLUSH BOWL

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Fig. II



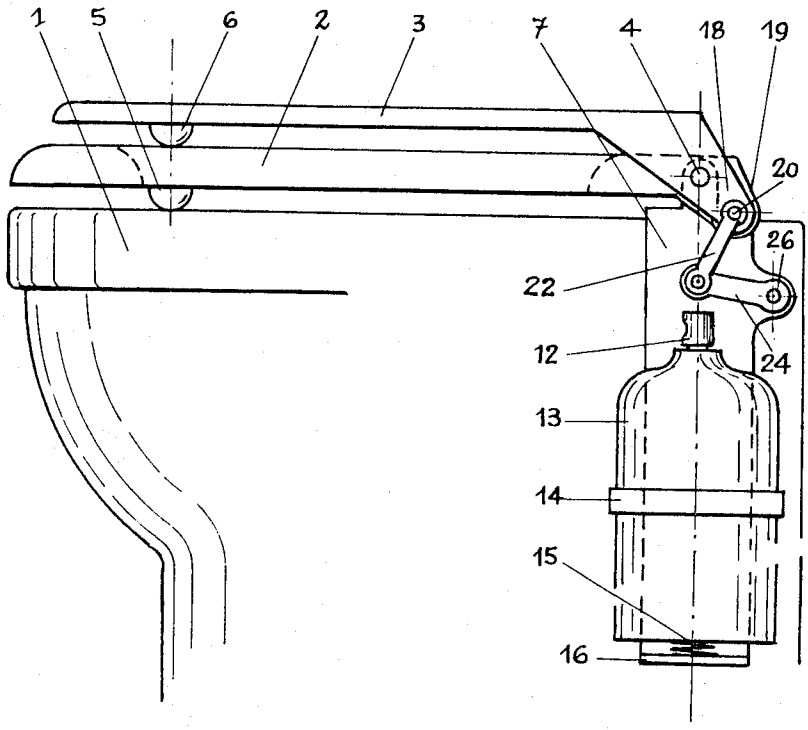
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March 5, 1968 E. L. WIPF 3,371,355

HINGED AEROSOL ACTUATOR ELEMENTS FOR SANITARY FLUSH BOWL

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Fig. III



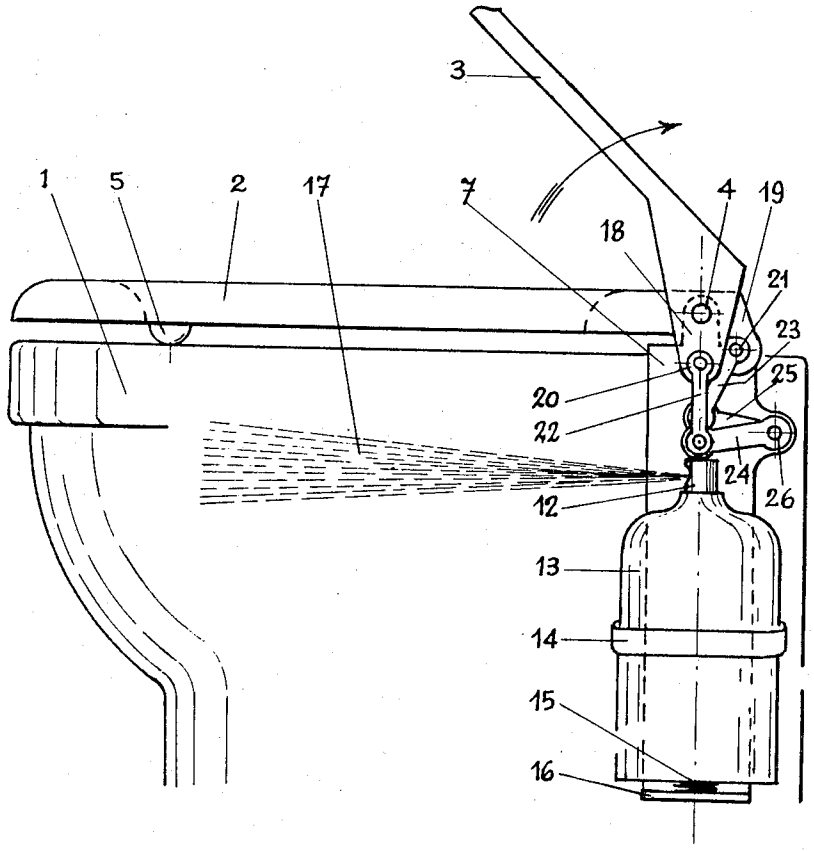
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March 5, 1968 E. L. WIPF 3,371,355

HINGED AEROSOL ACTUATOR ELEMENTS FOR SANITARY FLUSH BOWL

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Fig. IV



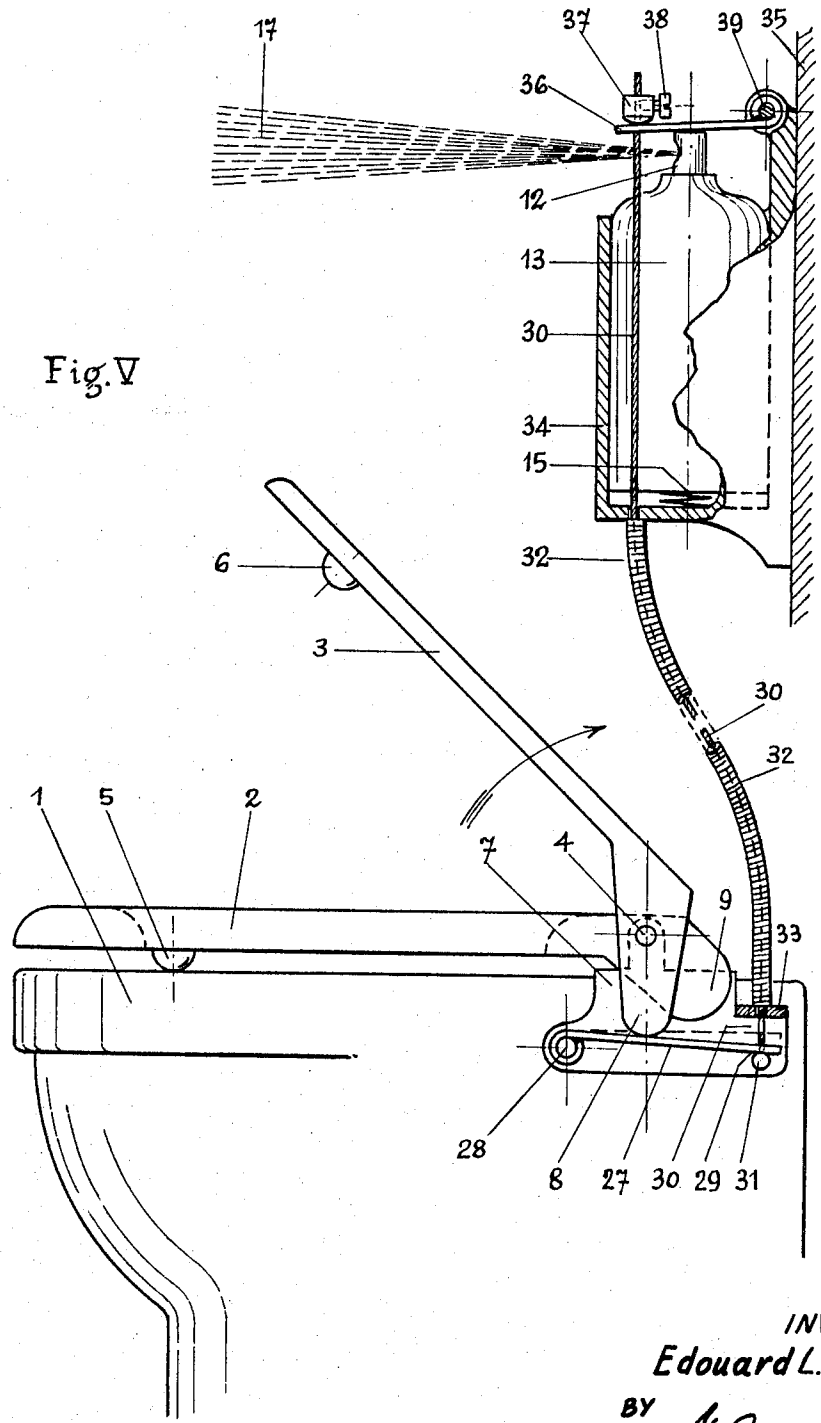
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HINGED AEROSOL ACTUATOR ELEMENTS FOR SANITARY FLUSH BOWL

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Fig. V



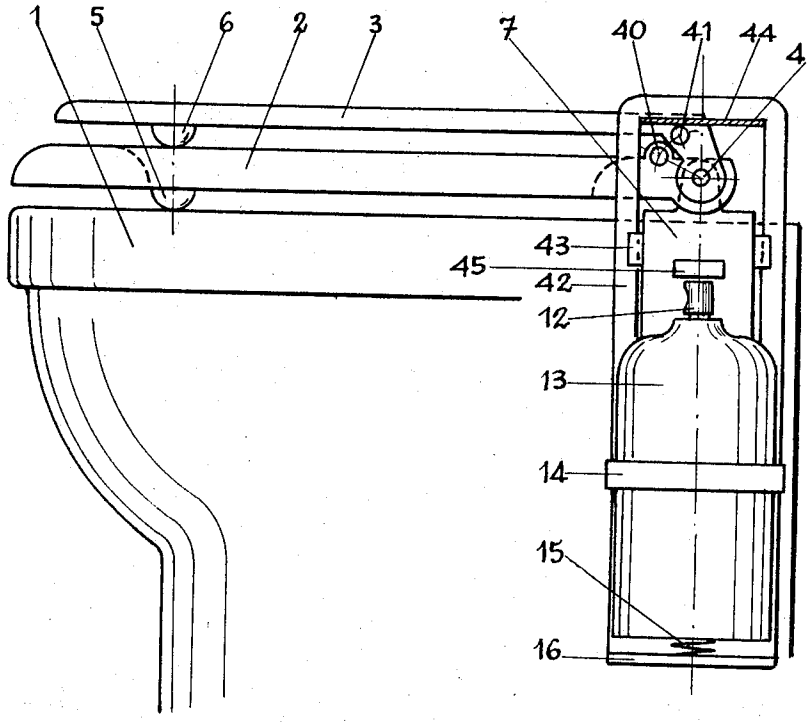
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HINGED AEROSOL ACTUATOR ELEMENTS FOR SANITARY FLUSH BOWL

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Fig. VI



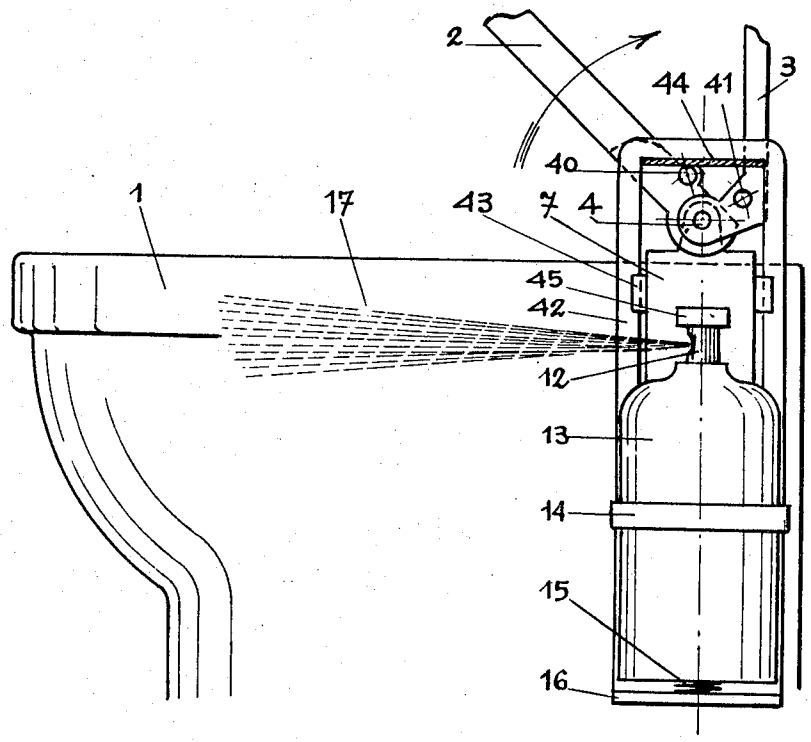
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HINGED AEROSOL ACTUATOR ELEMENTS FOR SANITARY FLUSH BOWL

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Fig. VII



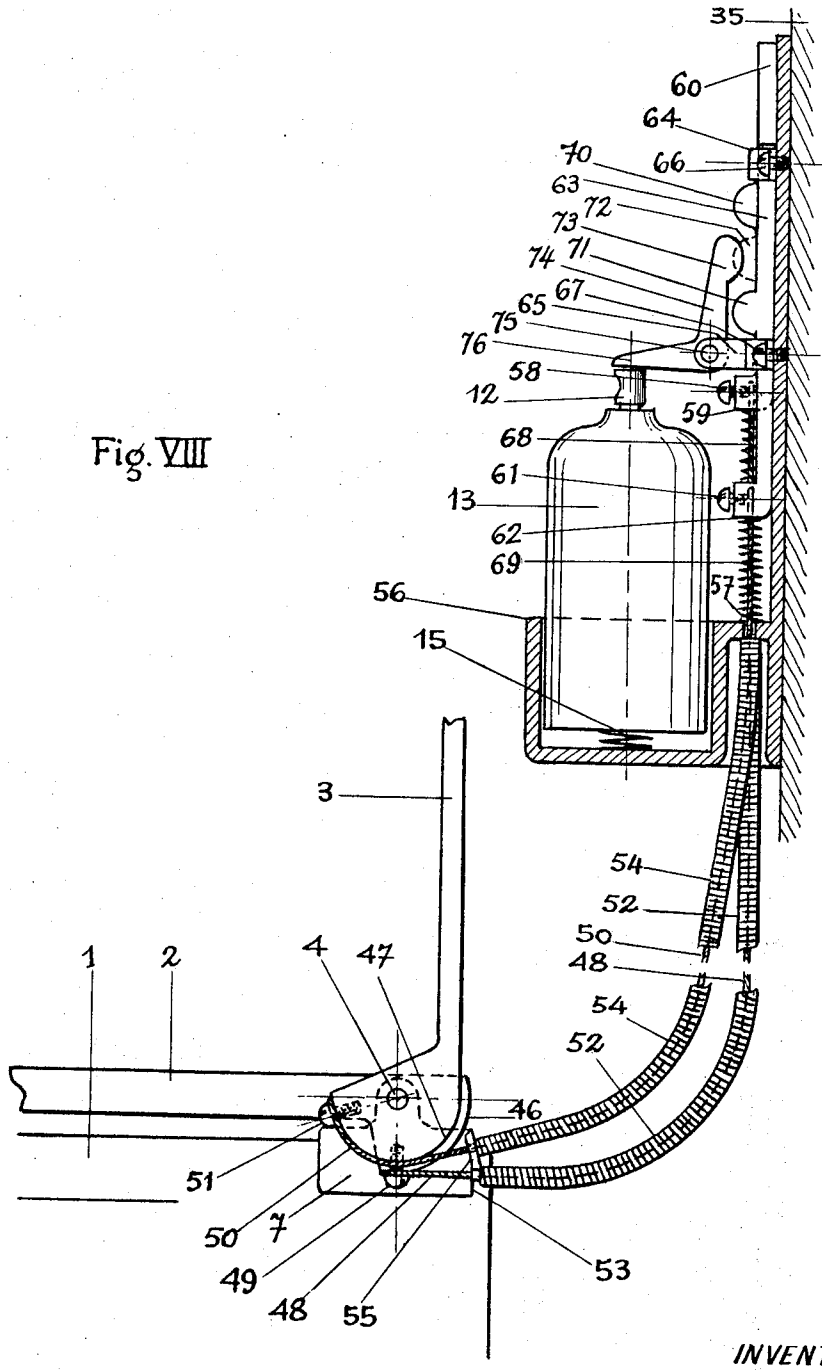
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HINGED AEROSOL ACTUATOR ELEMENTS FOR SANITARY FLUSH BOWL

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Fig. VIII



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Patented Mar. 5, 1968

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HINGED AEROSOL ACTUATOR ELEMENTS FOR SANITARY FLUSH BOWL

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Claims priority, application France, Dec. 12, 1963, 956,976
6 Claims. (Cl. 4—222)

This invention relates to hinged elements (seat and cover) of a sanitary flush-bowl or analogous apparatus which may be envisaged in the frame of the invention. Said hinged elements (a hinged seat and a hinged cover of the bowl) when separately or simultaneously raised or lowered by rotation, act automatically to spray a small quantity of an hygienic or desodorizing aerosol substance.

This result is obtained by a simple device which profits by the quarter-turn rotation movement of said seat or cover, between their horizontally lowered position and their vertically raised position, or vice versa, for procuring a short pressure on the nozzle-plug of a pressurized container, viz. a conventional "aerosol bomb," thus provoking a spray-blasting of a hygienic liquid-mist from said container.

This simple device preferably comprises means as cams, cranks and connecting rods, transforming a rotary motion in a rectilinear to-and-fro motion which may be applied either directly on the nozzle-plug of the container, or indirectly if said container is located in a remote place, not adjacent to the hinged elements. In this last alternative, there is provided an adequate transmission of motion.

The foregoing and other inventive features will be more clearly understood from the following description, to be read in conjunction with the accompanying drawings, of several constructive forms of actuating devices according to the present invention.

In the drawings:

FIG. 1 is a side view of a cam structure, seat and cover being lowered;

FIG. 2 is a similar view, seat and cover being half-raised;

FIG. 3 is a view of another structure, seat and cover being lowered;

FIG. 4 is a similar view, with the cover raised;

FIG. 5 is a view of a still different remote-actuated structure, with the cover raised;

FIG. 6 is a view of a fourth structure where the aerosol container is raised, the seat and the cover being lowered;

FIG. 7 is a similar view, with raised cover and raising seat;

FIG. 8 is a fifth structure with remote double-cabled control transmission.

In all the above figures, there is represented the sanitary bowl **1** with its seat **2** and cover **3**, both of them being hinged on the pivot **4** for their raising or lowering rotation. Rubber blocks **5** and **6** are located between said pieces. The pivot **4** is supported by a piece **7** which on the other hand secures the hinged elements on the bowl.

FIG. 1 shows the cam structure with the seat and the cover lowered, and FIG. 2 shows the same structure with the cover raised while the seat is at half-way of its own raising or lowering rotation, when its passing operates the aerosol bomb.

For that purpose, the cover is laterally provided with a cam **8**, and the seat is provided with a cam **9**, said cams being positioned at 45° between the horizontal and the vertical, as represented on the drawings. The outer radius of the bosses of said cams is the same, and of such a length that each of said cams engages the pawl **10** at half-way of their quarter-turn rotation when their respective hinged element is raised or lowered. Said pawl **10** is journalled on a stationary shaft **11** secured on the support-piece **7** and is supported at its free end by the nozzle-plug **12** of a pressurized bottle or bomb **13** containing the hygienic or desodorizing liquid and secured to the support-piece **7** by a rubber belt **14** encircling them with a relative vertical play given to the bomb the basis of which is supported by a spiral spring **15** engaged between the outer surface of said basis and a lateral projection **16** of the support piece **7**. When one of said cams **8** or **9** passes at the vertical (FIG. 2) due to the rotation of the seat **2** or the cover **3** (either in one or the other direction), it engages the pawl **10** which in turn depresses the nozzle-plug **12** of the bomb **13**, the aerosol of which being thus in part delivered as a fine spray of an hygienic mist **17**.

In view of avoiding a too accurate (and expensive) structure, the stroke of the pawl **10** is substantially greater than the requested lowering of the nozzle-plug **12** of the bomb **13**, the remnant of said stroke being absorbed by the spring **15** which is compressed, thus preventing any damage of the moving parts or of the bomb itself.

As soon as the seat (or the cover) is beyond the middle-point of its rotation, the cam relieves the pawl, and the nozzle-plug comes back to its rest position, and the liquid spray is stopped.

The same working occurs in either one or other direction, as well for the seat **2** than for the cover **3**.

On FIG. 3 is represented a modified structure of the invention, using a crank and connecting rods; on said FIG. 3, the seat **2** and the cover **3** are lowered, while on FIG. 4, the cover is half raised (or half lowered, say in the same position). The cover **3** is provided with a crank-arm **18** having an end crank-pin **20**; the seat is provided with a crank-arm **19** having an end crank-pin **21**. The arms **18** and **19** are positioned at 45° downwards. On the crank-pins **20** and **21** are articulated connecting rods **22** and **23** respectively. On FIG. 3, the connecting rod **23** is hided by the connecting rod **22**, and the crank-pin **21** is hided by the end of the crank-arm **18**, but they are visibles on FIG. 4.

By their respective opposite ends, the connecting rods are respectively articulated on a lever **24** (for the rod **22**), and on a lever **25** (for the rod **23**), both of them rotating on a stationary shaft **26** integral with the support-piece **7**. The free end of each lever thus describes a circular arc facing the nozzle-plug **12** and finally engaging it at the end of its own stroke, when the crank-pin **20** (or **21**) passes at the vertical of the axis **4**. The surplus of the working is the same as according FIGS. 1 and 2, with the same results.

The structure according to FIG. 5 is an example of a remote control, using a cam device similar to FIGS. 1 and 2, though it could use the crank and rod structure according to FIGS. 3 and 4.

On FIG. 5, the cover is represented at half-way of its lowering or raising rotation, while the seat is lowered. Similarly as on FIG. 2, the cams, at half-way, are engaging a pawl **27** journalled on a shaft **28** secured to the support-piece **7**.

The end of a cable **30** is passing through the free end **29** of the pawl **27** and is provided with an end stop-ball **31** so as to transmit the motion from point **29** to point **30**. Said cable is sliding in a flexible tubular Bowden cover **32**, the lower end of which is butting against a lateral projection of the support-piece **7** the cable is passing through a hole. Cable and cover have a substantial length and they are connecting to the main device a box **34** secured to the wall **35** and receiving the bottle or bomb **13**. The flexibility of said cable and cover assembly gives a relative freedom in the choice of the location of the bomb and consequently of the site and direction of the aerosol spray.

The upper end of the tubular cover **32** is engaging

the lower portion of the box 34 around a hole the cable 30 is passing through to pull a blade 36 by a ring 37 fixed on the cable 30 by a screw 38.

The stationary end of the blade 36 is journalled on the stationary shaft 39 integral with the box 34, and the free end of said pawl is normally supported by the nozzle-plug 12 but does not push it when the cable is not urging said pawl. When (see FIG. 5), a cam is depressing the pawl 27, the cable 30 transmits its motion to the blade 36 which depresses the nozzle-plug, delivering the spray 17 of the hygienic aerosol. The spring 15 acts following the same manner than according the other figures.

It is obvious that without departing from the spirit of the invention, the transmission of motion could be obtained by a direct cable (without cover), or by a connecting push or pull rod.

In the example represented on FIGS. 6 and 7, the seat 2 has a lateral pin 40 and the cover has a lateral pin 41. Said two pins are located on the same radius from the axis 4 and positioned following to adjacent 45° angles not to hinder each other (see FIG. 6). The bottle or bomb 13 is supported on a frame 42 sliding vertically and freely between two guide-parts 43 of the support-piece 7; the superior part 44 of the frame 42 is flanged over the pins 40 and 41 so as to cut, by an horizontal secant, the circular arc described by said pins. During the upward rotation of the cover 3 or of the seat 2 (FIG. 7), the pins 40 or 41 first raise the frame 42 by engaging its flange 44, then at the end of their movement, they let it fall back to its initial position.

The bottle or bomb 13 being made integral with the frame 12 through the spring 15, is in turn raised slightly but enough to have its nozzle-plug 12 engaged on the stationary projection 45 of the support-piece 7 which depresses it in the bottle-neck and delivers a spray of hygienic aerosol. The same process occurs during the return movements to the lowered position of the hinged elements.

On FIG. 8 is represented an alternative structure where the bottle or bomb is still remote from the seat, but where the indirect transmission is provided between the hinged elements and the bomb-control through two flexible cables, one for the seat and one for the cover.

On said FIG. 8, the cover is represented raised while the seat is lowered. The sea comprises a lateral circular sector 46, and the cover has an equivalent circular sector 47. In fact, both of said sectors have the same radius but they appear different on the drawings to procure an easier understanding.

A flexible cable 48 is winding around the sector 46 during the rotation of the latter; said cable is fixed on the fore-end of said sector by a screw 49. Similarly a flexible cable 50 is winding around the sector 47 on the fore-end of which it is fixed by a screw 51. The cable 48 is inserted into a supple tubular cover 52 supported by an upwardly flanged part of the support-piece 7 having a hole through which passes the only cable 48. The cable 50 is inserted into a second tubular cover 54 supported by an upwardly flanged part 55 of the support-piece 7 having a hole through which passes the only cable 50.

The two above flexible cables, in combination with their tubular covers, are connecting the hinged elements (seat and cover) to the other unit of the device thus allowing said unit to be secured to the wall 35 (or elsewhere, on request).

The upper parts of the tubular covers 52 and 54 butt against the wall of the box or housing 56 secured to the wall 35, the cables passing through a hole provided in said wall. Beyond said wall, the top end of the cable 48 is secured by a screw 58 in the head 59 of a guide-piece 60. The cable 50 is similarly secured by a screw 61 in the head 62 of a guide-piece 63.

Both of said guide-pieces may vertically slide between the wall of the box 56 and two petty bridges 64 and 65 secured by screws 66 and 67. They are brought back upwards by corresponding spiral springs: 63 encircling the cable 48, and 69 encircling the cable 50. Said springs have their lower end butting against the wall of the box 56, and their upper end engaging the heads 59 and 62 respectively.

The guide-piece 60 has a boss 70 and the guide-piece 63 has a boss 71, said bosses vertically moving downwards when the corresponding hinged elements (seat or cover) are raised, and vertically moving upwards when said elements are lowered, during their rotation.

At half-way of their stroke, the bosses 70 and 71 are passing against the end 73 of a bell-crank lever 74 pivoted in 75 on the petty bridge 65; when said end 73 is pushed to the left by the passage of a boss, the bell-crank-lever 74 has its other arm 76 lowered which in turn depresses the nozzle-plug of the bottle thus delivering a spray of aerosol.

The spring 15 acts as according the above mentioned and specified structures.

When one of the bosses 70 or 71 has moved beyond the position 72, or in other words when either the seat or the cover is completely raised, the bell-crank-lever 74 is relieved and relieves in turn the nozzle-plug 12, thus stopping the spray of aerosol. The same process occurs when one of the hinged elements (seat or cover), or both simultaneously, are lowered.

Each of the two hinged elements, when passing at half-way of its rotation, provokes two aerosol sprays: one when going, one when turning back.

What I claim is:

1. In a sanitary installation including a flush-bowl, a seat and a cover over said seat, means hingedly connecting said seat and cover to said flush-bowl for pivotal movement about a common axis from closed position where said seat and cover lie over said flush-bowl to open position where they stand generally upright, the improvement in the combination comprising:

(a) a pressurized container having a nozzle-plug normally biased to inoperative position, said nozzle-plug depressible along the axis of said container to operative position thereof;

(b) a cam member on each of said seat and cover adjacent said hinged ends and offset from said common axis to be displaced about said axis when either of said seat and cover is pivoted, and

(c) means operable by either of said cams to actuate said nozzle-plug of the container in a rectilinear motion causing operation thereof only when either of said seat and cover stands about mid-way between said closed and open position and vice versa.

2. A combination as claimed in claim 1, wherein said cams are projections of said seat and cover extending angularly rearwardly thereof at an angle of approximately 45° when said seat and cover are in closed position; a support is provided in said flush-bowl beneath said hinge means; said container sits on said support and resilient means is provided between said container and support to bias said container upwardly and said means operable by said cams is a pivotable pawl resting on the nozzle-plug of said container, so constructed and arranged that said pawl is located in the path of said projections and is depressed thereby to, in turn, depress said nozzle-plug to operative position upon said projections reaching about said mid-way position.

3. A combination as claimed in claim 1, wherein said cams are projections of said seat and cover extending angularly rearwardly therefrom and at an angle of approrximately 45° when said seat and cover are in closed position; a support is provided in said flush-bowl and on which said container sits; said means operable by said cams comprises:

a connecting rod and a lever for each projection;

said rods and levers pivotally interconnected at one end;

each rod pivotally joined at the free end thereof to the lower end of one of said projections and each lever pivotally joined at the free end thereof to said support laterally and rearwardly of said nozzle-plug so constructed and arranged that said interconnected ends of said rods and levers depress said nozzle-plug to operative position upon said projections reaching said midway position.

4. A combination as claimed in claim 1, wherein said cams are projections of said seat and cover extending angularly rearwardly thereof at an angle of approximately 45° when said seat and cover are in closed position; a support for said container above said seat and cover and on which said container sits; said means operable by either of said cams comprising:

a generally horizontal blade pivotally mounted in said flush-bowl and located so as to be pivoted downwardly by said projections when the latter reach the said midway position;

a generally horizontal pawl pivoted at one end to said container support so that the free portion of said pawl lies over said nozzle-plug of said container;

Bowden cable means including a flexible cable connected at one end to the free end of said pawl and, at the other end, to the free end of said blade, constructed and arranged so that depression of said blade by movement of said cam projections thereon, when the latter reach said midway position, depresses said pawl and nozzle-plug through the action of said Bowden cable means.

5. A combination as claimed in claim 1, wherein said cams are a pair of pins projecting laterally from said seat and cover at equal distances from said common hinge axis in the direction opposite from said flush-bowl; a support is provided in said flush-bowl on which said container is received; said means operable by said cams comprising:

stationary guide means fixed to said bowl for guiding said support and container into a vertical movement from a raised spraying position to a lowered inoperative position;

a stirrup member fixed to said support and having a transverse horizontal part located above said pins and in the path of movement of said pins as said seat and cover move from said open to closed positions and vice versa;

a stationary horizontal actuating member on said guide

means above said nozzle-plug through the vertical axis thereof and positioned across the path of said plug as the support and container move from said lowered to said raised position, so constructed and arranged that said actuating member depresses said nozzle-plug when said stirrup member is lifted by said pins acting on said stirrup transverse part when said seat and cover reach said midway position.

6. A combination as claimed in claim 1, wherein said cams are circular sectors coaxial with said common axis and at the ends of said seat and cover adjacent said common axis; a support is provided above said flush-bowl on which said container is received; wherein said means operable by said cams comprises:

a bell-crank lever pivoted at the apex thereof and having a generally horizontal arm normally resting on said container nozzle-plug and a vertical arm formed, at the upper end thereof, with an outward bulge;

for each of said seat and cover, an actuating member therefor to pivot said bell-crank lever, said lever vertically slidable and formed with a boss projecting in the direction of said bulge of said bell-crank lever vertical arm; said members displaceable between a low and a high position corresponding to the open and closed positions of said seat and cover with said bosses pushing on said bulge to pivot said bell-crank lever and to depress said nozzle-plug as said seat and cover reach said midway position;

Bowden cable means including a pair of flexible cables connected at one end to the forward ends of said circular sectors and, at the other end, to the lower ends of said actuating members, respectively; said cables to wind around said sectors as said seat and cover move from closed to open position; and

resilient means biassing said actuating members upwardly to said high position.

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