

July 22, 1952

J. L. HOBBY

2,604,069

WEANING BIT

Filed Sept. 27, 1950

2 SHEETS—SHEET 1

Fig. 1.

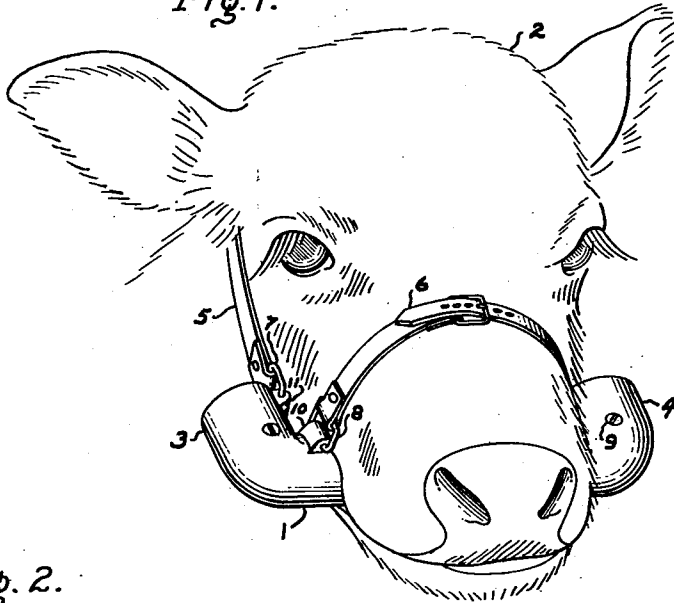


Fig. 2.

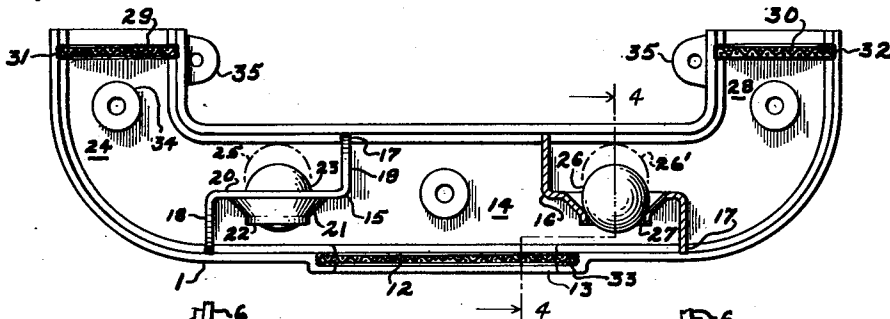


Fig. 3.

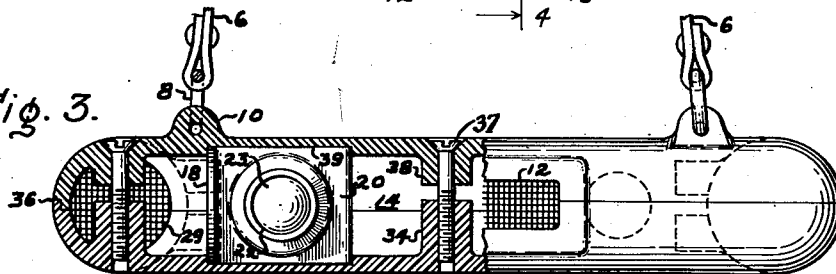


Fig. 4.

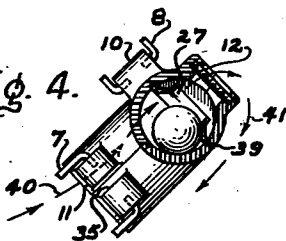
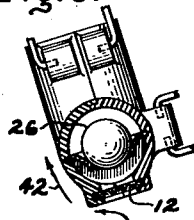


Fig. 5.



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2 SHEETS—SHEET 2

Fig. 6.

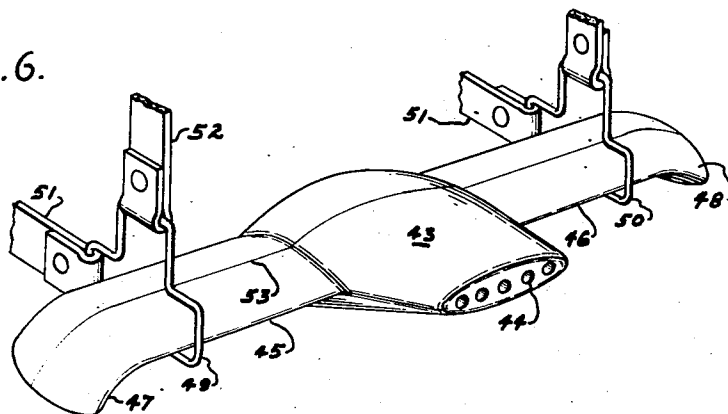


Fig. 7.

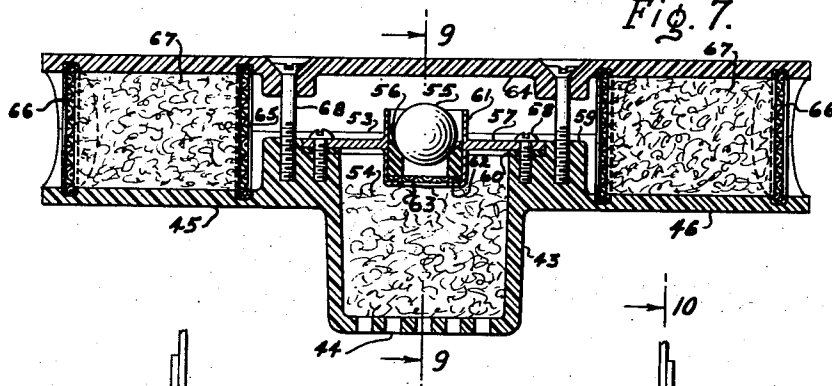


Fig. 8.

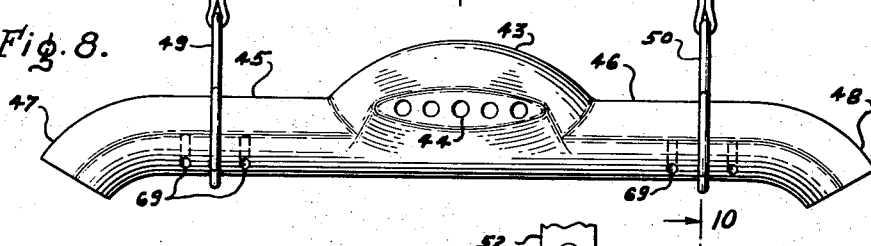


Fig. 9.

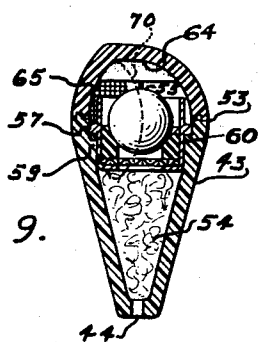
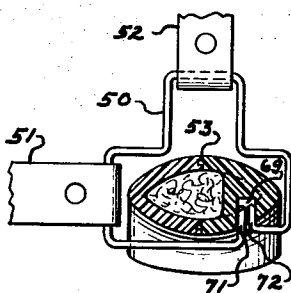


Fig. 10.



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UNITED STATES PATENT OFFICE

2,604,069

WEANING BIT

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Application September 27, 1950, Serial No. 187,045

6 Claims. (Cl. 119—134)

1

My invention relates to weaning bits, and more particularly to an improved weaning bit for a calf of the type embodying a gravity actuated valve.

An object of my invention is to improve the reliability of weaning bits, particularly adapted to the weaning of calves.

Further objects are to provide a calf weaning bit with a minimum of moving parts, in which all moving parts are enclosed within the bit itself, which may be readily disassembled for cleaning, and in which the valve or valves are not subject to malfunctioning as a result of any of the usual activities of a calf which may, for example, bring various kinds of twigs, grass, grain or other foreign matter into the region of the nose and mouth of the calf.

Hollow bits have heretofore been proposed comprising vents or apertures arranged to provide communication between the inside cavity of a calf's mouth and the outside atmosphere, thereby to prevent the building up of the suction within the mouth of the calf necessary to suckle from a mother cow. Unless provided with selectively actuatable valves, however, such a bit also prevents the calf from drinking from a pail or trough. In view of this undesirable effect, proposals have been made to provide external valve means arranged to close the vent to the atmosphere in response to the movement of some external parts of the bit or of the bit holding means. Such external valve arrangements are subject to malfunctioning, however, because of the exposed position and complexity thereof.

It is accordingly an important object of my invention to provide a hollow weaning bit comprising a simple, inexpensive construction without exposed moving parts which will reliably operate to prevent suckling and to permit drinking from a pail or trough.

It is also an object to provide a weaning bit comprising a valve which may be conveniently thoroughly protected by filtering means, and in which such means are readily replaceable.

The novel features which I believe to be characteristic of my invention are set forth with particularity in the appended claims. My invention itself, however, both as to its organization and method of operation, together with further objects and advantages thereof, may best be understood by reference to the following description taken in connection with the accompanying drawing in which Fig. 1 is a general view of a bit in accord with my invention in position in the mouth of a calf; Fig. 2 is an enlarged plan view of the bit taken with an upper half removed; Fig. 3 is a partially sectional front view of the bit; Fig. 4 is a sectional view on a reduced scale taken along line 4—4 of Fig. 2 showing a valve portion of the bit as it appears when the calf's

2

head is in position to attempt suckling from a cow; Fig. 5 is a sectional view on a reduced scale also taken along line 4—4 of Fig. 3 showing a valve portion of the bit as it appears when the calf's head is in position to suck milk from a pail; Fig. 6 is a perspective view of a modified bit in accord with certain aspects of my invention; Fig. 7 is a sectional view of the modified bit of Fig. 6; Fig. 8 is a front view of the modified bit; and Figs. 9 and 10 are detail sectional views of the modified bit taken along line 9—9 of Fig. 7 and line 10—10 of Fig. 8, respectively.

Referring now to Fig. 1 of the drawings, the bit comprises generally a bent hollow tube including a generally cylindrical central or intermediate portion 1 adapted to be disposed through the mouth of a calf 2. The central portion 1 lies preferably midway between end portions 3 and 4 which are formed approximately at right angles to the central portion. The bit is held in place by a strap 5 extending over the back of the head and a second strap 6 extending across the bridge of the nose much in the manner of a common bridle. Either or both straps may be provided with adjusting buckles or the like. The straps are so connected to the bit by a ring 7 for the head strap 5 and a ring 8 for the nose strap 6 that the bit is firmly held in the position in which the end portions 3 and 4 extend upwardly toward the back of the head approximately parallel with the mouth or with the top of the bridge of the nose. This position of the bit with respect to the head is such that in drinking from a pail the head of the calf would assume a position such that the end portions 3 and 4 would extend substantially vertically upwardly, and that in attempting to suckle the mother cow the head would assume a position in which the end portions would extend more or less horizontally or downwardly from the central portion. The bit is formed of an upper and a lower half, not necessarily of exactly equal size or shape, held together by countersunk bolts 9. The upper half carries a lug 10 at each side suitably drilled or apertured to hold ring 8 of the bridle and a lug 11 which cooperates with an additional lug formed in the lower half at each side to hold ring 7 of the bridle.

Fig. 2 is a plan view of the bit with the upper half removed to disclose the internal arrangement. Inside the bit are disposed a screen 12 positioned to cover an elongated aperture or slot 13 located to open forwardly from the center of the intermediate portion 1 of the bit. The slot 13 provides a path for air between a central chamber 14 of the bit and the front part of the mouth cavity of the calf. The chamber 14 is bounded by partitions comprising bent sheet members 15 and 16, which extend completely across the central opening or bore of the tubular

3

bit and which are seated in grooves 17 in the inner walls of the bit. Member 15 may be a metal sheet or plate bent or formed into a shape to provide transverse portions 18 and 19 extending laterally approximately half way across the inside of the bit, longitudinally displaced along the intermediate portion 1, and connected by a platform 20 of roughly square or rectangular configuration. Approximately centered in the platform is a circular indentation 21 extending toward the front of the bit and terminating in a circular port or opening 22. This port is adapted to be closed and sealed by a ball 23 caged within the indentation 21 and prevented by the back wall of the bit body from falling out of the indentation. Plate 15 and ball 23 thus cooperate to form a complete partition across the tubular body, comprising the gravity actuated ball check valve, whereby when the platform 20 of the sheet member 15 is horizontal, or only slightly tilted from the horizontal, with the indentation 21 extending downwardly, the ball 23 will roll into the sealing position shown effectively to isolate chamber 14 from the bore or opening 24 in the end portion 3 of the bit body, and when the platform 20 is tilted toward a vertical position, or a position with the indentation extending upwardly, the ball 23 will roll away from the sealing position into the position indicated, for example, by broken line 25, thereby to uncover the port 22.

Member 16, as shown in cross section, is similarly shaped and arranged with a ball 26 to provide opening and sealing, respectively, of the port 27 to control the communication between chamber 14 and the opening or bore 28 of the end portion 4 of the bit in correspondence with the action of ball 23 in connection with port 22. The open position of ball 26 is indicated by broken line 26'.

Screens 29 and 30 are arranged respectively to cover the open ends of the bit to prevent the entrance of foreign solid matter into the open portions 24 and 28 which might interfere with the operation of the ball valves. Screens 29 and 30, as well as screen 12, may be bound around the edges by crimped metal strips 31, 32 and 33, respectively, to prevent unravelling when the bit is disassembled for cleaning or other purposes.

The lower half of the bit as shown in Fig. 2 further comprises several bosses 34 extending upwardly inside the bit to be drilled and tapped to receive the threaded portions of the bolts provided to hold together the upper and lower halves of the bit body. The lower half further comprises external lugs 35 which cooperate with lugs of the upper half to hold the bridle head strap rings to the bit body.

As shown in the partially cut away front view in Fig. 3, the bit body upper and lower halves fit together in a lap joint 36 which extends along the abutting edges of the halves. Bolts 37 extend through bosses 38 of the top half and are threaded into the bosses 34 of the lower half to hold the halves together to form the tubular body.

The ball 23 is shown in position to seal port 22 in the platform 20 to isolate the central chamber from the end portion, whereby air will not be drawn into the chamber 14 from the end portion or through filter screen 29. A part of the screen 12, which prevents foreign matter from the calf's mouth from entering the chamber 14, is shown in this view, as are grooves 39, in each half, in which the platform 20 is seated for posi-

4

tioning and to reduce leakage of air therearound. Further shown in Fig. 3 are lugs 10 formed on the outside of the top half of the bit to hold rings 8, to which, in turn, the nose strap 6 of the bridle is attached.

Fig. 4 is a sectional view taken along the line 4-4 of Fig. 2 to show certain details of the construction, and further, with Fig. 5, to demonstrate the valve operation. In Fig. 4 the bit is in the position which it assumes when the calf raises his nose, and in Fig. 5 in the position assumed when the nose is depressed as when drinking from a pail. Arrows 40 in Fig. 4 indicate the flow of air, when the calf attempts to suckle, in through the end portion of the bit, through the open port 27, and out through screen 12 into the calf's mouth, not shown, while arrows 41 indicate the flow outside of the bit but within the mouth toward the calf's throat.

Fig. 4 further shows clearly the positions of lug 11, of the top half of the bit body, and lug 35, of the bottom half, positioned to hold the ends of ring 7 of the bridle, as well as lug 10 and a portion of the ring 8. This view also shows the groove 39 in which the edge of the platform portion of the sheet member having port 27 is disposed.

Fig. 5 is a similar view of the bit differing from Fig. 4 only in that the position causes the ball 26 to be seated. As here shown, no air may enter the calf's mouth through screen 12 since the ball 26 is seated, and the calf is, accordingly, permitted to suck air or liquid from the front of his mouth toward his throat in the direction of arrows 42 without breaking of the required suction within the mouth by the bit.

The bit may be readily disassembled for cleaning or servicing by removing bolts 37 and by deforming the preferably resilient ring 7 to remove the ends thereof from the bores or indentations in the respective lugs 11 and 35, as best seen in Fig. 4. Upon separating the upper and lower halves, the screens may be removed, as may the partition members and balls. If desired, the ends of rings 7 and 8 may be removed at any time from their lugs by a slight opening of the rings, whereby the bridle straps may be replaced. It is to be noted that the straps, and to a certain extent the rings as well as the backwardly extending end portions of the body, tend to maintain the bit against slipping to one side or the other of the calf's mouth.

Figs. 6, 7, 8, 9, and 10 are directed to a modified bit construction operative in a manner similar to that of the bit heretofore described but comprising a single ball valve, a forwardly extending central chamber isolable from both open ends by the single ball valve, mesh or wool filtering and shielding means, a shape differing from that heretofore described, and differing in certain other respects as understood from the following description.

Fig. 6 is a perspective view of the modified bit wherein the enlarged and forwardly extending valve housing and outlet portion 43, preferable but not essentially at or near the center of the bit, is arranged to be disposed on top of the tongue of the calf with the forward openings 44 toward the tip of the tongue. The body portions 45 and 46 extending from the portion 43 approximate a streamlined or elliptical cross-sectional shape to fit as closely as practical between the lips of the calf at the sides of the mouth, and these body portions terminate in downwardly curved end portions 47 and 48, respectively.

5

Rings 49 and 50 are provided at either side to retain a head strap 51 and nose strap 52 of a bridle arrangement similar to that shown in Fig. 1. The single rings of Fig. 6 may extend from the bit body sufficiently to insure against slipping of the bit to one side of the mouth and are preferably adjustable in position on the bit for different calf mouth widths. The bit in accord with this modification is preferably formed of front and back halves or members, each of which may be cast of a synthetic resin or so-called plastics material. These two halves are joined by a lapped, tongue-and-groove or, simply, a butt joint 53, and are, of course, only approximately halves of the bit body and differ in shape.

The internal construction of the bit is seen in the sectional view of Fig. 7. The forwardly extending valve housing portion 43, with front openings 44, contains a quantity of filtering material 54 which is preferably bronze wool but may be a wool of other relatively non-tarnishing metal or a wool of vegetable or animal fibers or hairs, or the like. The purpose of the restricted openings 44 and the filtering material is to prevent the entrance into the bit of any substances likely to clog the passages or to interfere with free operation of the valves.

The portion of the valve housing 43 which contains the material 54 comprises a central or intermediate chamber communicating freely, through the filtering material and the filtering or screening apertures, with the calf's mouth and isolable from the open ends of the bit in accord with the operation of a ball 55 in connection with a valve seat 56.

The valve and partition assembly which separates the chamber containing material 54 from the open ends of the bit comprises a sheet metal member or plate 57 bolted by bolts 58 to a boss 59 formed about the rearward open end of the isolable chamber, a washer 60 being interposed if desired, completely to close off the chamber at this end except for the opening or port through the valve seat 56, and, of course, this port may be sealed by the seated ball 55. At or near the center of the partition member 57 and extending therethrough is a short tubular member 61 having a crimped or inwardly flanged forward end 62 against which a disc 63 of screen material is seated. The screen disc 63 is held in place by the resilient, hollow, generally cylindrical valve seat member of which the rearward end is beveled to form valve seat 56.

The ball 55 is so arranged in respect to the seat 56 and tubular member 61 that it will roll away from the seat when the apertures 44 extend either horizontally or upwardly, and will roll onto and seat against the valve seat when the apertures extend downwardly. The ball is of such size, and the tubular member 61 is so arranged with respect to the rear wall 64 of the bit body, that the ball is caged in the tubular member though free to roll away from the seat by a distance equal, approximately, to half the diameter of the ball.

The portions 45 and 46 of the bit body each contain, in the hollow interior thereof, an inner screen member 65 and an outer or end screen member 66, each screen member being held in place by a suitable groove, as shown, or by bosses, in the interior wall of the bit body. Between the screens 65 and 66 is disposed a mass 67 of filter material similar to the material mass 54. Screens 65 and 66 serve not only a filtering and shielding function but serve to retain the masses

6

of material 67 in position to filter air entering from the ends of the bit and to prevent foreign objects or foreign matter from reaching the valve.

The forward and back halves or portions of the bit, meeting at joint 53, are held together by bolts 68 which thread into boss 59. The removal of the bolts 68, after removal of the bridle rings 49 and 50 of Fig. 6, will permit access to the screens 65 and 66, to the wool masses 67 between the screens, to the ball 55, and to the bolts 58. Removal of bolts 58 further permits access to the wool mass 54 and to the inner ends of apertures 44. The removed valve assembly may be further disassembled by pressing the screen 63 through the tubular member 61 to push out the resilient valve seat member. All parts may thus be inspected, cleaned, repaired and replaced as required.

Fig. 8 is a front view of the complete bit showing the general configuration thereof including the valve housing portion 43 the top of which is intended to fit near or against the roof of the mouth, the portions 45 and 46 which extend through the lips at the sides of the mouth, and the downwardly curved end portions 47 and 48 which are open at the extreme ends.

Fig. 8 further discloses the manner of mounting rings 49 and 50 for adjustment along the portions 45 and 46. The two ends of each ring are disposed together in a selected one of several indentations 69 formed in the bit body. As seen in Fig. 8, the rings are arranged for a mouth of middle width, while two other indentations are provided for each ring to permit the spacing between rings to be increased or decreased for wider or narrow mouths by selecting indentations spaced farther apart or nearer together.

Fig. 9 is a sectional view of the bit taken along line 9-9 of Fig. 7 and illustrates the shape of the valve housing portion 43. Ball 55 is shown seated with apertures 44 extending downwardly in the position assumed when the calf's head is lowered for drinking from a pail. Since the tubular member containing the valve seat member is cylindrical, as is the seat member, and the screen disc to keep the filter wool 54 from the valve seat and ball is circular, the view of this portion of the valve assembly is similar to that of Fig. 7.

Fig. 9 further shows the joint 53 between the two body portions forming the bit body, as well as a portion of the boss 59 against which the platform member 57 seats, with the heretofore described interposed gasket 60. Also seen in this figure is a portion of one of the screens 65, and the shape of the inner surface of the bit body beyond the portion 43 is indicated by a dotted line 70.

Fig. 10, taken along line 10-10 of Fig. 8, shows bridle ring 50 of which the ends 71 and 72 are disposed in an indentation 69 in the bit body. The ring 50 is preferably of spring steel or other resilient metal to permit the ends 71 and 72 to be removed from the indentation by deforming the ring, whereby the bridle head strap 51 or nose strap 52 may be replaced or the ring moved to another indentation for adjustment to a different width mouth as explained above in connection with Fig. 7. The joint 53, and the filtering material held in the portion of the bit body designated 46 in Figs. 6, 7, and 8, are further seen in this view.

The operation of the ball valve of the modification according to Figs. 6-10 is similar to that

of the ball valves of the bit in accord with Figs. 1-5. The resilient seat of the modified bit has the advantage of providing more perfect sealing, while the latter construction may be less expensive to manufacture. The bit of Figs. 1-5 is generally simpler to construct, while the modified arrangement is somewhat more efficient in operation. It will be understood that certain features of the one may be incorporated in the other and that various other changes may be made without departing from the true spirit and scope of the invention, since I have shown only certain preferred embodiments thereof. I therefore desire to have it understood that I intend, in the appended claims, to cover all such modifications as fall within the true spirit and scope of my invention.

What I claim as new and desire to secure by United States Letters Patent is:

1. In a weaning bit comprising an elongated hollow body member having open ends and an intermediate portion; said intermediate portion of said member being provided with a forward-opening mouth aperture, a partitioning plate at said portion forming a chamber vented by said aperture, said plate having an aperture opening forwardly into said chamber, and a check ball trapped behind said partitioning plate selectively to close said last aperture.

2. In a weaning bit in accord with the immediately preceding claim, a respective mass of filtering material between said portion and each said end, and a mass of filtering material in said chamber interposed between said apertures.

3. In a weaning bit comprising a hollow barrel member open at an end, said member being provided with a forward-opening mouth aperture intermediate the ends of said barrel member, a partition in said barrel defining therein an outlet chamber and an inlet chamber, said outlet chamber being in direct communication with said aperture and said inlet chamber being in direct communication with said open end, said partition comprising a central apertured portion, said apertures being substantially parallel, a check ball behind said partition, means loosely to trap said ball adjacent said partition aperture,

said means comprising said partition and a portion of the back of said barrel.

4. In a weaning bit in accord with the immediately preceding claim, a mass of filtering material in said inlet chamber adjacent said open end and spaced from said trapping means, and a mass of filtering material in said outlet chamber adjacent said mouth aperture and spaced from said partition aperture.

5. In a weaning bit for an animal, a hollow barrel member open at each end, a valve housing formed as an intermediate portion of said member, said housing forming a chamber and being perforated to vent said chamber into the mouth of the animal, a partition in said housing separating said chamber from the hollow interior of said barrel, a gravity actuated valve in said partition, perforate screening and retaining means in said barrel adjacent each said end, and masses of wool-like filtering material in said barrel and in said chamber disposed to protect both sides of said valve from foreign matter.

6. A weaning bit comprising an elongated hollow body open at the ends and having a forward-opening mouth aperture substantially midway between the ends, a forwardly apertured partition on each side of said first aperture within said body respectively to separate said first aperture from said ends, each said partition comprising valve means for the aperture therein selectively to control communication through said partitions, said means comprising check balls trapped behind said partitions.

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