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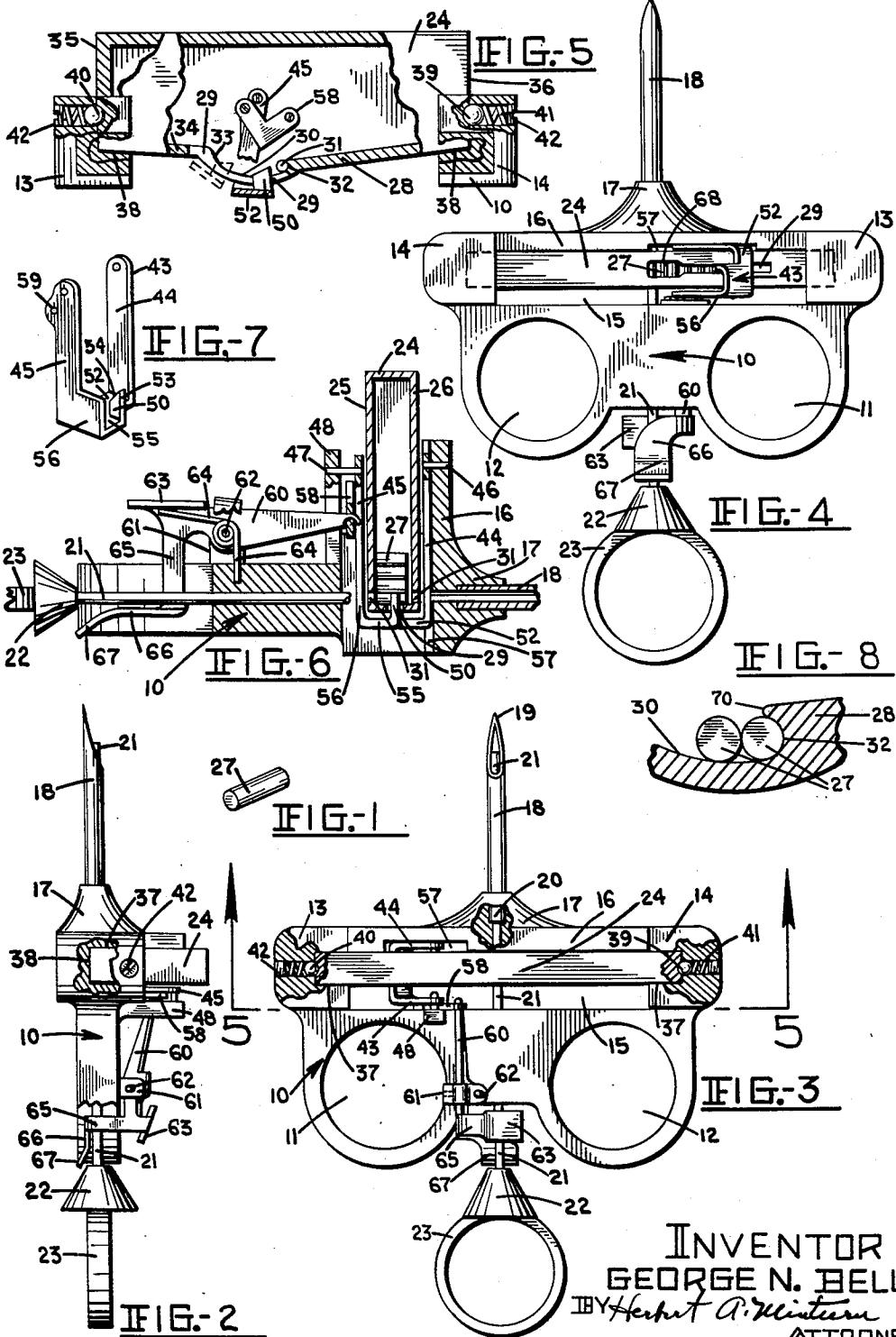
G. N. BELL

3,058,465

PELLET IMPLANTER

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2 Sheets-Sheet 1



INVENTOR
GEORGE N. BELL
BY *Herbert A. Minton*
ATTORNEY

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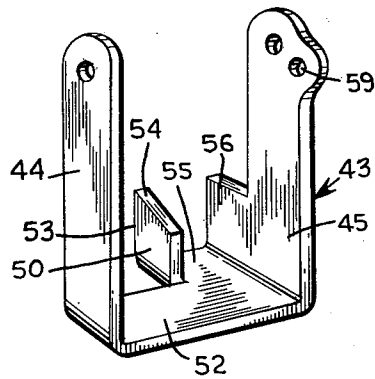
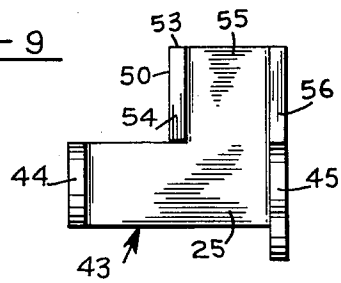
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FIG.- 9



IFIG.-10

INVENTOR
GEORGE N. BELL

BY Herbert P. Winter
ATTORNEY

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PELLET IMPLANTER

George N. Bell, 1417 Cornell Ave., Indianapolis 2, Ind.

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8 Claims. (Cl. 128—217)

This invention relates to a device for implanting pellets in cattle and poultry, or any other animal or fowl for the purpose of stimulating improved growth and fat deposits to produce tender and better flavored products. The pellets may be of different sizes and shapes, and the device for implanting them may be altered slightly without change in invention, any change residing in the magazine employed to carry the pellets.

For example, the pellets may be in either cylindrical or spherical forms. One particular ingredient of the pellets is a hormone product available under the name diethylstilbestrol.

A common practice is to implant one of these pellets under the skin, and this is done as a hypodermic injection, the pellet being injected through a hollow needle which has punctured the skin. Sizes of needles may be varied in accordance with the size of pellets which are required to traverse the hollow interior of the needle.

Primary objects of the invention are to provide a mechanical structure wherein there may be either a stationary or a removable magazine which could be preloaded with a number of pellets, one hundred to two hundred as examples, and this magazine may be removably carried by a supporting structure from which the injecting needle extends; an ejecting plunger traversing the needle as well as the magazine for forcing a pellet from the magazine and through the needle; means for insuring that there is a pellet present ahead of the ejecting member; and a safety device preventing operation of the ejector in the absence of a pellet being positioned in the magazine for movement into the needle.

These and many other objects and advantages of the invention will become apparent in the following description of one particular form of the invention as illustrated in the accompanying drawing in which

FIG. 1 is a view of a cylindrical form of pellet;

FIG. 2 is a view in side elevation in partial section of a structure embodying the invention;

FIG. 3 is a view in top plan and partial section;

FIG. 4 is a view in bottom plan;

FIG. 5 is a view in transverse vertical section on the line 5—5 in FIG. 3 illustrating the magazine mounting and pellet positioning mechanism;

FIG. 6 is a view in detail on an enlarged scale in longitudinal section centrally of the device;

FIG. 7 is a detail in perspective of the pellet finger;

FIG. 8 is a detail of a pellet restraining abutment; and

FIG. 9 is a bottom plan view on an enlarged scale of a yoke; and

FIG. 10 is a view in perspective on an enlarged scale and from the rear of the yoke.

A body generally designated by the numeral 10 has a pair of finger openings 11 and 12 therethrough. Arms 13 and 14 extend forwardly from the body 10 laterally spaced apart to leave an opening 15 therebetween. These arms 13 and 14 are interconnected by a front wall 16 herein shown as extending above the body 10.

On the forward side of the wall 16, a boss 17 is located centrally thereof in respect to the arms 13 and 14, and downwardly near the lower edge. A hollow skin puncturing needle 18 is provided with the usual sharpened pointed end 19, and enters the boss 17 by an opposite end 20 where it is frictionally retained against accidental displacement.

An ejector rod 21 is slidingly guided through the cen-

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tral portion of the body 10 between the finger openings 11 and 12, across the opening 15, through the wall 16, enters the needle 18, and is of sufficient length to traverse the entire length of the needle 18 when inserted from the rear of the body 10 as indicated in FIG. 3. This ejector rod 21 carries a cam member 22 herein shown as cone-shaped therearound at its rear end, and a thumb engageable circular band 23 extends rearwardly of the member 22. Upon placing the index finger of an operator in the hole 11 and the second finger in the hole 12, and the thumb within the band 23, the ejector rod 21 may be manipulated by the thumb so as to be reciprocated through the body 10, wall 16, and the needle 18.

A magazine herein described in the detachable form and generally designated by the numeral 24 is generally rectangular in shape and has an interior cavity between parallel side walls 25 and 26 which will receive pellets 27 therebetween with the flat ends of the pellets in sliding engagement with those two walls. This description is made in reference to a cylindrical pellet 27 as illustrated in perspective in FIG. 1. One particular size of this pellet is approximately three thirty-seconds of an inch in diameter and five thirty-seconds in length. The magazine 24 is preferably loaded at the plant wherein the pellets 27 are prepared, and the magazine is sealed so that the pellets are contained therein in end to end relation with the side walls 25 and 26, initially when the magazine is substantially filled with the pellets. Preferably the magazine 24 is made out of a transparent material such as a plastic so that observation may be had from time to time as to the quantity of pellets remaining in the magazine after a number of injections have been made.

While the pellets will normally drop by gravity in the magazine 24 when the magazine is positioned as indicated in FIG. 6 with the walls 25 and 26 vertically disposed, there may be a tendency for the pellets to bridge to leave an open space thereunder after some pellets have been taken from the magazine in the injecting process, and in order to insure a breaking down of the bridge so that the pellets will feed to the bottom of the magazine, and that a pellet will always be available for the injecting step, a feed means is provided.

Cooperating with the feeding mechanism is a specifically formed magazine floor. The floor, designated by the numeral 28 is provided with a slot 29 extending from a central zone to one side thereof. The floor 28 is generally sloped from both ends of the magazine toward the center, but that portion of the floor through which the slot 29 extends deviates from the slopes in general of the floor. As best indicated in FIG. 5, there is an arcuate portion 30, this arcuate portion 30 extending from the central zone to the left thereof as viewed in FIG. 5. The top surface of this arcuate portion 30 is given a radius of curvature in this one particular form being described of .625 inch. The right-hand end of this surface terminates in an upturned abutment having an arc having a radius of .047 inch which is substantially the curvature of the side of the pellet 27. A hole 31 extends through opposite sides 25 and 26 of the magazine 24, the margin of the hole on its right-hand side being a continuation of the arc 32 which turns upwardly from the curved surface 30.

The magazine hole 31 may be initially blocked to prevent pellets from falling out the hole when the magazine is being handled separately from the body, and this blocking is removed upon mounting the magazine on the body. In further reference to the abutment 32, FIG. 8, the curvature thereof is continued upwardly and around to a point 70 which would be spaced a bit to the right of a vertical diameter through a pellet bearing against the abutment. The floor 28 rounds around over the

pellet to merge through the point 70 into the curvature of the abutment 32.

Around the surface 30 to the left of the hole 31, the curvature thereof changes abruptly to enter into a continuing surface forming an inclined abutment 33. The left-hand end of this abutment 33 merges into the sloping surface 34 of the floor 28 of the magazine. The slot 29 continues through this abutment 33 and for a distance back in through the floor 34, see FIG. 5.

The magazine 24 is entered back of the wall 16 to have its ends 35 and 36 slidably enter slots 37, one vertically disposed in each of the members 13 and 14. The underside end portions of the magazine 24 are brought down against seats 38 provided in the members 13 and 14. The magazine 24 is held in that seated position by any means, herein shown as by the balls 39 and 40, one in each member 13 and 14, spring urged against the vertical ends of the magazine, FIGS. 3 and 5, the ends 35 and 36 being provided with shallow indentations receiving the balls 39 and 40 therein so as to retain the magazine, and yet permit the removal of the empty magazine by sufficient pull upwardly thereon to cause retraction of the balls into the members 13 and 14. Each ball is yieldingly urged toward the magazine ends by means of a spring 41 held against the ball by means of a screw plug 42 entering the members 13 and 14.

A yoke generally designated by the numeral 43 is rockably swung in the opening 15 of the body 10 by side arms 44 and 45 pivotally engaging by their upper ends respectively through pins 46 and 47 with an upper portion of the front wall 16 and a post 48 carried by the body 10 and extending upwardly from the rear margin of the opening 15. The axis of pivoting through the pins 46 and 47 of the yoke 43 is thus above the lower floor 28 of the magazine 24, and it is also located to the left of the vertical line through the hole 31 through the magazine.

An upwardly extending finger 50, FIG. 7, carried midway between the arms 44 and 45 by the interconnecting web 52 has a straight right-hand vertical edge 53 from the upper end of which on the opposite side there is a downward slope 54. The finger 50 is an upturned portion of an extension 55 of web 52, and from this extension 55 there extends a stop plate 56 upwardly and in parallelism with the arm 45. Thus, these component parts are embodied in the yoke 43, the web 52 being above described as interconnecting the side arms 44 and 45 of the yoke, the extension 55 described as extending from the web 52, and the finger 50 being located as midway between the arms 44 and 45, so that the finger 50 rockably swings as a part of the yoke 43. The arm 44 in the form herein shown, is mounted within a recess 57 extending vertically of the wall 16 so that the magazine 24 may remain against the wall 16 and at the same time the arm 44 is free to swing within the recess 57.

An angled lever 58 is rockably attached to the upper portion of the arm 45 at the pin hole 59, FIG. 7. This arm 58 normally disposed as indicated in FIG. 5 wherein one arm extends diagonally downwardly and from thence the other arm extends diagonally upwardly. The upturned arm of the lever 58 is rockably engaged by an end of a lever 60 which is rockably supported by a post 61 mounted on the body 10 adjacent the inner margin of the opening 11. The lever 60 is mounted on the pivot pin 62 and extends rearwardly therefrom to have an upper overturned thumb engaging plate 63. This plate 63, FIG. 3, is centrally located above the ejector rod 21. A torsion spring 64 surrounds the pin 62 to have one end bearing upwardly against the underside of the plate 63 and the other end turned downwardly and engaging in the body 10.

The lever 60 carries the leg 65 extending downwardly from the plate 63 and in turn carrying a foot 66 extending rearwardly and terminating in a downwardly extending cam 67 in the path of the conical member 22.

When the conical member 22 is shifted forwardly of the body 10, it engages the cam 67 and causes the lever 60 to rock to lift the right-hand end of the lever 58 in turn rocking the arm 45 of the yoke 43, thereby causing a corresponding left-hand travel of the finger 50 to traverse the slot 29 to the left to some such position as indicated by the dash lines in FIG. 5. This finger 50 can of course be carried farther to have the upper end of the finger entirely within the slot so that it does not appear above the curved surface 30 nor to the right of the abutment 33.

When the magazine 24 is carrying pellets 27, the left-hand swinging of the finger 50 will cause that finger, by reason of its inclined surface to pass under pellets normally dropping in the magazine by gravity to allow those pellets to flow down or drop down onto the curved portion 30, which in fact are ledges one on each side of the slot 29, and then upon return travel of the finger 50 under the biasing of the spring 64 to carry pellets ahead of the finger 50 to have the right-handmost pellet line up against the curvature 32 so that the pellets then are axially aligned with the holes 31, one on each side of the magazine 24. This action of the finger 50 in feeding the pellets along over the curved portion 30 is carried out normally when the ejector rod 21 is pushed inwardly to carry a pellet under the skin.

The abutment 33 restrains pellets 27 from being shifted along the floor 30 when the finger 50 travels toward the abutment 33, whereby the pellets will be lifted vertically to permit the finger to travel under the pellets while restrained from left-hand travel to permit the finger upon right-hand travel to come against the pellets resting on the curved floor 30 and urge them under pressure of the spring 64 around the floor 30 into compressive contact with the arcuate abutment 32, in turn holding the pellet which bears thereagainst from popping upwardly. Thus the pellets entrapped between the finger 50 and the abutment 32 are clamped effectively in position around the curving floor 30. By reason of that downwardly curving alignment of the pellets, the clamping effect is secured and maintained even though the magazine be turned upside down. Then when the ejector rod 21 is pulled rearwardly to have its forward end clear the magazine from its rear side, the spring 64 will carry the finger 50 to the right, carrying a pellet ahead thereof into hole alignment so that the device is then ready for a second pellet ejection through the needle 18 by pushing the rod 21 back through the magazine into contact with the end of the pellet and carrying it on through the needle 18. In the event that the magazine becomes empty, then when the ejection rod 21 is withdrawn, that is carried rearwardly of the magazine 24, the finger 50 will travel to the right and be positioned so that the forward end of the rod 21 will strike the stop plate 56 and cannot be entered through the magazine, thus warning the operator that no pellet is then available for injection.

If the failure of a pellet being presented for injection, is due to a bridging over action of the pellets within the magazine, then by observing that condition through the side of the magazine, the plate 63 may be rocked rapidly downwardly and released for a spring return to cause the pellets to drop downwardly. Of course the entire device may be rotated to shake the pellets loose, but to insure that there is a pellet available for the next injection, this rocking of the lever 60 by means of the thumb plate 63 will bring pellets into alignment along the curvature 30. The travel of the finger 50 to the left will not prevent a pellet being available for injection by reason of the fact that as the inclined surface strikes the pellets to the left of the finger, they will ride up and over and then drop down on the front side of the finger, which is particularly true since the abutment 33 prevents carrying the pellets to the left which may initially appear on the left-hand side of the finger 50. When the magazine 24 becomes empty, or for any other reason desir-

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able, the magazine 24 may be removed from the body 10. It is particularly advisable to remove the magazine when the device is in storage or being transported from place to place so that the ejector rod 21 does not accidentally slip out from a magazine otherwise present.

As indicated in FIG. 4, the slot 29 is provided with a widened end portion 68, the width of which is less than the length of the pellets 27, but is sufficiently great to permit pellets which may have become broken to drop therethrough or for any cause whatsoever a pellet has become turned from its normal position of end to end sliding engagement with the side walls of the magazine. The broken pieces or the turned pellet will readily drop through this widened portion 68 by manipulation of the thumb plate 63 so that a full sized pellet will be available for injection at the next operation of the device.

While I have herein shown and described my invention in the one particular form in minute detail, it is obvious that structural changes may be made particularly in the means of gripping the body and the injector rod, the magazine remaining a fixed part of the body, a retentive means for interengaging the magazine with the body, and other variations, and I therefore do not desire to be limited to that precise form beyond the limitations which may be imposed by the following claims.

I claim:

1. A pellet implanter comprising a body; a pellet magazine carried by said body; a floor in the magazine; a pair of opposing, parallel, magazine side walls; said magazine loosely carrying pellets between said walls, the pellets normally dropping downwardly onto said floor; said magazine having aligned holes through said walls at said floor; a pellet ejector rod slidably carried by said body axially of said holes; a finger reciprocally carried by said body; said floor having a slot longitudinally therethrough; means reciprocating said finger through said slot to a height approximately that of a pellet at said holes, and at a relatively lower height in reference to said floor at the end portion of the slot at its end removed from said holes to allow pellets to pass over said finger at said lower height and be presented on said floor between the finger and the slot end portion at said holes; a hollow pellet injector needle carried by said body axially aligned with and receiving therein said pellet ejector rod; and an abutment across said floor at said holes stopping pellet travel by said finger at a pellet position axially aligned with said holes.

2. A pellet implanter comprising a body; a pellet magazine carried by said body; a pellet ejector rod carried by said body; said magazine having aligned holes therethrough, through which holes said rod may travel; a lower floor in said magazine, said magazine having a slot through the floor extending transversely of the direction of travel of said rod; a finger rockably carried by said body and entering said slot from under said floor and extending into said magazine a distance sufficient to intercept a pellet resting on the floor across said slot; said holes being adjacent said floor; and an abutment across said floor limiting travel of pellets along the floor to that position of pellet alignment with said holes; said abutment having an arcuate side against which said finger urges a pellet, said arcuate side restraining the pellet from travel upwardly from axial alignment with said holes.

3. The structure of claim 1 in which said magazine curves downwardly from said holes and thence upwardly; said slot in said floor thereof extending to one side of said holes; an abutment across said floor at the side of said holes opposite from the extension of said slot; a raised portion of said floor forming a second abutment spaced from the first abutment and into which second abutment said slot extends; said floor curving upwardly into said second abutment; said reciprocating rockable means comprising a rocker member swingably carried by said body; said finger being carried by said rocker member, entering said slot, and extending above said floor;

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said finger traversing said slot upon rocking of said rocker member toward said holes in one direction and toward said second abutment in the opposite direction; and said reciprocating means interengaging said rocker and said rod upon injection travel of the rod urging said finger toward said first abutment.

4. The structure of claim 1 in which spring means normally yieldingly retaining said finger against pellets which lie on said floor between the finger and said first abutment, thereby clamping those retained pellets one against the other, floor, and said first abutment.

5. A pellet implanter comprising a body; a detachable pellet magazine having parallel side walls and a floor therebetween; means on said body receiving said magazine therebetween; means detachably retaining the magazine on said body; an injection needle carried by the body; a hole in each of said magazine wall, axially aligned one hole with the other; an injector rod slidably carried by said body in axial alignment with said needle; said magazine holes being axially aligned with said needle; said magazine having a slot through a portion of said floor to one side of said holes; a finger entering said floor; a rocker arm pivotally carried by said body and carrying said finger; an abutment on said rod; and means between said arm and said rod abutment swinging said finger away from said holes upon injection travel of said rod.

6. The structure of claim 5 in which there is a first pellet abutment at one end of said slotted floor portion and a second abutment at the side of said holes removed from said first abutment.

7. The structure of claim 6 in which said floor portion curves downwardly between the first and second abutments.

8. A pellet implanter comprising a body; a pellet magazine carried by said body; an injector rod carried by said body; said magazine having aligned holes therethrough, through which holes said rod may travel; means rockably carried by said body and swinging a part thereof into said magazine moving pellets in the magazine into position between said holes; a hollow injection needle traversable interiorly by said rod; said rod, upon reciprocation through said magazine holes, abutting a pellet in the magazine aligned with said holes and pushing it through and ejecting it from the needle; means biasing said part to a zone spaced from said holes; and means connected with said rod swinging said part toward said holes upon said rod travel theretoward; said magazine having a slotted floor portion extending normally of the travel of said rod; said part constituting a finger carried by said means and entering said slot from under the magazine floor and extending into said magazine a distance sufficient to intercept a pellet resting on said floor; an abutment on each side of said slot across said floor limiting travel of pellets along the floor to that position of alignment with said holes; said finger having a forward edge approximately radially disposed through said arcuate portion directed toward the end of the slot of said holes and having an upper end extending diagonally downwardly from said front edge; and an abutment on each side of said slot on said floor spaced from said first abutment; travel of said finger from said first abutment carrying it through said slot between and under the pellet contacting surfaces of said side of said second abutments, whereby pellets may pass down over said side abutments onto the arcuate floor onto said forward side of the finger.

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