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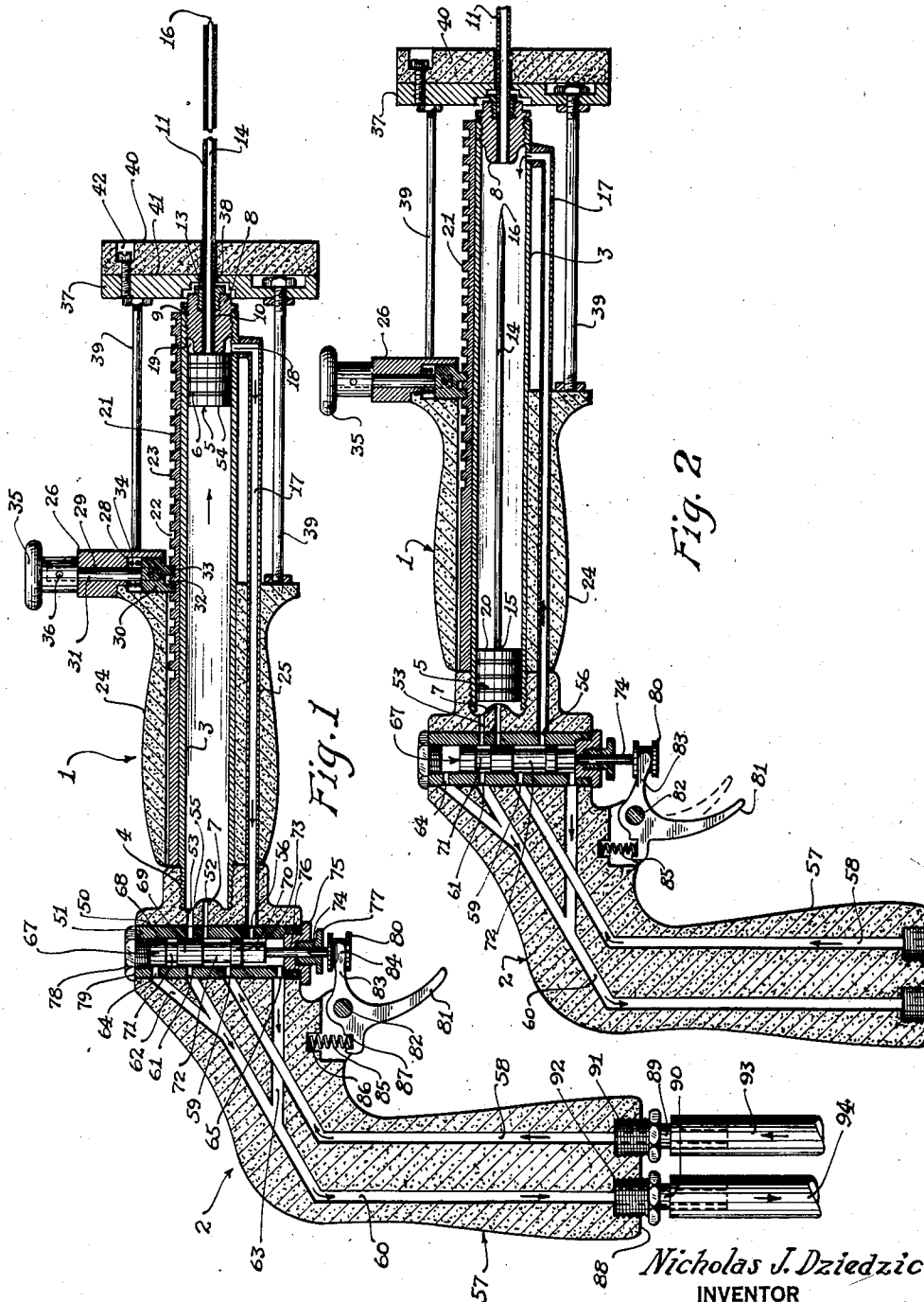
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2,110,263

FLUID INJECTION MEANS

Filed July 29, 1935

2 Sheets-Sheet 1



WITNESS -
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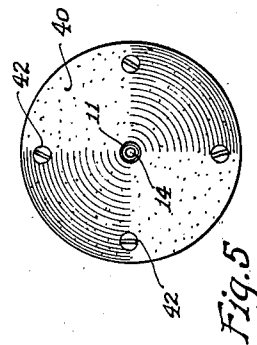
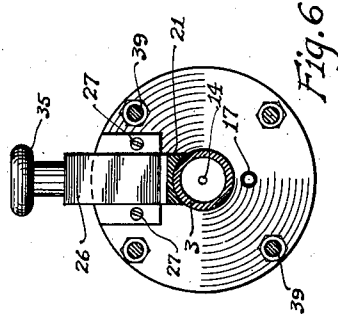
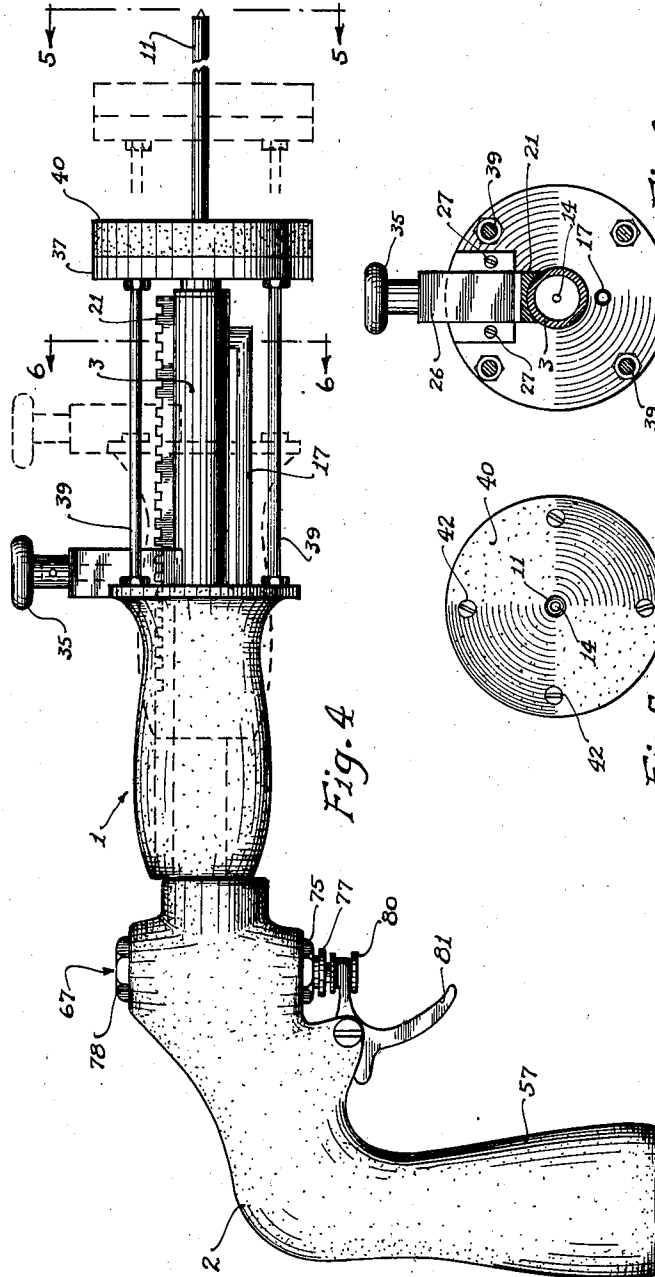
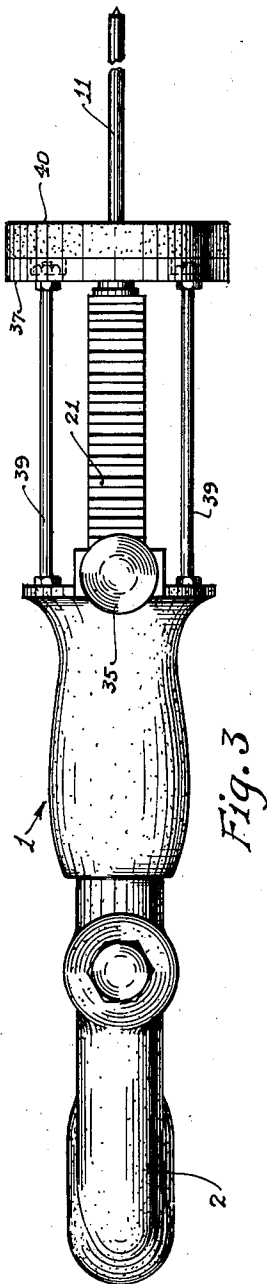
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FLUID INJECTION MEANS

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2 Sheets-Sheet 2



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FLUID INJECTION MEANS

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18 Claims. (Cl. 99—256)

This invention relates to a fluid injection means.

One of the objects of this invention is to provide an improved fluid injection means.

Another object of this invention is to provide a device for injecting a curing medium into the hollow interior of the bone of meat cuts.

Another object of this invention is to provide a device for injecting a curing medium under pressure into the hollow interior of the bone of meat cuts whereby it will be forced through the articular cartilage to the flesh surrounding the bone.

Another object of this invention is to provide a device for introducing a curing medium into the bone, the flesh or through the vascular system of cuts of meat.

Another object of this invention is to provide means for injecting a curing medium into the marrow of bone to prevent souring of the marrow.

Another object of this invention is to provide a device utilizing a needle for the injection of a curing medium into the marrow of bone, having novel means for preventing stoppage and clogging of the needle during the injection thereof.

Another object of this invention is to provide a needle for introducing a curing medium under pressure into cuts of meat, having means engageable with the outer surface of the product to prevent leakage of the curing medium at the point of insertion of the needle.

Another object of this invention is to provide a needle for introducing a curing medium into cuts of meat having means for positively limiting the insertion thereof.

Another object of this invention is to provide a device of this character having adjustable means for varying the depth of insertion of the needle.

Other objects will be apparent from the description and claims which follow.

In the drawings, similar reference characters in the several figures designate similar parts.

Figure 1 is a side view of a preferred embodiment of the present invention, partly in section, showing the needle closed, ready for insertion.

Figure 2 is a side view, partly in section, showing the needle as it will appear when in operation.

Figure 3 is a plan view of Figure 1.

Figure 4 is a side elevation, the sealing means being shown in full lines in a rearward position and in dotted lines in a partly forward position.

Figure 5 is an end view of the barrel portion of the device taken on line 5—5 of Figure 4.

Figure 6 is a transverse view of the barrel por-

tion, partly in section, taken on line 6—6 of Figure 4.

The device shown in Figure 1 comprises a barrel portion 1 and a stock portion 2.

Barrel 1 comprises hollow cylinder 3 threaded within stock 2 at 4. Piston 5 is slidably mounted within cylinder 3 and is provided with compression rings 6 to snugly engage the inner wall of cylinder 3. The movement of piston 5 is limited at the stock end of cylinder 3 by annular boss 7 and at the needle end of cylinder 3 by plug 8 threaded within cylinder 3 at 9.

Plug 8 is provided with opening 10 for the reception of tubular injection needle 11, which extends outwardly from cylinder 3. Needle 11, adapted for insertion into meat products, is securely held within opening 10 by plug 13 threaded within plug 8. Elongated pin 14 is secured at one end to face 20 of piston 5 at 15. When piston 5 is in the position shown in Figure 1, pointed end 16 of pin 14 extends slightly beyond the end of needle 11.

Conduit 17 communicates with cylinder 3 through port 18 and with cylinder 51 through port 56. Plug 8 is annularly recessed at 19 to permit fluid passing through port 18 to flow freely into cylinder 3 at a point slightly beyond the foremost movement of piston 5 and thus to apply pressure against face 20 thereof.

Rack 21 is rigidly secured to the outer face of cylinder 3 and is provided with a series of notches 22 having intervening spaces 23. Handle 24 is slidably mounted upon cylinder 3 and rack 21. Handle 24 is bored at 25 for the passage of conduit 17 by which it will be seen handle 24 is free to move lengthwise of cylinder 3 but is prevented from rotating thereabout.

Cap 26 is secured to handle 24 above rack 21 by screws 27 and is cut away at 28 and bored at 29 to permit reciprocal movement of dog 30 and stem 31, respectively. Dog 30 is provided with notches 32 having intervening spaces 33 to mesh with comparable spaces 23 and notches 22 on rack 21, respectively, and hold handle 24 in a fixed position on cylinder 3. Dog 30 is held in engagement with rack 21 by coil spring 34 interposed between it and cap 26. Knob 35 is secured to rod 31 by rivet 36 for manually raising dog 30 to alter the position of handle 24.

Plate 37, provided with opening 38, is slidably mounted at right angles to needle 11 and is rigidly secured to handle 24 by bolts 39. Cushion 40 of rubber or other resilient material is secured to face 41 of plate 37 by screws 42. As handle 24 is moved forward on rack 21, the extension of

needle 11 is relatively diminished, thereby providing means for varying the depth of insertion of needle 11 into the product. In practice, needle 11 is inserted the full depth permitted by cushion 40, which by reason of its resiliency, will conform to the contour of the product at the point of insertion and act as a sealing means to prevent loss of the curing medium resulting from back pressure. Without cushion 40, the curing medium issuing from tube 11 will have a natural tendency to follow the path of least resistance and flow backwardly to the point of insertion rather than through the product.

Stock portion 2 is provided with vertical bore 50 in which is rigidly secured cylinder 51. Ports 52 and 53 provide communication between cylinder 51 and cylinder 3. Port 52 is centrally disposed within boss 7 and serves to carry curing medium to cylinder 3 for applying pressure against face 54 of piston 5. Port 53 is disposed within recess 55 above port 52 and serves to empty curing medium from cylinder 3 upon pressure being applied against face 20 of piston 5.

Fluid inlet passage 58 and fluid outlet passage 60 extend from the butt end 88 of handle 57 to cylinder 51 and communicate with cylinder 51 through ports 59 and 61, respectively. Outlet passage 60 is provided with branch passages 62 and 63 communicating with cylinder 51 through ports 64 and 65, respectively.

Valve 67, having enlarged portions 68, 69 and 70 and reduced portions 71, 72 and 73 and stem 74, is reciprocally mounted within cylinder 51, the enlarged portions 68, 69 and 70 snugly engaging the inner wall of cylinder 51.

Cap 75, provided with opening 76 for the passage of stem 74, is threaded within cylinder 51. Gland coupling 77 is threaded within cap 75 about stem 74 to provide suitable sealing means at opening 76. Cap 78 is threaded within end 79 of cylinder 51. Movement of valve 67 is limited between caps 75 and 78 by reduced portion 73 and enlarged portion 68, respectively.

Trigger 81 is pivotally mounted within stock 2 by pin 82. Trigger 81 is provided with bifurcated arm 83 having enlarged heads 84 engageable with collar 80 secured to the free end of stem 74. Collar 80 and trigger 81 serve to actuate valve 67. Valve 67 is normally maintained against cap 78 by the action of coil spring 85 interposed between stock 2 and trigger 81 and rested within recesses 86 and 87, respectively.

Passages 58 and 60 are provided at the butt end 88 with extension nipples 89 and 90, threaded within recesses 91 and 92, respectively. Flexible supply line 93 extends from a source of curing supply not shown and is secured about nipple 89. Flexible return line 94 extends from nipple 90 to the source of curing supply to return thereto curing medium used in the operation of the gun, hereinafter described.

As shown in Figure 1, valve 67 normally rests at its uppermost limit. It will be seen, therefore, that a curing medium, such as pickling brine, forced through supply line 93 under pressure, will pass through passageway 58, port 59, around reduced portion 72, through port 52 and into cylinder 3 to apply pressure against face 54 of piston 5. Piston 5, by reason of this pressure, will be urged to its extreme limit against cap 8 and simultaneously push pin 14 through needle 11, thereby closing needle 11 to prevent stoppage and clogging of the same during its insertion into the product. When piston 5 strikes cap 8, point 16 of pin 14 extends slightly beyond needle 11

and serves to cut a neat slit for insertion of the needle into the product. Also, as piston 5 is urged toward cap 8 due to pressure against face 54, face 20 simultaneously forces the curing medium previously contained in the forward end of cylinder 3 through port 18, conduit 17, port 56, around reduced portion 73, through port 65, branch line 63, to return passage 60 and through return line 94.

As shown in Figure 2 of the drawings, when trigger 81 is drawn to the full line position, arm 83 actuates valve 67 and curing medium under pressure from supply line 93 flows through passageway 58, port 59, around reduced portion 72, through port 56, conduit 17 and port 18, to enter cylinder 3 and apply pressure against face 20 of piston 5. Pressure against face 20 urges piston 5 to the stock end of cylinder 3, forcing the curing medium previously directed against face 54 through port 53, around reduced portion 71, through port 61, and outlet passage 60 to return line 94. By movement of piston 5, pin 14 is withdrawn from needle 11 and the curing medium is directed through needle 11 to be diffused within the product.

When the desired quantity of curing medium has been injected, trigger 81 is released to return valve 67 to its normal resting position, thereby reversing the flow of curing medium to close needle 11 as previously described. Needle 11 may then be withdrawn from the product without waste of curing medium.

Port 64 and branch line 62 serve to prevent binding of valve 67 by carrying away curing medium trapped above valve 67 during the operation of the device.

Curing medium is preferably directed to the device at low pressure such that when it is desired to inject the curing medium into the marrow, the pressure will be sufficient to force the curing medium from the needle without blowing the marrow from the bone.

I claim:

1. A device of the class described comprising a cylinder, a tubular needle extending from one end thereof, a fluid actuated piston slidable in said cylinder and an elongated pin secured to said piston in relation to and slidable in said needle for closing said needle at the point of insertion to prevent clogging thereof.

2. A device of the class described comprising a cylinder, a tubular needle extending from one end thereof, a fluid actuated piston slidable in said cylinder and an elongated pin secured to said piston in relation to and slidable in said needle, said pin being operable by said piston and serving to close the needle at the point of insertion upon the piston being advanced to the needle end of said cylinder.

3. A device of the class described comprising a cylinder, a tubular needle extending from one end thereof, a fluid actuated piston slidable in said cylinder and an elongated pin having a pointed end extending from said piston in the direction of said needle, said pin being operable by said piston and serving to close the needle at the point of insertion, said pointed end protruding from said needle upon the piston being advanced to the needle end of said cylinder to cut a passageway for the insertion of said needle.

4. A device of the class described comprising a cylinder, a tubular needle extending therefrom, a fluid actuated piston slidable in said cylinder, means actuated by said piston for closing the end of said needle and valve means for alternately

directing fluid against opposite faces of said piston to actuate said needle closing means.

5. A device of the class described comprising a cylinder, a tubular needle extending from one end thereof, a fluid actuated piston slidable in said cylinder, means secured to said piston in relation to and slidable in said needle for closing said needle at the point of insertion, a valve, a fluid inlet and outlet communicating with said valve, a fluid conduit from said valve to the needle end of said cylinder, ports between said valve and the opposite end of said cylinder and means for directing fluid against said piston.

6. A device of the class described comprising a cylinder, a tubular needle extending from one end thereof, a fluid actuated piston slidable in said cylinder, means secured to said piston in relation to and slidable in said needle for closing said needle at the point of insertion, a valve, a fluid inlet and outlet communicating with said valve, a fluid conduit from said valve to the needle end of said cylinder, ports between said valve and the opposite end of said cylinder and means for directing fluid against said piston whereby to open said needle and pass fluid therethrough.

7. A device of the class described comprising a cylinder, a tubular needle extending from one end thereof, a fluid actuated piston slidable in said cylinder, means secured to said piston in relation to and slidable in said needle for closing said needle at the point of insertion, a valve, a fluid inlet and outlet communicating with said valve, a fluid conduit from said valve to the needle end of said cylinder, ports between said valve and the opposite end of said cylinder, means for directing the piston toward the needle for closing the same, means for directing the piston from the needle for opening the same and means for directing fluid through said needle when opened.

8. A pickle gun of the class described having a barrel portion and a stock portion comprising a cylinder, a tubular needle extending from the free end of said cylinder, a piston slidable in said cylinder, means carried on said piston for opening and closing said needle, a valve between said stock portion and said barrel portion, a fluid inlet and outlet in said stock portion communicating with said valve and ports between said valve and said cylinder, said valve constituting means for directing fluid to the piston whereby to open and close said needle and for directing fluid through the needle when opened.

9. A pickle gun of the class described having a barrel portion and a stock portion comprising a cylinder, a tubular needle extending from the free end of said cylinder, a piston slidable in said cylinder, means carried on said piston for opening and closing said needle, a valve between said stock portion and said barrel portion, a fluid inlet and outlet in said stock portion communicating with said valve, ports between said valve and said cylinder, said valve constituting means for directing fluid to the piston whereby to open and close said needle and for directing fluid through the needle when opened and means movable on said cylinder to vary the depth of insertion of said needle.

10. A pickle gun of the class described having a barrel portion and a stock portion comprising a cylinder, a tubular needle extending from the free end of said cylinder, a piston slidable in said cylinder, means carried on said piston for opening and closing said needle, a valve between said stock portion and said barrel portion, a fluid inlet

and outlet in said stock portion communicating with said valve, ports between said valve and said cylinder, said valve constituting means for directing fluid to the piston whereby to open and close said needle and for directing fluid through the needle when opened and means adjustable on said cylinder for carrying a plate movable in relation to said needle to vary the depth of insertion thereof.

11. A pickle gun of the class described having a barrel portion and a stock portion comprising a cylinder, a tubular needle extending from the free end of said cylinder, a piston slidable in said cylinder, means carried on said piston for opening and closing said needle, a valve between said stock portion and said barrel portion, a fluid inlet and outlet in said stock portion communicating with said valve, ports between said valve and said cylinder, said valve constituting means for directing fluid to the piston whereby to open and close said needle and for directing fluid through the needle when opened, a notched rack on said cylinder and adjustable means having a dog engageable with said rack for carrying a plate movable in relation to said needle to vary the depth of insertion thereof.

12. A pickle gun of the class described having a barrel portion and a stock portion comprising a cylinder, a tubular needle extending from the free end of said cylinder, a piston slidable in said cylinder, means carried on said piston for opening and closing said needle, a valve between said stock portion and said barrel portion, a fluid inlet and outlet in said stock portion communicating with said valve, ports between said valve and said cylinder, said valve constituting means for directing fluid to the piston whereby to open and close said needle and for directing fluid through the needle when opened, means adjustable on said cylinder for carrying a plate movable in relation to said needle to vary the depth of insertion thereof and resilient means secured to said plate to serve as sealing means at the point of insertion of said needle.

13. A pickle gun of the class described having a barrel portion and a stock portion comprising a cylinder, a tubular needle extending from the free end of said cylinder, a piston slidable in said cylinder, means carried on said piston for opening and closing said needle, a valve between said stock portion and said barrel portion, a fluid inlet and outlet in said stock portion communicating with said valve, ports between said valve and said cylinder, said valve constituting means for directing fluid to the piston whereby to open and close said needle and for directing fluid through the needle when opened, means adjustable on said cylinder for carrying a plate movable in relation to said needle to vary the depth of insertion thereof and a resilient cushion secured to said plate adapted to conform to the outer surface of the product and to serve as sealing means at the point of insertion of said needle.

14. In a device of the class described including a cylinder having a piston slidable therein, a tubular injection needle communicating with said cylinder and a pin slidable in said needle to close the end of said needle, said pin being connected with and operable by said piston.

15. In a device of the class described including a cylinder having a fluid actuated piston slidable therein, a fluid conduit communicating with said cylinder, means including a pin operable to close the end of said fluid conduit, said conduit closing means being connected with said piston and

adapted for slidable movement in said conduit, and means for alternately directing fluid against opposite faces of said piston to operate said conduit closing means.

5 16. In a device of the class described including a cylinder having a fluid actuated piston slidable therein, a tubular injection needle communicating with said cylinder, means including a pin operable to close the end of the passageway of said
10 tubular needle, said needle closing means being connected with said piston and adapted for slidable movement in the passageway of said tubular needle, and means for directing injection fluid
15 to withdraw said needle closing means from the passageway of said tubular needle.

17. A device comprising a cylinder having a piston slidable therein, a tubular injection needle communicating with the cylinder, a pin connected
20 with and operable by the piston and slidable

through the needle to close the end of the needle, a plate adjustably mounted for movement longitudinally of the needle to control the depth of insertion thereof, and resilient means secured to the plate providing a fluid sealing means at the
5 point of insertion of the needle.

18. A device comprising a cylinder having a piston slidable therein, a tubular injection needle communicating with the cylinder, a pin connected with and operable by the piston and slidable
10 through the needle to close the end of the needle, a plate slidably mounted at right angle to the needle, means for fixedly adjusting the plate longitudinally of the needle to control the depth
15 of insertion of the needle, and a cushion of resilient material secured to the plate providing a fluid sealing means at the point of insertion of the needle.

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