March 6, 1951 M. J. KUNERT 2,544,556

NOZZLE

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Fig. 1.

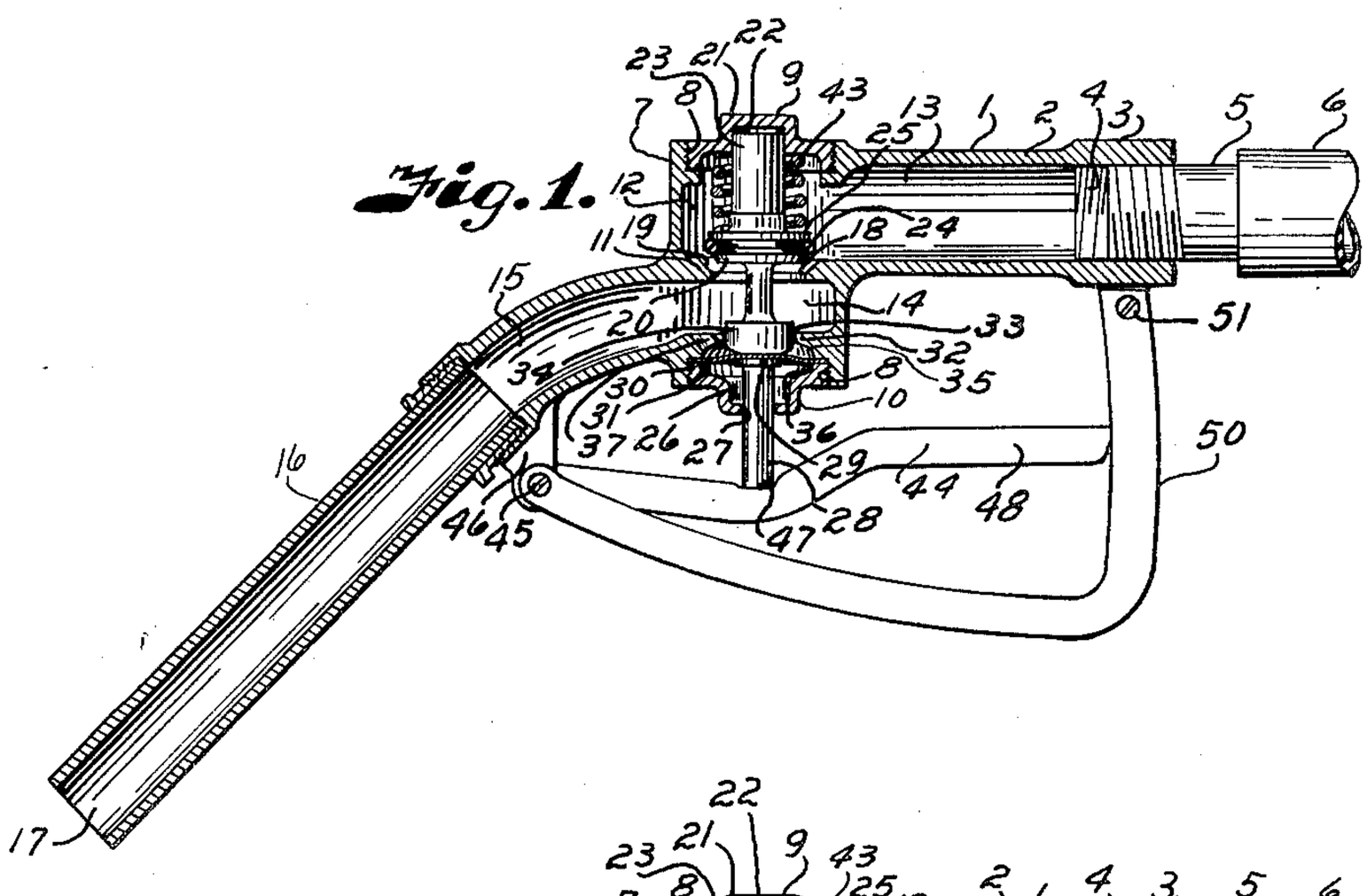

Fig. 2.

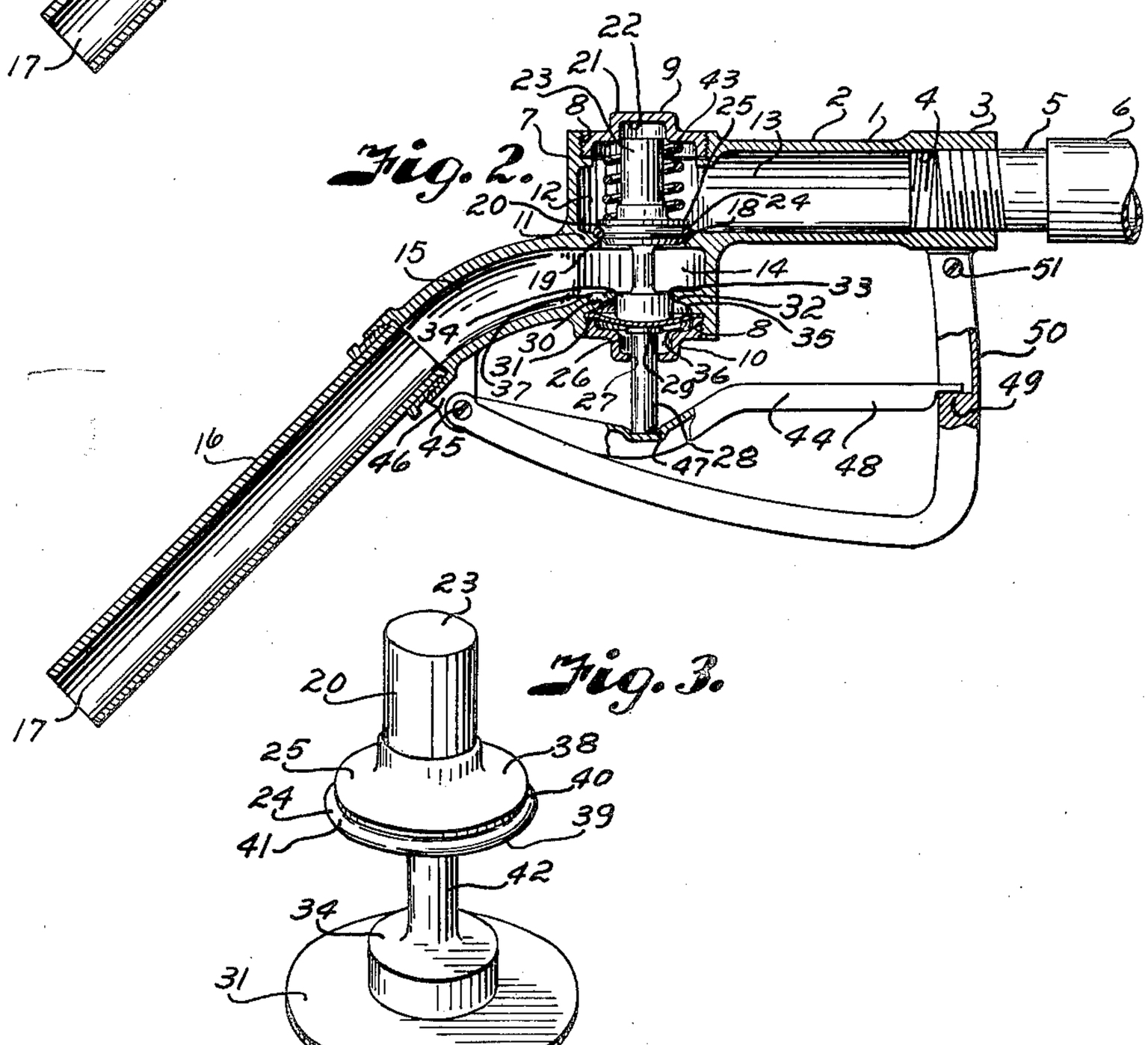

Fig. 3.

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NOZZLE

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1 Claim. (Cl. 299—149)

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This invention relates to a nozzle for dispensing liquids from a hose such as used in filling stations for dispensing gasoline into the fuel tank of a motor vehicle and has for its principal objects to provide a nozzle of this character that is of simple and inexpensive construction; to provide a nozzle with a trigger-operated valve which is leak-proof in that the valving element is operated by the trigger lever through a flexible diaphragm; to provide the nozzle with guides for retaining the valving element in alignment with its seat; and to provide the nozzle with means for limiting movement of the valve in opening direction and thereby save overstressing of the diaphragm.

In accomplishing these and other objects of the invention hereinafter pointed out, I have provided improved structure, the preferred form of which is illustrated in the accompanying drawing wherein:

Fig. 1 is a longitudinal section through a nozzle constructed in accordance with the present invention, the valve being shown in unseated or open position.

Fig. 2 is a similar section showing the valve in seated position for interrupting flow through the nozzle.

Fig. 3 is an enlarged perspective view of the valve element, diaphragm and actuating pin.

Referring more in detail to the drawings:

1 designates a nozzle constructed in accordance with the present invention and which includes a substantially tubular body or handle portion 2 having an integral collar 3 internally threaded as at 4 for mounting a nipple 5 to which a hose 6 is connected. The opposite end of the tubular body joins with a transversely arranged valve housing portion 7 internally threaded at the ends as indicated at 8 to receive closure plugs 9 and 10. Extending transversely within the housing 7 substantially in line with the bottom of the tubular portion 2 is a partition 11 dividing the cylindrical section into a valve chamber 12 connected with the flow passageway 13 of the tubular section 2 through port 14 and an outlet chamber 15 that is connected with an outwardly and downwardly curved nozzle portion 16 carrying a spout 17. The partition 11 is provided with a port 18 encircled by a bevelled seat 19 for seating a valving element 20 to close and open flow through the nozzle as later described.

The plug 9 has an exterior boss 21 which is recessed on the underside to provide a socket 22 for a cylindrical stem 23 of the valving member 20.

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To provide a positive leak-tight connection around the plug, it is turned against a gasket 24 that is carried on an internally extending flange 25. The opposite plug 10 is of similar construction and has a guide recess 26 coaxial with a guide opening 27 in which is mounted a pin 28 having a flanged head 29 reciprocable in the recess 26. The plug 10 cooperates with an internal annular shoulder 30 to clamp the marginal edge of a flexible diaphragm 31 therebetween whereby the diaphragm prevents leakage from the nozzle.

Extending inwardly from the shoulder 30 is an annular guide flange 32 forming an opening 33 for slidably guiding a head 34 on the valving member as later described. The plug and flange are recessed on the respective sides of the diaphragm as indicated at 35 and 36 to allow ample movement of the diaphragm upon actuation of the pin as later described. The flange 32 is provided with a vent opening 37 to prevent trapping of liquid on top of the diaphragm.

The valving member includes an annular disk-like portion 38 coaxial with the guide stem 23 and has a beveled face 39 provided with an annular groove 40 for mounting a resilient valve ring 41 adapted to engage the bevel seat 19 previously described. The outlet side of the valving element has a stem 42 that connects with the head 34. The valving member is normally retained in seated position by a coil spring 43 that encircles the guide stem 23 and has one end bearing upon the disk portion 38 of the valve and its opposite end against the plug 9. The guide stem 23 is of sufficient length so that when the valve is seated the upper end retains its guided relation in the socket 22 and the socket is of a depth to allow ample movement of the valve and provide stop engagement for limiting opening movement before the diaphragm contacts the guide flange 32 so as to save overstressing of the diaphragm. This is effected by locating the bottom of the socket 22 which forms the stop a less distance from the stem 23 than the space between the upper face of the diaphragm and the guide flange 32. When the valve is seated the head 34 of the valving member is retained in contact with the inner face of the diaphragm 31 as shown in Fig. 2 and the flanged head 29 of the pin 28 is retained in engagement with the opposite side of the diaphragm by means of a trigger lever 44 that is pivotally secured by a pin 45 with a depending ear 46 on the underside of the nozzle portion 16. The lever 44 extends downwardly from its pivotal connection to provide a seat 47 for the outer end of the pin 28. From the seat 47 the lever

extends upwardly at a slight angle and then laterally to form a finger grip portion 48 that is supported on the shoulder 49 carried by a guard 50 having one end fixed to the collar portion of the nozzle by fastening devices 51 and which has its opposite end extending below the finger portion of the trip lever and connected with the pivot pin 45 as shown in Figs. 1 and 2.

In assembling the valve element 20 within the nozzle, the diaphragm 31 is inserted through the open end of the housing portion 7 so that the marginal edge engages the annular shoulder 30 after which the pin 28 is inserted through the opening in the plug 10 and the plug 10 is engaged with the threads of the housing portion to clamp the diaphragm 31 in sealing contact with the shoulder 30. The coil spring 43 is sleeved over the guide stem of the valving element and the head 34 of the valving element is inserted so that it passes through the valve port 18 and guide opening 33 so that it rests on the upper face of the diaphragm 31. The plug 9 is then inserted and turned to compress the spring 43 and form a guide and stop for the stem 23 of the valving element.

In operating the nozzle, the tubular portion 2 is gripped in the palm of the hand with the fingers passing under the finger grip portion 48 of the lever 44 to rock the lever and effect movement of the actuating pin 28 against the diaphragm 31 which flexes the diaphragm in an inward direction to move the head 29 through the guide opening 33 and effect unseating of the valve disk 38 against action of the spring 43. The flow is then established from the hose through the valve port 18 as shown in Fig. 1. Upon release of the finger pressure on the trigger lever 44, the spring 43 returns the valve to seated position and shuts off flow through the nozzle.

From the foregoing it is obvious that I have provided a nozzle that is of simple and inexpensive construction that is leak-proof without the use of the conventional packing by reason of the diaphragm seal between the actuating pin and the head of the valving member. It is also obvious that the valving element is securely guided within the nozzle so as to retain it in axial alignment with the seat and that the guide stem provides a stop so as to save overstressing of the diaphragm upon opening movement of the valving element.

What I claim and desire to secure by Letters Patent is:

A nozzle of the character described including valve housing provided with a partition intermediate outlet and inlet passageways through said nozzle, said partition having a port encircled by a valve seat on the side of the inlet passageway, a valving member for said seat having a guide stem on the seating side of the valving member and a stem carrying a guide head on the unseating side, a spring normally retaining the valve in seated position, said housing having guides for said stem and head respectively, a diaphragm extending across said head and having its periphery in sealed engagement with the valve housing, said diaphragm being spaced from said head guide, a diaphragm actuating member engaging the opposite side of the diaphragm, and an operating lever pivotally mounted on the nozzle and engaged with the diaphragm actuating member to effect unseating of the valving member through said diaphragm, said guide means for the stem including a stop for engaging the end of the stem on the seating side of the valving member and spaced from the end of the stem a less distance than the spacing between the diaphragm and said head guide for limiting unseating movement of the valving member.

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