NATIONAL STANDARDS COMMISSION

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CERTIFICATE OF APPROVAL No 5/6A/38

VARIATION No 2

This is to certify that the following modifications of the patterns of the

"M" System Self-serve Driveway Flowmeter

approved in Certificate No 5/6A/38 dated 3 April 1973 and 30 June 1977 and subsequent variation

submitted by Production Engineering Co. Ltd,
Station Road,
Marton, New Zealand,

have been approved under the Weights and Measures (Patterns of Instruments) Regulations as being suitable for use for trade.

Dates of Approval: 9 November 1977, 7 February 1978

The approved modifications, described in Technical Schedule No 5/6A/38 - Variation No 2 and in drawings and specifications lodged with the Commission, provide for:

1. an STM 377 automatic hose nozzle,

2. an OPW 1AS automatic hose nozzle.

All instruments conforming to this approval shall be marked with the approval number "NSC No 5/6A/38".

Signed

J M Sandman

Acting Executive Officer

15/3/78

COMMONWEALTH OF AUSTRALIA

NATIONAL STANDARDS COMMISSION

Weights and Measures
(National Standards)
Act 1960-1966

Weights and Measures
(Patterns of Instruments)
Regulations

Certificate of Approval

CERTIFICATE NUMBER 5/6A/38

This Certificate replaces Certificate No 5/6A/38 dated 12 April 1972. *

In respect of the pattern of

Avery-Hardoll Driveway Flowmeter Model 4301/HR and Variants.

Submitted by: Email Ltd,
Industrial Products Division,
Joynton Avenue,
Waterloo,
New South Wales. 2017.

Manufactured by: Production Engineering Co. Ltd,
Station Road,
Marton,
New Zealand.

This is to certify that the pattern and variants of the instrument illustrated and described in this Certificate have been examined by the National Standards Commission under the provisions of the abovementioned Regulations and have been approved as being suitable for use for trade.

The pattern and variants were approved on 29 March 1972.

The pattern and variants are marked "NSC No 5/6A/38" and comply with the General Specifications for Measuring Instruments to be Used for Trade.

The submittor shall notify the Commission of the first ten instruments conforming to:

(a) the pattern and variants 1, 3, 4 and 6 (individual driveway flowmeters);

* NOTE: Pages 3 to 16 and Figures 1, 2, 4, 5 and 7 to 41 of the previous issue form part of the Certificate and must be retained.

Cont'd over

(b) variants 2 and 5 (high flow rate); and

(c) variant 7 (M-system),

submitted to State or Territorial Weights and Measures Authorities for verification.‡

The Commission reserves the right to examine the abovementioned instruments after verification.

Instruments purporting to conform to variant 7 (M-system) shall be tested in accordance with the procedure specified in the General Notes.

This Certificate comprises:

Pages 1 and 2 dated 3 April 1973.†
Pages 3 to 16 dated 12 April 1972.
Figures 5/6A/38 - 1 and 2 dated 12 April 1972.
Figure 5/6A/38 - 3 dated 3 April 1973.†
Figures 5/6A/38 - 4 and 5 dated 12 April 1972.
Figure 5/6A/38 - 6 dated 3 April 1973.†
Figures 5/6A/38 - 7 to 41 dated 12 April 1972.

Date of issue 3 April 1973.

Signed

A person authorized by the Commission to sign Certificates under the abovementioned Regulations.

‡ Inspectors should not verify any instrument conforming to this Certificate until advised in writing by the Pattern Approval Laboratory that the Commission has been notified.

† Pages 1 and 2 and Figures 3 and 6 were re-issued on 3 April 1973 to identify patterns with modified lighting arrangements.

DESCRIPTION OF PATTERN

The pattern (see Figure 2) is of a price-computing driveway flowmeter comprising the components tabulated in Column 5 of Figure 1, which, when assembled in a metal cabinet and arranged as shown in Figure 3, is known as the Avery-Hardoll Driveway Flowmeter Model 4301/HR. The hydraulic diagram is illustrated in Figure 4 and the maximum flow rate is 50 litres per minute.

DESCRIPTION OF VARIANTS

1. The components tabulated in Column 6 of Figure 1, assembled in a housing and with the components arranged as in the pattern (see Figure 3), make up variants known as the Avery-Hardoll Driveway Flowmeter Model 4301/HR.

   The hydraulic diagram is illustrated in Figure 4 and the maximum flow rate is 50 litres per minute.

2. The components tabulated in Column 7 of Figure 1, assembled in a housing and with the components arranged as in the pattern (see Figure 3), make up variants known as the Avery-Hardoll Driveway Flowmeter Model 4320/HR.

   The hydraulic diagram is illustrated in Figure 4 and the maximum flow rate is 90 litres per minute.

3. Two sets of the components tabulated in Column 8 of Figure 1, assembled in a housing and with the components arranged as shown in Figure 6, make up variants which comprise two flowmeters in a single housing, known as the Avery-Hardoll Dual Driveway Flowmeter Model 4301D/HR (see Figure 5).

   The hydraulic diagram of each flowmeter is the same as the pattern (see Figure 4), and the maximum flow rate is 50 litres per minute.

4. The components tabulated in Column 9 of Figure 1, assembled in a housing and with the components arranged as shown in Figure 8, make up variants known as the Avery-Hardoll Driveway Flowmeter Model 4301/E (see Figure 7).

The hydraulic diagram is illustrated in Figure 9 and the maximum flow rate is 50 litres per minute.

5. The components tabulated in Column 10 of Figure 1, assembled in a housing and with the components arranged as in variant 4 (see Figure 8), make up variants known as the Avery-Hardoll Driveway Flowmeter Model 4320/E.

The hydraulic diagram is illustrated in Figure 9 and the maximum flow rate is 90 litres per minute.

6. Two sets of the components tabulated in Column 11 of Figure 1, assembled in a housing and with the components arranged as shown in Figure 11, make up variants which comprise two flowmeters in a single housing, known as the Avery-Hardoll Dual Driveway Flowmeter Model 4301D/E (see Figure 10).

The hydraulic diagram of each flowmeter is the same as variant 5 (see Figure 9), and the maximum flow rate is 50 litres per minute.

7. The components tabulated in Column 12 of Figure 1, assembled, with the exception of Components Nos 30 to 32, in a metal cabinet and arranged similarly to variant 1 (see Figures 3 and 13), make up variants which are post-payment self-serve driveway flowmeters known as the M-system. The M-system (see Figures 12 to 15) comprises a control and printing unit (Components Nos 31 and 32), up to seven flowmeter modules (Component No 30) and up to fourteen driveway flowmeters.

The M-system permits an operator, located within sight of all of the driveway flowmeters, to supervise and control, by means of the control unit, purchaser operation of any of the driveway flowmeters. A printer provides the operator with printed tickets which are marked with the "pump" number, the quantity delivered and the price of the delivery.

On the operator's console, a mode-selection switch allows either "manual" or "M-system" to be selected.

With "M-system" selected, and with the driveway flowmeters authorized for use by the operator having pressed the authorize

buttons, the removal of any nozzle from its hang-up bracket on a driveway flowmeter will automatically start the pump motor, reset the computer to zero and allow the delivery to start. At the completion of the delivery return of the nozzle to the hang-up bracket will stop the pump motor and engage interlocks, which will prevent the pump motor being restarted, and prevent the computer being reset. A ticket will be printed automatically by the printer on the operator's console.

When the purchaser completes his transaction with the operator (or cashier), the operator, by pressing the particular authorize button, releases the driveway flowmeter for use by the next purchaser. The authorize button will be inoperative if the nozzle is not on the hang-up bracket.

The operator is provided with a master lock-out switch and individual driveway flowmeter lock-out switches which will stop all pump motors, or any individual pump motor. If the lock-out is operated during a delivery the pump motor will stop without engaging any interlocks and without causing a ticket to be printed. The delivery will continue without the computer resetting to zero when the lock-out is switched off. The return of a nozzle to the hang-up during lock-out will engage interlocks and cause a ticket to be printed.

With "manual" selected the driveway flowmeters are not controlled by the operator's console, no tickets are printed, and the computers may be reset to zero without using the authorize button.

A station "shut-down"/"operating" switch allows the operator to switch off the electrical supply to the system.

Disconnecting any of the driveway flowmeters from the pump module permits the driveway flowmeter so disconnected to be used in manual mode.

The hydraulic diagram of each flowmeter is illustrated in Figure 4 and the maximum flow rate is 50 litres per minute.

DESCRIPTION OF COMPONENTS

1. Pump — positive displacement.

2. Gas separator with integral float chamber and non-return valve — Avery-Hardoll PP11 (see Figures 16 and 17) in which gas separation is achieved by reducing the velocity of the liquid and allowing the gas to rise to the surface. A valve in the top of the gas separator is opened by a float when the level of liquid in the gas separator falls, due to an accumulation of gas, allowing the gas and a quantity of liquid into the float chamber.

   Gas entering the float chamber is discharged through a 10-mm OD tube to the upper extremity of the hose-nozzle holster; liquid which accumulates in the bottom causes the float-operated valve to open, allowing the liquid to return to the suction side of the pump.

   A spring-loaded non-return valve is located in the outlet from the gas separator. The valve opens when the differential pressure across the valve and pump suction on the underside of the valve overcomes the thrust of the spring.

3. Gas separator with integral float chamber and non-return valve — Avery-Hardoll PP11X, the same as Component No 2 except that the valve between the gas separator and the float chamber has a larger diameter orifice.

4. Gas separator test valve — enables testing of the gas separator by allowing air to be introduced into the liquid on the suction side of the pump. A cover over the valve is held in position by a screw which is located beneath a stamping-plug seal.

5. Meter — Avery-Hardoll PM400, 4-piston radial (see Figure 18), which has an output of 0.568 litre for each revolution of the drive shaft. The meter is sealed by two brackets, each of which is held in position by a screw, which is covered by a stamping plug, over each of the two meter-calibration adjustments located on opposite sides of the meter.

6. Solenoid valve 01250 (see Figure 19) — located in the delivery pipe downstream from the meter. The valve, which opens only when the pump is running and after the computer has reset to zero, prevents liquid from passing through the meter before the computer has reset to zero.

   Referring to Figure 19, the valve consists of five major parts,

body 1, coil 2, armature 3, piston 4 and seat 5. When coil 2 is not energized and the pump applies pressure at inlet 6, piston 4 remains firmly in contact with seat 5, as the pressure on the bottom of the piston is also applied to the larger area on the top of the piston through passage 7.

If power is applied to coil 2, the magnetic field lifts armature 3 and connects chamber 8 above the piston to the downstream side 9 of the solenoid valve through port 10. As port 10 is larger than passage 7, the pressure above the piston will fall, allowing the piston to rise from seat 5, and thus allowing the liquid to flow.

When the power to the coil is removed, the armature drops, closing port 10, which allows the pressure on the top of the piston to increase and close the valve.

7. Computer — Veeder-Root 1613 with automatic reset (see Figure 20), which is a 4-drum decimal-currency unit indicating price to $99.99, unit price to 99.9 cents per litre in 0.1-cent increments, and quantity to 999.9 litres. The computer is similar to the Veeder-Root 1613 computer as described in Certificate No 5/6A/6, except for the following significant modifications:

   (a) the right-hand price and quantity indicating wheels have ten graduations numbered 0 to 9;

   (b) all other price and quantity wheels are numbered 0 to 9;

   (c) the price-posting wheels are each numbered 0 to 9;

   (d) the semi-automatic reset mechanism has been replaced by an automatic belt-driven reset mechanism;

   (e) the gear ratio of the quantity drive gear to the composite bevel output gear is 1 : 2; and

   (f) the gear ratio between the meter drive shaft and the variator input shaft is 1.136 : 1.

8. Computer — similar to Component No 7 except that:

   (a) the unit price is indicated to 99.9 cents per gallon in 0.1-cent

increments;

(b) the quantity is indicated to 999.9 gallons;

(c) the gear ratio of the quantity drive gear to the composite bevel output gear is 1 : 4; and

(d) the gear ratio between the meter drive shaft and the variator input shaft is 1 : 2.

9. Computer — Veeder-Root VR101 with automatic reset (see Figure 21), which is a 4-drum decimal-currency unit indicating price to $99.99, unit price to 99.9 cents per litre in 0.1-cent increments and quantity to 999.9 litres. The computer is similar to the Veeder-Root VR101 computer as described in Certificate No 5/6A/30, except for the following significant modifications:

(a) the right-hand price and quantity indicating wheels have ten graduations numbered 0 to 9;

(b) all other price and quantity wheels are numbered 0 to 9;

(c) the semi-automatic reset mechanism has been replaced by an automatic belt-driven reset mechanism;

(d) the gear ratio of the quantity drive gear to the composite bevel output gear is 1 : 2; and

(e) the gear ratio between the meter drive shaft and the variator input shaft is 1.136 : 1.

10. Computer — similar to Component No 9 except that:

(a) the unit price is indicated to 99.9 cents per gallon in 0.1-cent increments;

(b) the quantity is indicated to 999.9 gallons;

(c) the gear ratio of the quantity drive gear to the composite bevel output gear is 1 : 4; and

(d) the gear ratio between the meter drive shaft and the variator input shaft is 1 : 2.

11. Computer reset and zero mechanism (see Figures 20 to 24) —

Referring to Figure 22:

The removal of the nozzle from the hang-up bracket allows the starting lever to rise and, through a pinned non-adjustable linkage, operate the pump motor switch. A second linkage from the pump motor switch through the computer initiates the computer reset.

Referring to Figures 23 and 24:

Computer reset mechanism — the pump motor drives the V-pulley 1 which through gear 2 drives gear 3. Gear 3, which is free to rotate on the shaft 4, drives the cam 5 through the ratchet 6. When the nozzle is removed from the hang-up, catch 7, which disengages the ratchet at the end of each reset cycle, is momentarily lifted by the pawl 8, through the shaft 9, allowing the ratchet to engage for one revolution of gear 3. Cam 5, which is driven by the ratchet and which is restrained at the end of each reset cycle by the spring-loaded roller 10, turns shaft 4 and thus the segmented gear 11, which in turn resets the price and quantity wheels to zero. A second cam 12, on the other end of shaft 4, moves the bar 13, releasing the drives to the price and quantity wheels to allow resetting; and

Computer zero mechanism — shaft 9, which rotates clockwise when the nozzle is removed from its hang-up, rotates lever 14 and arm 15 so as to position the narrow section 16 of the arm 15 below the roller 17, which is mounted on the lever 18. At this time the solenoid valve switch, which is operated by the spindle 19 on lever 18, is open and thus the solenoid valve is closed.

When the computer resetting cycle is almost complete and cam 12 has moved bar 13 to re-engage the drives to the price and quantity wheels, the pin 20 on cam 5 contacts the pawl 21, releasing pin 22, which in turn allows lever 18 and the arm 23 to rotate in an anti-clockwise direction. Spindle 19 on arm 23 closes the solenoid valve switch, energizing the solenoid valve, which opens, allowing the delivery to commence.

Replacement of the nozzle on its hang-up opens the pump motor

microswitch, which stops the pump motor and causes shaft 9 to rotate anti-clockwise, moving lever 14 and arm 15 so as to position the wide section of arm 15 below the roller 17. Roller 17, lever 18 and pin 22 are lifted by arm 15 and pin 22 engages above the nose 24 on pawl 21, and the arm 23 through spindle 19 opens the solenoid valve switch, causing the solenoid valve to close.

12. Sight glass — Avery-Hardoll AHQ70A (see Figure 25), full-flow type located on the end of the radial arm.

13. Sight glass — Avery-Hardoll AHQ80 (see Figure 25), by-pass type.

14. Back-pressure valve — Avery-Hardoll AHQ73 (see Figure 26), located downstream of the meter between the inlet and outlet pipe of the partial-flow sight glass; it ensures that liquid flows through the sight glass by creating a pressure difference between the inlet and outlet pipes.

15. Hose — external $\frac{3}{4}$-inch bore.

16. Hose — external retractable $\frac{3}{4}$-inch bore.

17. Swivel hose coupling — fitted between the nozzle and the hose to allow the nozzle to rotate about the axis of the hose.

18. Final filter — as described in Certificate No 5/6A/1/3.

19. Nozzle — Avery-Hardoll PP10C manual hose nozzle (see Figures 27 and 28).

20. Nozzle — Avery-Hardoll Autostop AHQ77 automatic hose nozzle (see Figures 29 and 30).

21. Pump interlock — the starting lever (see Figures 31 and 32) prevents the nozzle being placed on its hang-up bracket without stopping the pump motor, closing the solenoid valve, and engaging an interlock which prevents the solenoid valve from opening until the computer has reset to zero.

22. Dial face — on each side of the housing behind a glazed window

is a single white dial face with black markings. The quantity aperture and the unit-price aperture are marked "litres" and "cents per litre" respectively (see Figure 33).

23. Dial face — Component No 22 with the apertures marked "gallons" and "cents per gallon" (see Figure 34).

24. Dial face — on each side of the housing behind a glazed window is a dual white dial face with black markings. The quantity apertures and the unit-price apertures are marked "litres" and "cents per litre" respectively (see Figure 35).

25. Dial face — Component No 24 with the apertures marked "gallons" and "cents per gallon".

26. Nameplate — marked "approved for petroleum ≤ 1 mm^2/s", which means that the instrument is approved for liquid petroleum of viscosity not more than 1 mm^2/s (1 cSt).

27. Driveway flowmeter number (see Figure 12) — the driveway flowmeter is identified by a number which is the same as the "pump" number on the corresponding printed ticket.

    This number is marked, in figures not less than 100 mm high, in any position on the driveway flowmeter, provided the dial faces and nozzle hang-up are not obscured, and provided the number is visible to the operator at the control unit at all times, and visible to the purchaser when using the driveway flowmeter.

28. Pulse-transmitter unit (see Figures 36 to 38) — which is located on the side of the computer (see Figure 13). The quantity and price-information shafts in the computer, through extension shafts and gearing, drive two encoders each consisting of a rotating disc chopping a light beam. The light is detected by photo transistors.

    The output from each encoder is 50 pulses for each revolution of the right-hand quantity and price-indicating wheels on the computer.

    A third extension shaft from shaft 9 (see Figures 23 and 24) on the computer, which is operated by the starting lever, operates a

pump-motor reed switch which in conjunction with the pump-motor switch operates a triac switch supplying power to the pump motor. When both switches are closed by the starting lever the pump motor will run provided the control reed switch is closed. The control reed switch, which is normally closed, is open only when the authorize button has not been pressed, or if the flowmeter has been locked out.

A third reed switch provides a nozzle-on-hang-up signal to the flowmeter module when the nozzle is returned to its hang-up.

29. Pulse-transmitter unit — alternative to Component No 28, in which the gear ratio, from the quantity and price shafts of the computer to each of the encoding discs, is the same, and each encoding disc has the same number of holes in it.

30. Flowmeter module (see Figures 15 and 38) — comprising controls and memory for each of two driveway flowmeters which may be used separately or together.

The operator has two controls for each driveway flowmeter, an authorize button and a lock-out switch. Each of the authorize buttons, which are located on the top of the module on the operator's control panel (see Figure 14), authorizes the use of one driveway flowmeter. Pressing an authorize button closes the control reed switch in the transmitter unit, which allows the pump motor to be started and the delivery to commence when the nozzle is removed from the hang-up. If the nozzle is not on the hang-up when the authorize button is pressed, it will have no effect and the pump motor will not start.

During the delivery the first three and then each five subsequent 0.2-cent price pulses from the transmitter unit are entered into the memory store as 1 cent each to a maximum capacity of $131.07. The quantity pulses are entered directly into the memory to a maximum capacity of 310.72 litres or gallons. The occurrence of either of these numbers indicates a fault in the system.

Lock-out switches are located on the front of each module (see Figure 15). Each switch causes the control reed switch in the appropriate transmitter unit to open, stopping the pump motor.

Closing the lock-out switch will allow the pump to restart and continue the delivery.

Provided a delivery has taken place, the nozzle-on-hang-up signal will:

(a) open the control reed switch in the transmitter unit, preventing the pump motor from running until the authorize button is pressed again; and

(b) initiate a transfer of the driveway flowmeter number, and the price and quantity stored in the memory, to the print control memory in the M-system control unit. This returns the module memory to zero.

If a nozzle-on-hang-up signal is received without a delivery having taken place, the signal will have no effect, and the subsequent removal of the nozzle from its hang-up will restart the pump motor without a further operation of the authorize button.

A lamp may be associated with each authorize button, in which case the lamp will be on when the delivery has been completed, that is, when the nozzle-on-hang-up signal has been received. Pressing the authorize button to allow the next purchaser to use the driveway flowmeter will extinguish the lamp. The removal of the nozzle from the hang-up before the previous customer has paid the cashier will cause the lamp to flash.

An audible alarm may be associated with the flashing lamp.

31. M-system control unit (see Figures 14 and 15) — provides system controls and printer control and memory.

When the nozzle is returned to its hang-up, the nozzle-on-hang-up signal causes the pump-selection counter to scan the flowmeter modules, and stop when the pump module with a nozzle-on-hang-up signal is reached; thus only one set of data is transferred to the print control memory at one time. The data comprising the pump number, the price and the quantity is transferred in sequence to the printer-control counter. This information is then available to the printer, which sequentially prints each character and

automatically feeds the ticket from the printer. Incorrect information transfer may be indicated by a print of memory capacity.

Three controls are provided, marked "mode", "station" and "M-system pump".

The mode switch selects either "manual" or "M-system" operation; on manual it permits all of the driveway flowmeters to be used by an operator without supervision from the central control point, and allows the computers to be reset to zero without the use of the authorize button. On "manual" the printer does not operate.

Switching to "manual" during a delivery allows the delivery to continue, but there will be no ticket printed when the nozzle is returned to the hang-up. Switching to "M-system" during a delivery will stop all pump motors, and each driveway flowmeter will require authorizing before a new delivery may start.

The "station" switch selects either "shut down" or "operating"; on "shut down", it switches the system off by opening the electrical supply contactor.

The M-system pumps switch selects "lock-out" or "operating"; on "lock-out" it stops all the pump motors, in a similar manner to each of the flowmeter module lock-out switches.

32. Printer — Friden Model 147 or Model 1150/51 (see Figure 39), which prints the "pump" number, price and quantity on a continuous roll of preprinted paper to provide a printed record of each transaction (see Figures 40 and 41). The tear-off ticket which automatically feeds from the printer is not less than 17 mm in length.

GENERAL NOTES

Test Procedure

The following tests will apply to all instruments manufactured in accordance with variant 7 (the M-system):

1. Select "manual" mode of operation.

2. Carry out the tests normally applied to a driveway flowmeter. During these tests, check that the solenoid valve prevents any delivery until the computer has reset to zero.

3. Check that no tickets were printed in step 2.

4. Select "M-system" mode of operation, and observe that all of the driveway flowmeter authorize buttons light up.

5. Authorize all of the driveway flowmeters by pressing the authorize buttons. All of the lights will go out.

6. For each driveway flowmeter:

   (a) deliver sufficient liquid to cause the price and quantity indicators on the computer to move significantly off zero;

   (b) stop the pump motor by returning the nozzle to the hang-up bracket;

   (c) record the pump number and the quantity and price indicated on the computer; and

   (d) remove the nozzle from the hang-up bracket and check that the computer does not reset to zero and the pump motor does not restart.

7. If illuminated authorize buttons are fitted, check that they are all flashing. The flashing lights and audible signal may be stopped by re-authorizing all of the driveway flowmeters.

8. Check that the printed tickets agree with the quantity and price indications as recorded for each driveway flowmeter. The indications of quantity and price on the printed tickets may differ from those indicated on the computer by ± 0.6 cent and ± 0.02 litre or gallon.

9. Check that the operation of the lock-out switch during a delivery does not cause a ticket to be printed and allows the delivery to continue when the operating position is selected. Returning the nozzle to its hang-up during lock-out will cause a ticket to be printed and prevent the delivery from being continued when the

operating position is selected.

If it is desired to isolate a driveway flowmeter from the M-system during the above tests, in order to allow the service station to continue functioning, the driveway flowmeter can be isolated by removing its plug from the pump module.

NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No 5/6A/38

VARIATION No 1

Pattern: Avery-Hardoll Driveway Flowmeter Models 4301/HR and Others

Submittor: Production Engineering Co. Ltd,
Station Road,
Marton, New Zealand.

Date of Approval of Variation: 13 August 1976

The modifications described in this Schedule apply to the patterns described in Certificate No 5/6A/38 dated 3 April 1973.

All instruments conforming to this approval shall be marked "NSC No 5/6A/38".

Description:

The approved modifications provide for -

1. A ZVA Slimline automatic hose nozzle (see Figures 42 and 43). The anti-drain valve which is integral with the main valve retains a pressure of not less than 15 kPa.

2. A Friden Model 1100 ticket printer which is electrically similar to the Model 147.

3. An output on the "M" system to provide "total price" information to non-trade use peripheral equipment. A totalizer marked "not in use for trade" may be fitted to the "M" system console.

FC

NATIONAL STANDARDS COMMISSION

CERTIFICATE OF APPROVAL No 5/6A/38

This is to certify that the Commission has authorised the withdrawal of the approval, under the Weights and Measures (Patterns of Instruments) Regulations, of the

"M" System Self-serve Driveway Flowmeter

advised in Certificate of Approval No 5/6A/38 dated 3 April 1973 and Certificate of Approval No 5/6A/38 - Variation No 1 dated 16 September 1976.*

The withdrawal will take effect as from 30 June 1977.

Signed

Executive Officer

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* The approval of the "M" System self-serve driveway flowmeter is being withdrawn as the design encourages the operator to "free" a flowmeter for use, and thereby cancel the primary indication of sale, before the transaction is completed.

23/2/77

FG

NATIONAL STANDARDS COMMISSION

NOTIFICATION OF CHANGE

CERTIFICATE OF APPROVAL No 5/6A/38

CHANGE No 1

The approval of the

"M" System Self-serve Driveway Flowmeter

given in Certificate No 5/6A/38 dated 30 June 1977

is changed by:

1. deleting: I.O.C. - Christie's Beach, Adelaide, South Australia;

   and

2. inserting: I.O.C. - Murrie's Brooklyn Park Service Station, 299 Henley Beach Road, Brooklyn Park

18/8/77

NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No 5/6A/38

VARIATION No 2

Pattern: "M" System Self-serve Driveway Flowmeter

Submittor: Production Engineering Co. Ltd,
Station Road,
Marton, New Zealand.

Dates of Approval of Variation: 9 November 1977, 7 February 1978

The modifications described in this Schedule apply to the patterns described in Certificate of Approval No 5/6A/38 dated 3 April 1973 and 30 June 1977 and Technical Schedule No 5/6A/38 - Variation No 1 dated 16 September 1976.

All instruments conforming to this approval shall be marked "NSC No 5/6A/38".

Description:

The approved modifications provide for:

1. an STM 377 automatic hose nozzle (see Figures 44 and 45). The anti-drain valve which is upstream of the main valve retains a pressure of not less than 15 kPa. A swivel hose coupling may be fitted to the nozzle;

2. an OPW 1AS automatic hose nozzle (see Figures 46 and 47). The anti-drain valve which is downstream of the main valve retains a pressure of not less than 15 kPa. A swivel hose coupling may be fitted to the nozzle.

GH

5/6A/38
18/4/88

NATIONAL STANDARDS COMMISSION

CANCELLATION CERTIFICATE OF APPROVAL No 5/6A/38

This is to certify that the approval for use for trade granted in respect of the pattern and variants of the

M System Self-serve Driveway Flowmeter

(originally approved as the Avery-Hardoll Model 4301/HR Driveway Flowmeter)

submitted by Production Engineering Co Ltd
(now known as Production Engineering (Aust) Pty Ltd)
270 Pacific Highway
Crows Nest NSW 2065

and Email Ltd
(Electronic & Petroleum Equipment Division)
Canterbury Road
Kilsyth VIC 3137

have been cancelled in respect of new instruments as from 31 March 1988.

Signed

J. Birch

Executive Director

FIGURE 5/6A/38 - 1

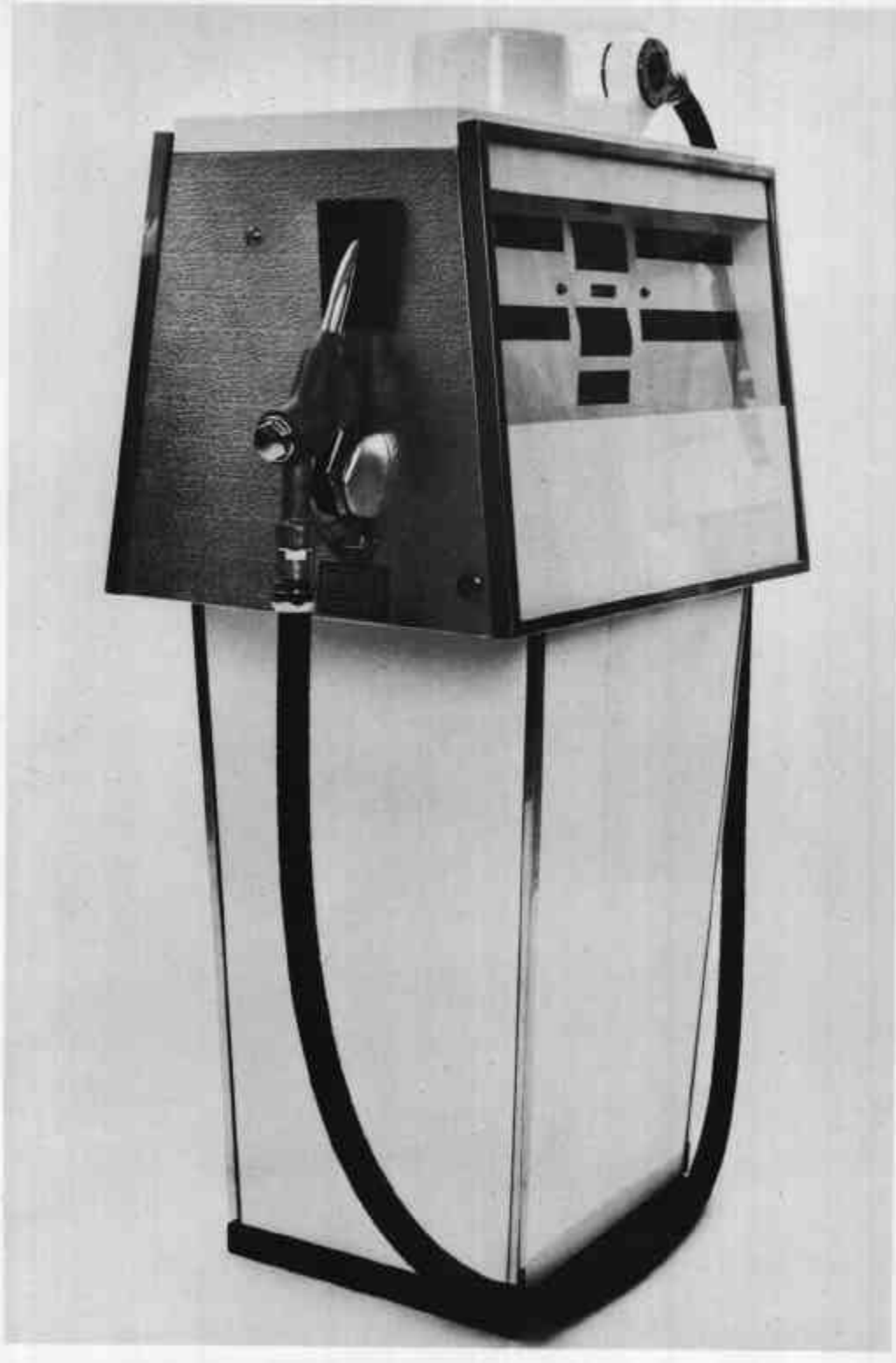
1	2	3	4	5	6	7	8	9	10	11	12
				VARIANTS							
	COMPONENTS	DATE APPROVED	FOOTNOTES	PATTERN 4301/HR	4301/HR	4320/HR	4301D/HR	4301/E	4320/E	4301D/E	M-SYSTEM
1	Pump, positive displacement	29 MAR 72		*	*	*	*	*	*	*	*
2	Gas separator, AH PP11	29 MAR 72		*	*		*	*		*	*
3	Gas separator, AH PP11X	29 MAR 72				*			*		
4	Gas separator test valve	29 MAR 72		*	*	*	*	*	*	*	*
5	Meter, AH PM400	29 MAR 72		*	*	*	*	*	*	*	*
6	Solenoid valve O1250	29 MAR 72		*	*	*	*	*	*	*	*
7	Computer VR 1613, litres	29 MAR 72		*	A	A	A	A	A	A	A
8	Computer VR 1613, gallons	29 MAR 72			A	A	A	A	A	A	A
9	Computer VR 101, litres	29 MAR 72			A	A	A	A	A	A	A
10	Computer VR 101, gallons	29 MAR 72			A	A	A	A	A	A	A
11	Computer reset mechanism	29 MAR 72		*	*	*	*	*	*	*	*
12	Sight glass AHQ70A	29 MAR 72		*	*	*	*				*
13	Sight glass AHQ80	29 MAR 72						*	*	*	
14	Back-pressure valve AHQ73	29 MAR 72						*	*	*	
15	Hose, external $\frac{3}{4}$-inch bore	29 MAR 72		*	*	*	*				*
16	Hose, external retractable $\frac{3}{4}$-inch bore	29 MAR 72						*	*	*	
17	Swivel hose coupling	29 MAR 72		*	‡	‡	‡	‡	‡	‡	‡
18	Final filter	29 MAR 72		*	‡	‡	‡	‡	‡	‡	‡
19	Nozzle, PP10C	29 MAR 72		*	B	B	B	B	B	B	B
20	Nozzle, AHQ77	29 MAR 72			B	B	B	B	B	B	B
21	Pump interlock	29 MAR 72		*	*	*	*	*	*	*	*
22	Dial face, single, litres	29 MAR 72		*	C	C		C	C		C
23	Dial face, single, gallons	29 MAR 72			C	C		C	C		C
24	Dial face, dual, litres	29 MAR 72					D			D	
25	Dial face, dual, gallons	29 MAR 72					D			D	
26	Nameplate, "approved for petroleum ≤ 1 mm^2/s"	29 MAR 72		*	*	*	*	*	*	*	*
27	Driveway flowmeter number, 100 mm	29 MAR 72									*
28	Pulse-transmitter unit	29 MAR 72									E
29	Pulse-transmitter unit, similar encoders	29 MAR 72									E
30	Flowmeter module	29 MAR 72									*
31	Control unit	29 MAR 72									*
32	Printer, Friden 147 or 1150/51	29 MAR 72									*

* - indicates required component
A - *indicates alternative components, one of which is required*
B to E - as for A
‡ - optional component

Compatibility Table for Components Described in this Certificate

12/4/72

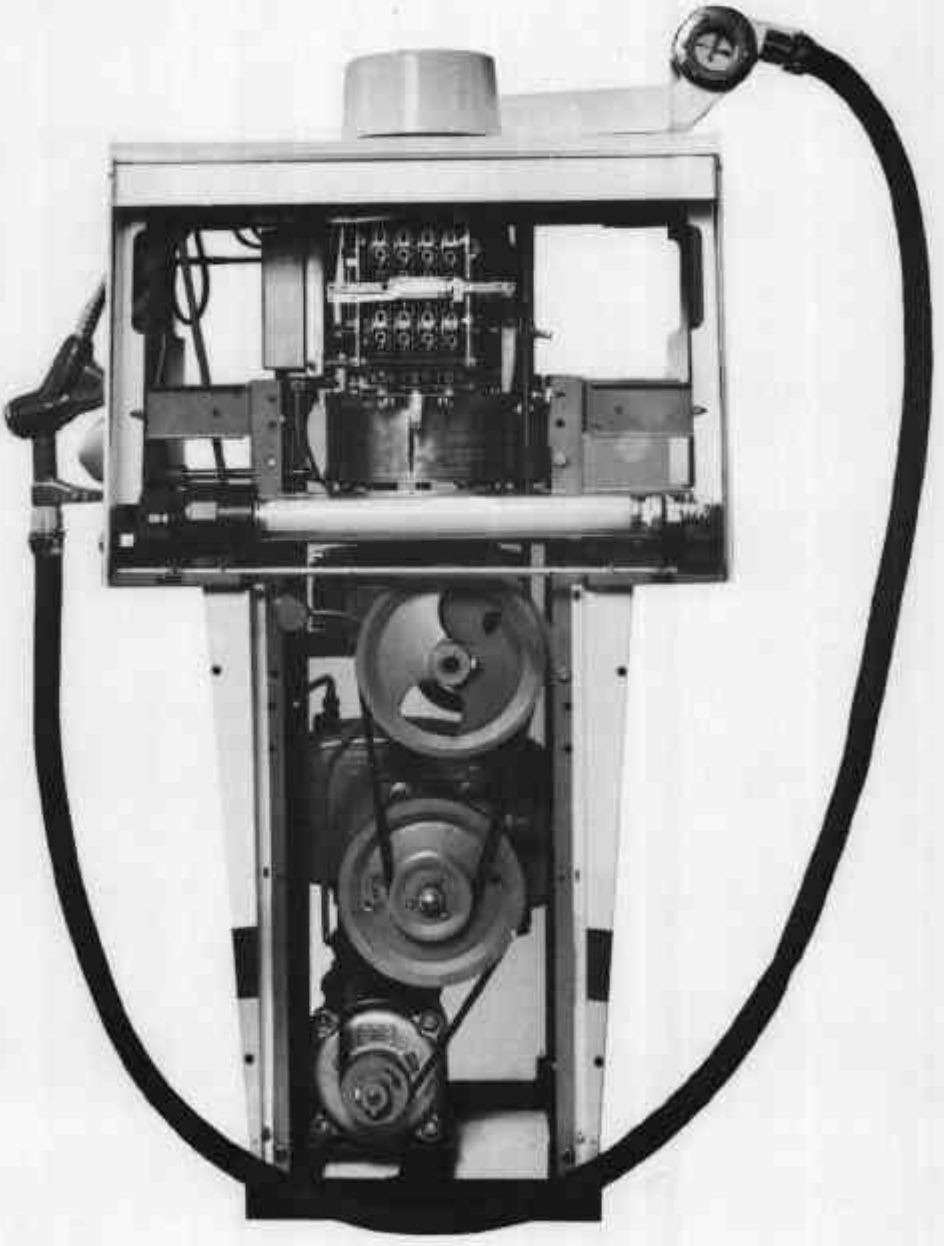
FIGURE 5/6A/38 - 2



Avery-Hardoll 4301/HR

12/4/72

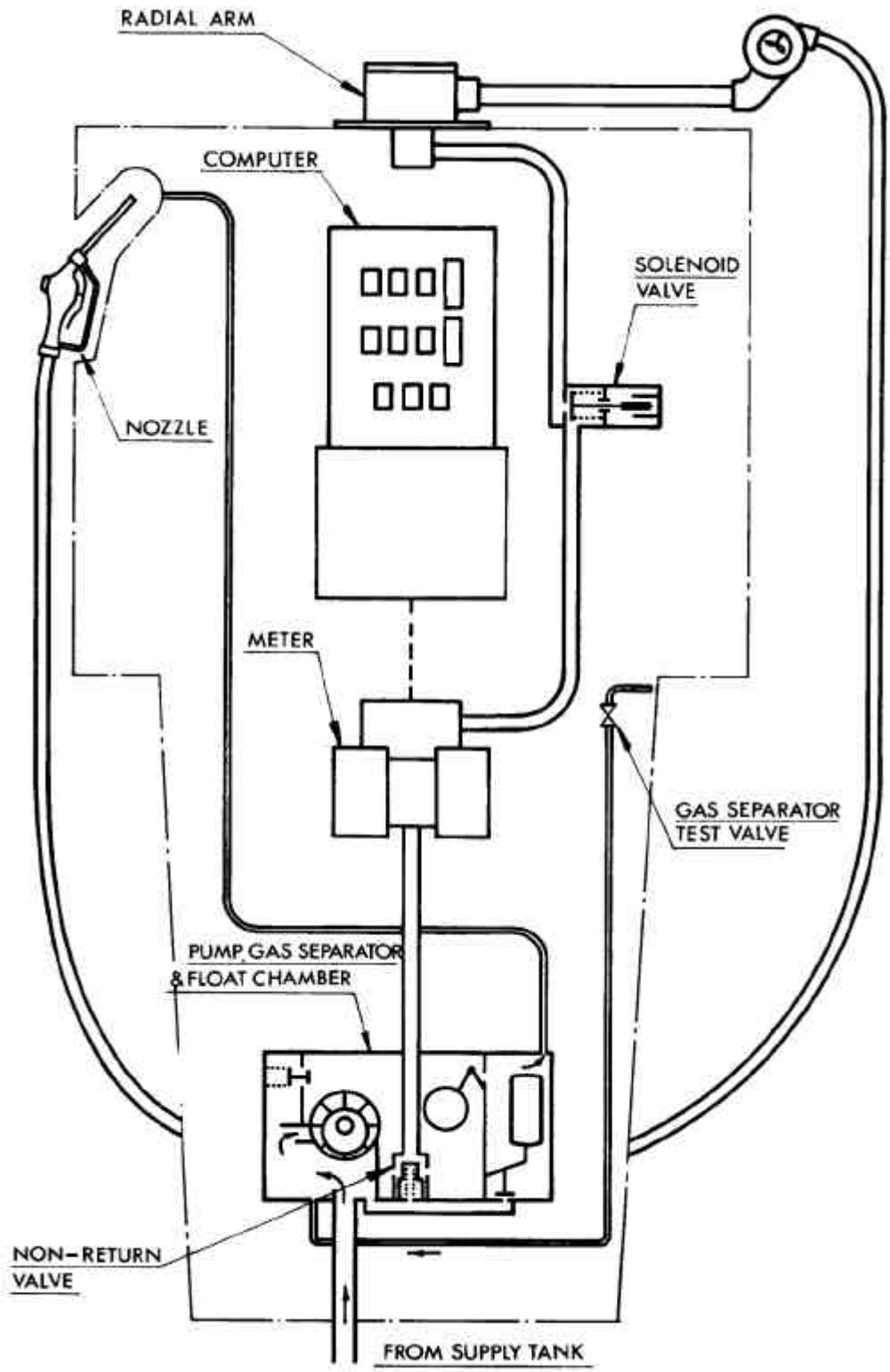
FIGURE 5/6A/38 - 3



Avery-Hardoll 4301/HR

3/4/73

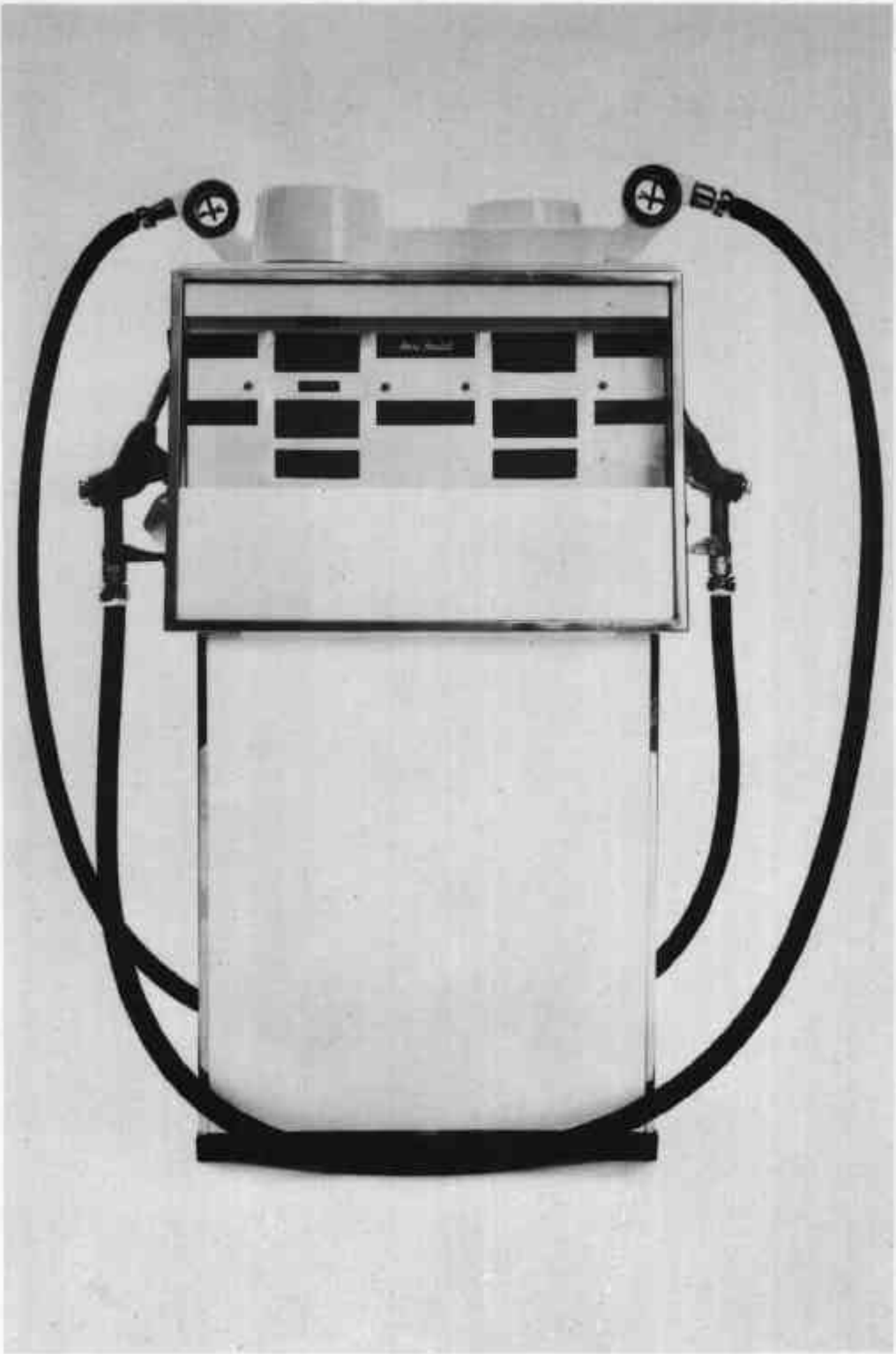
FIGURE 5/6A/38 - 4



Avery-Hardoll 4301/HR — Hydraulic Diagram

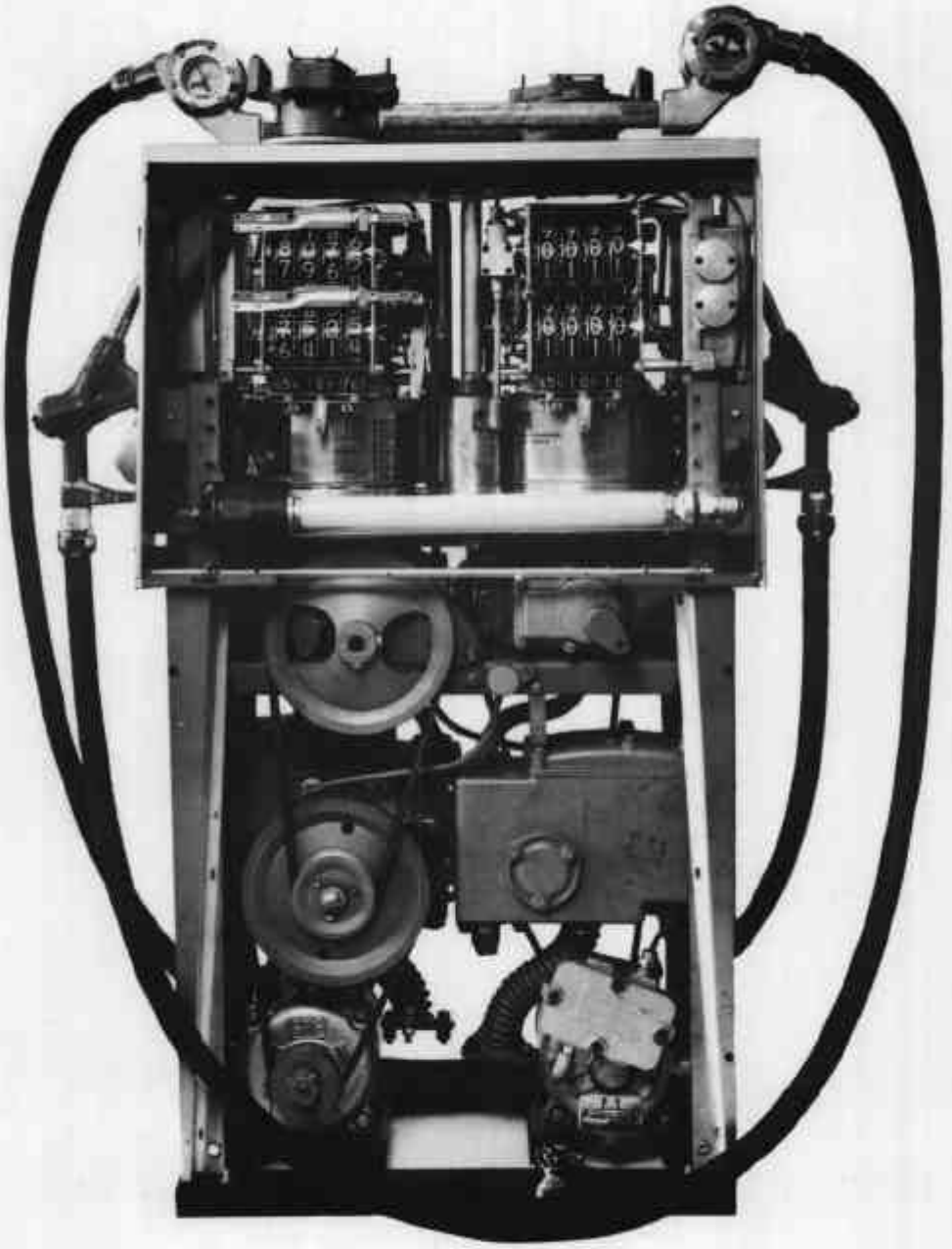
12/4/72

FIGURE 5/6A/38 - 5



Avery-Hardoll 4301D/HR

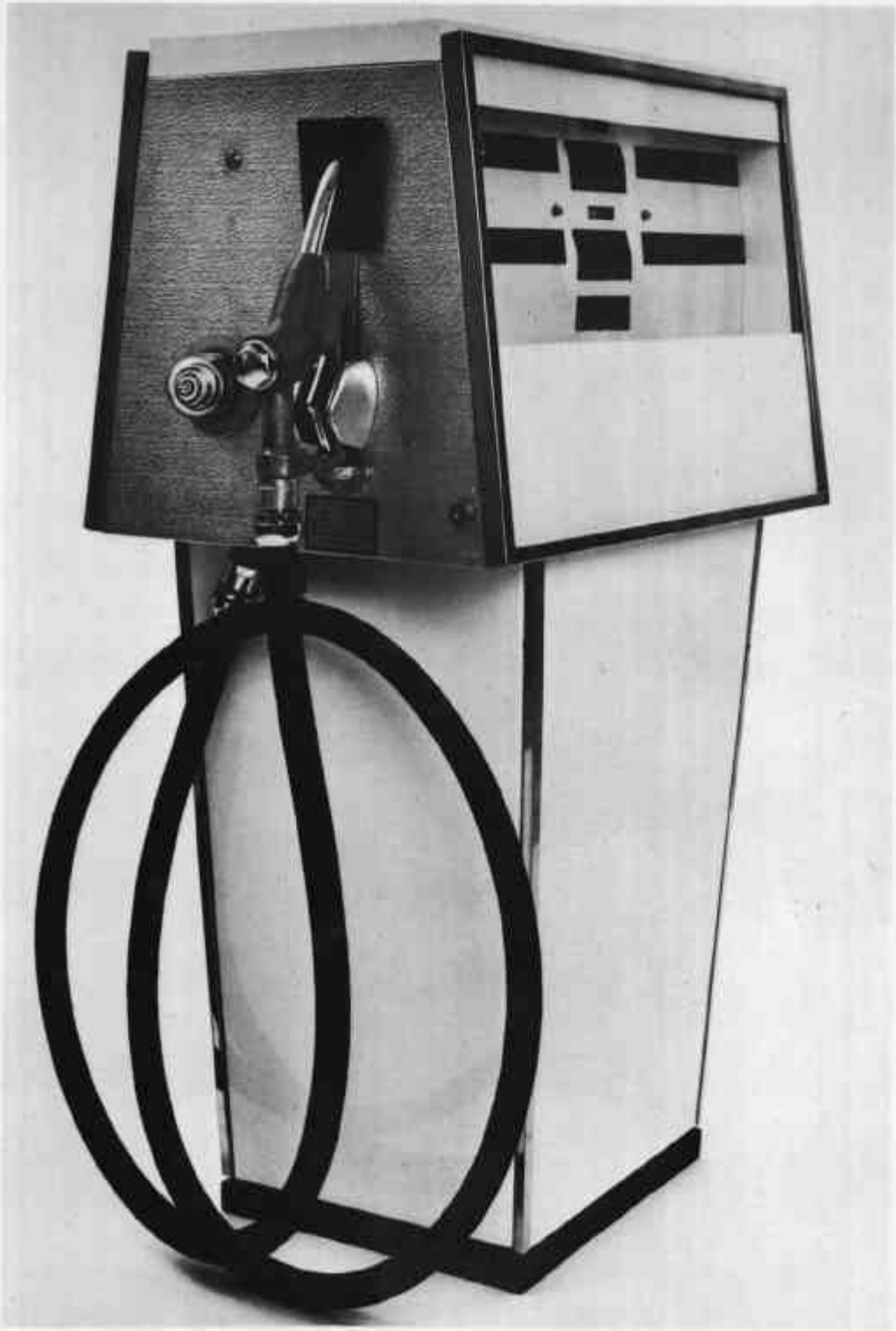
FIGURE 5/6A/38 - 6



Avery-Hardoll 4301D/HR

3/4/73

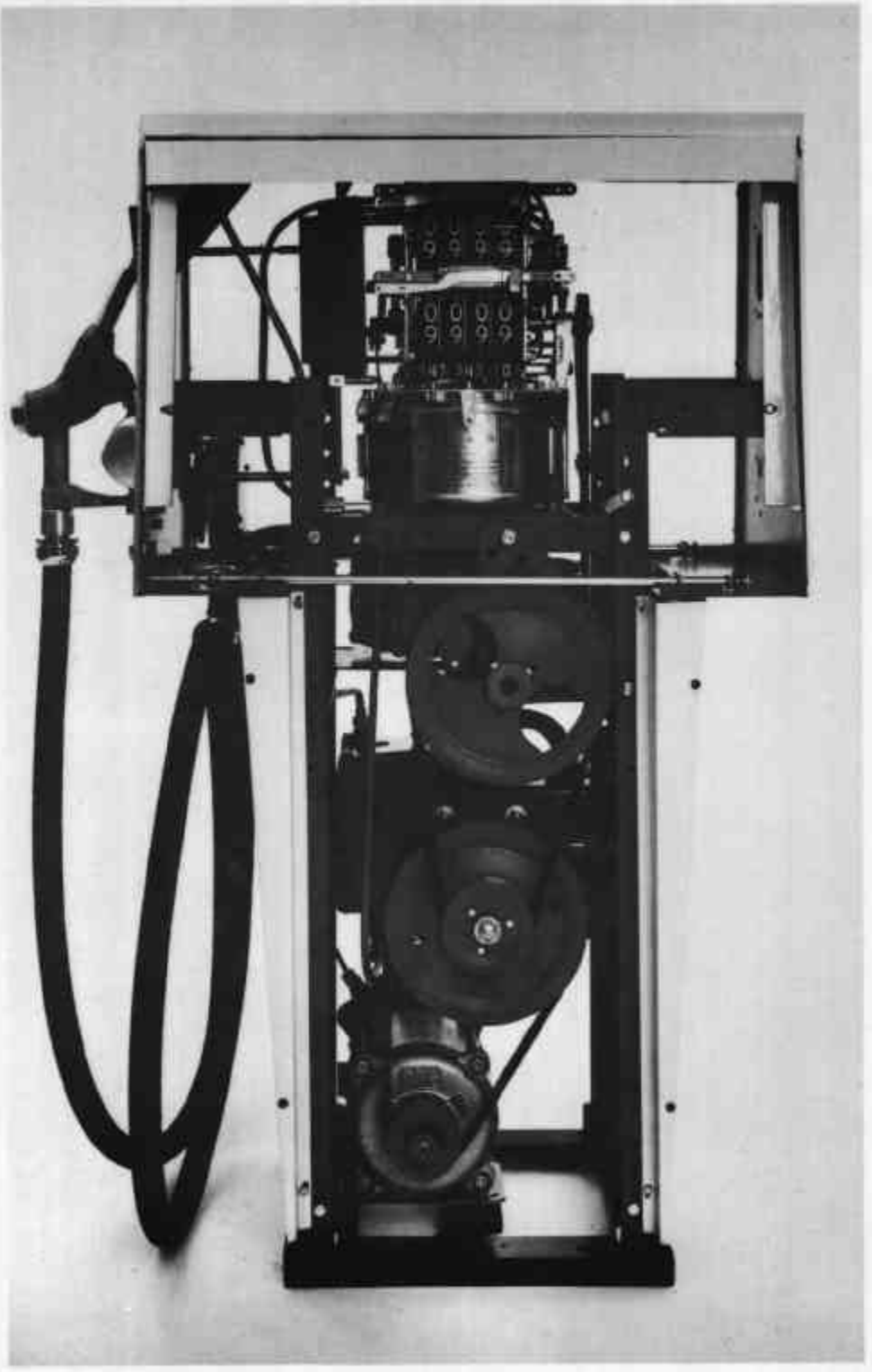
FIGURE 5/6A/38 - 7



Avery-Hardoll 4301/E

12/4/72

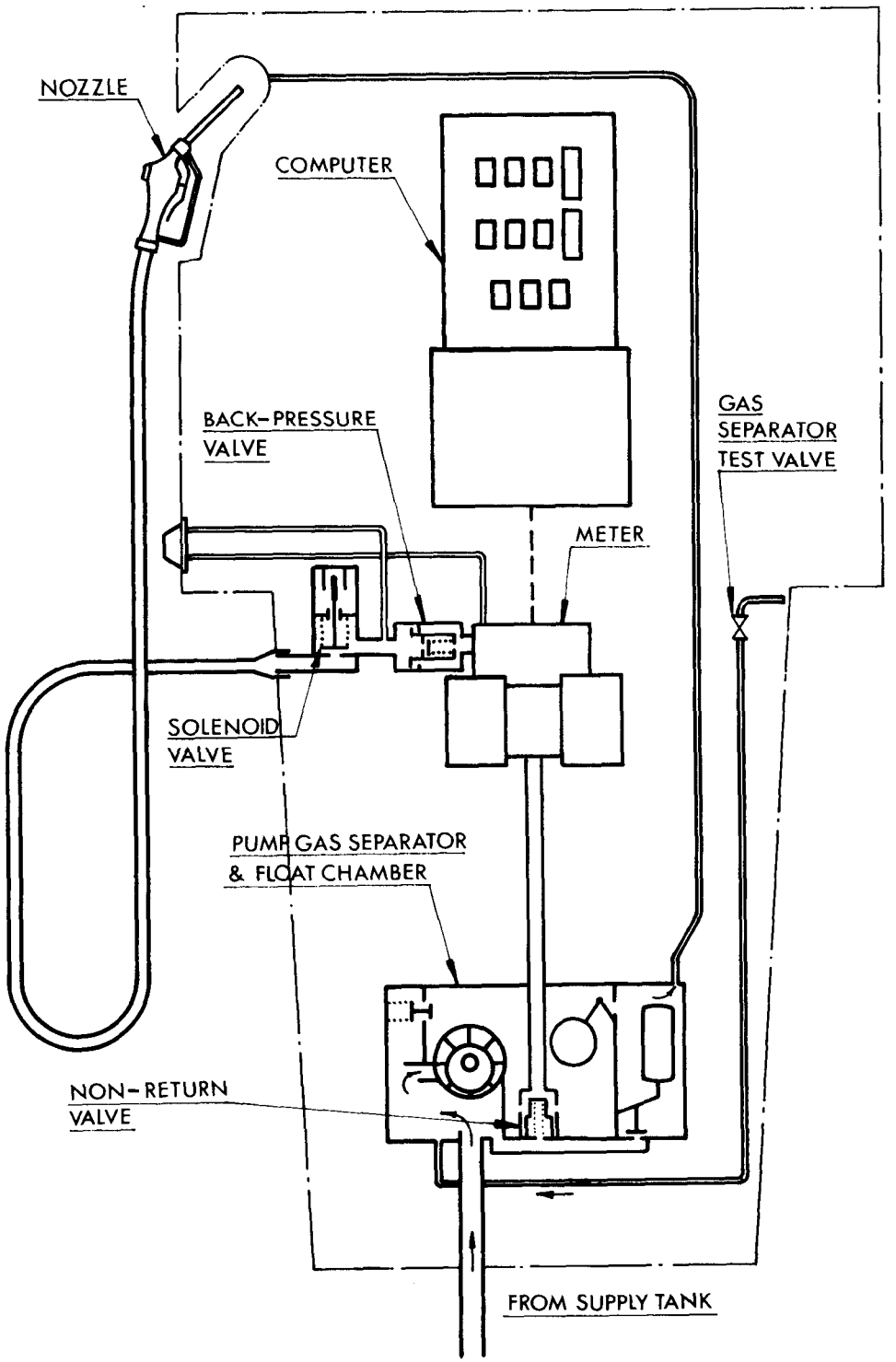
FIGURE 5/6A/38 - 8



Avery-Hardoll 4301/E

12/4/72

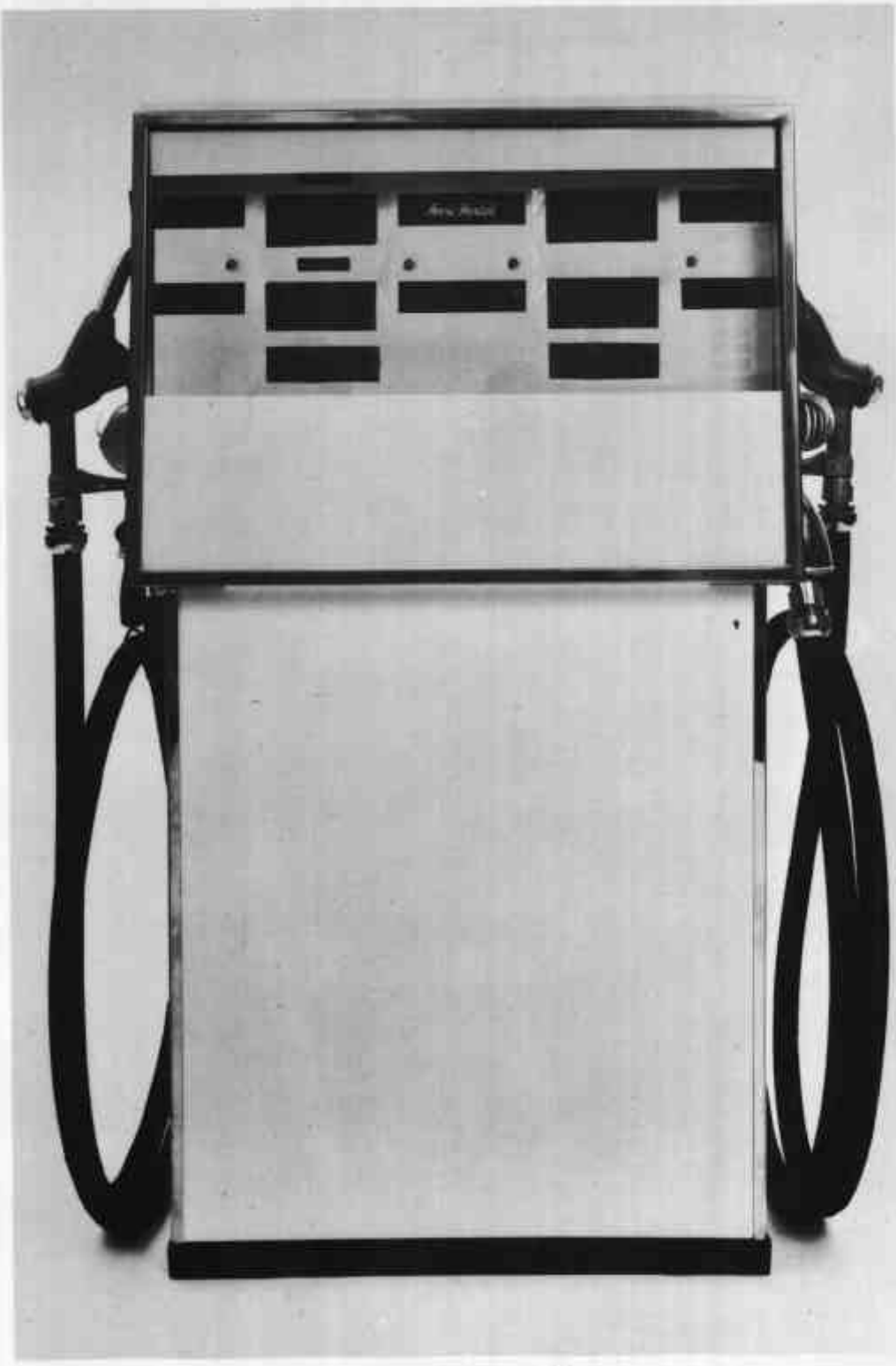
FIGURE 5/6A/38 - 9



Avery-Hardoll 4301/E — Hydraulic Diagram

12/4/72

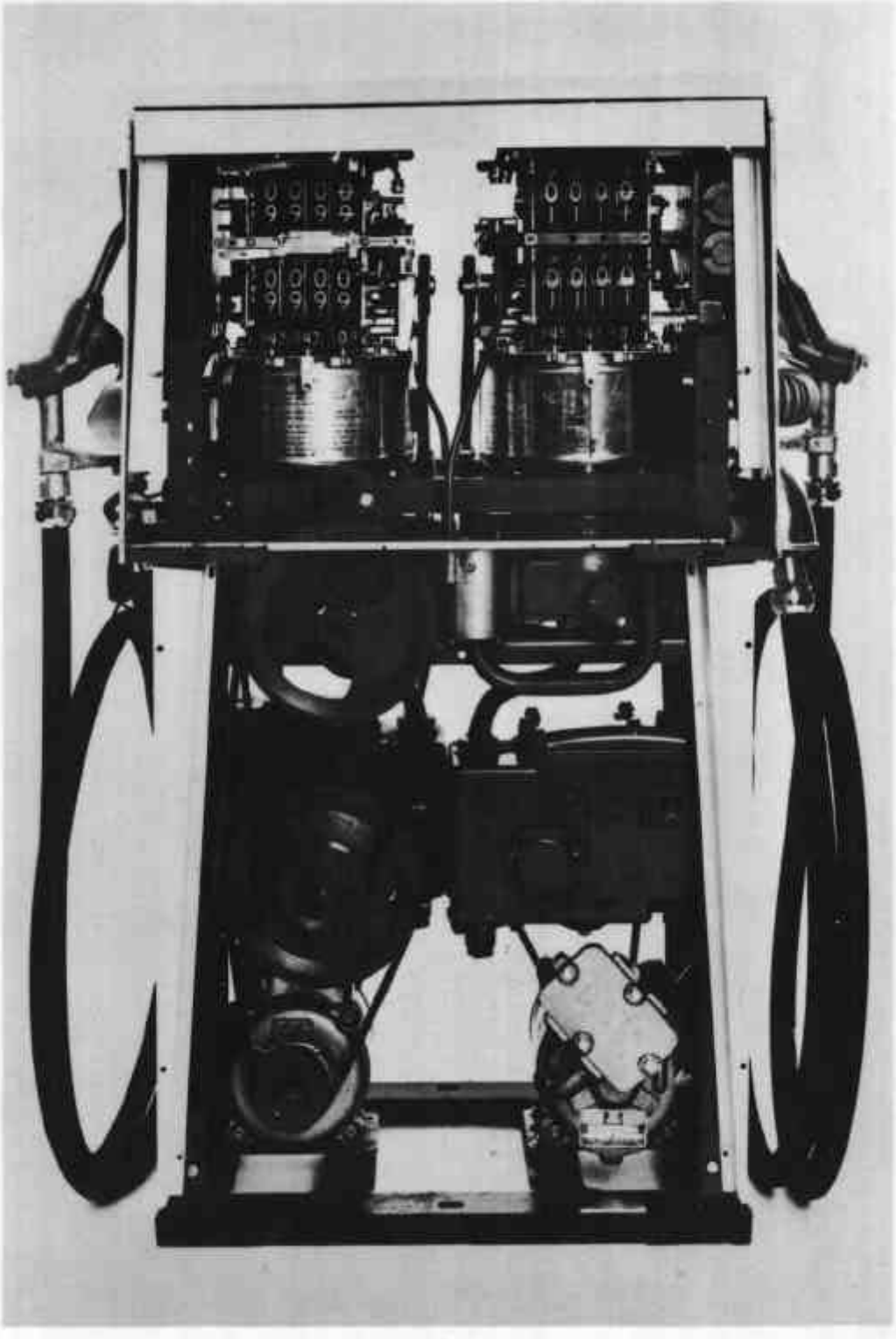
FIGURE 5/6A/38 - 10



Avery-Hardoll 4301D/E

12/4/72

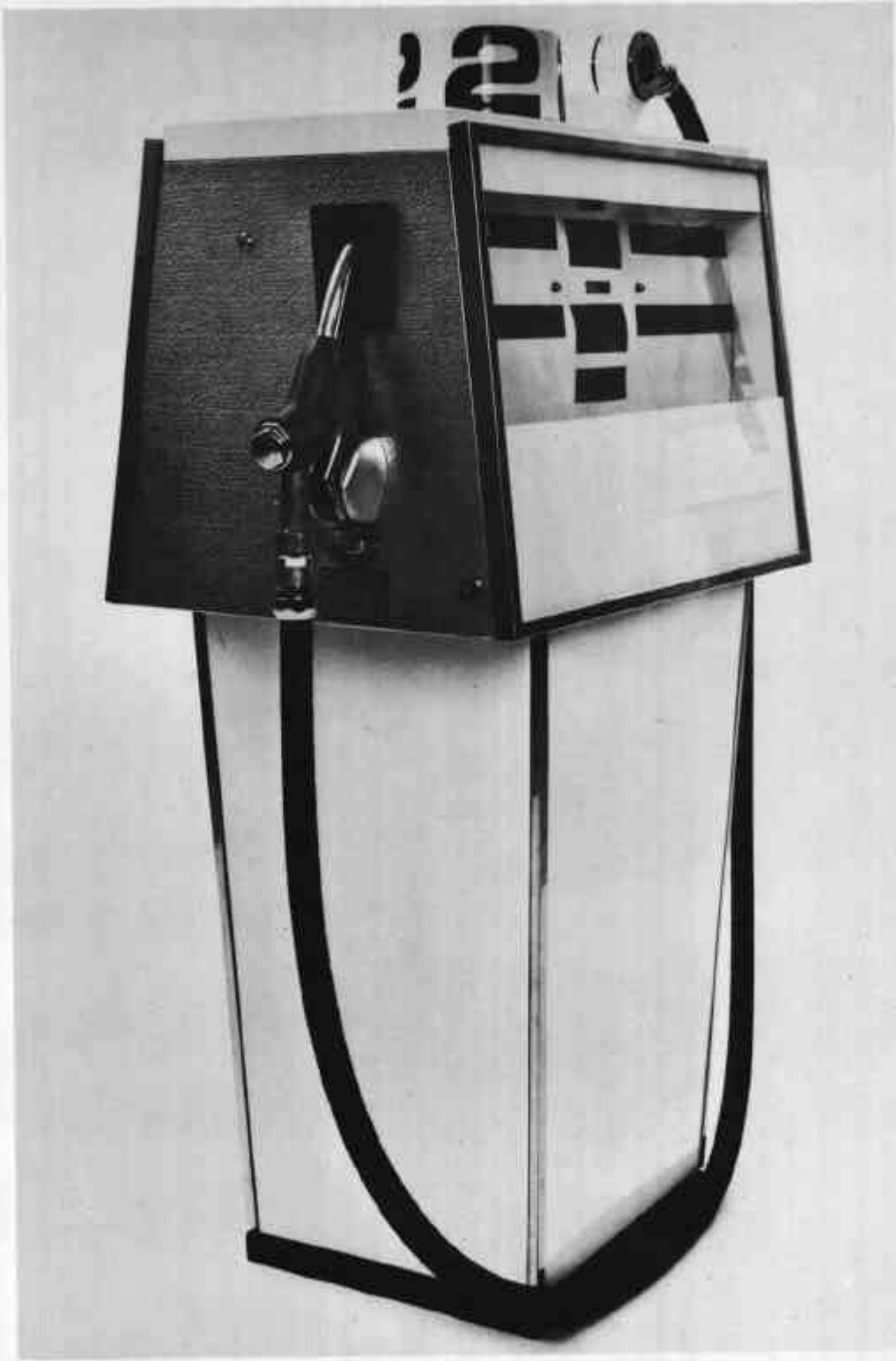
FIGURE 5/6A/38 - 11



Avery-Hardoll 4301D/E

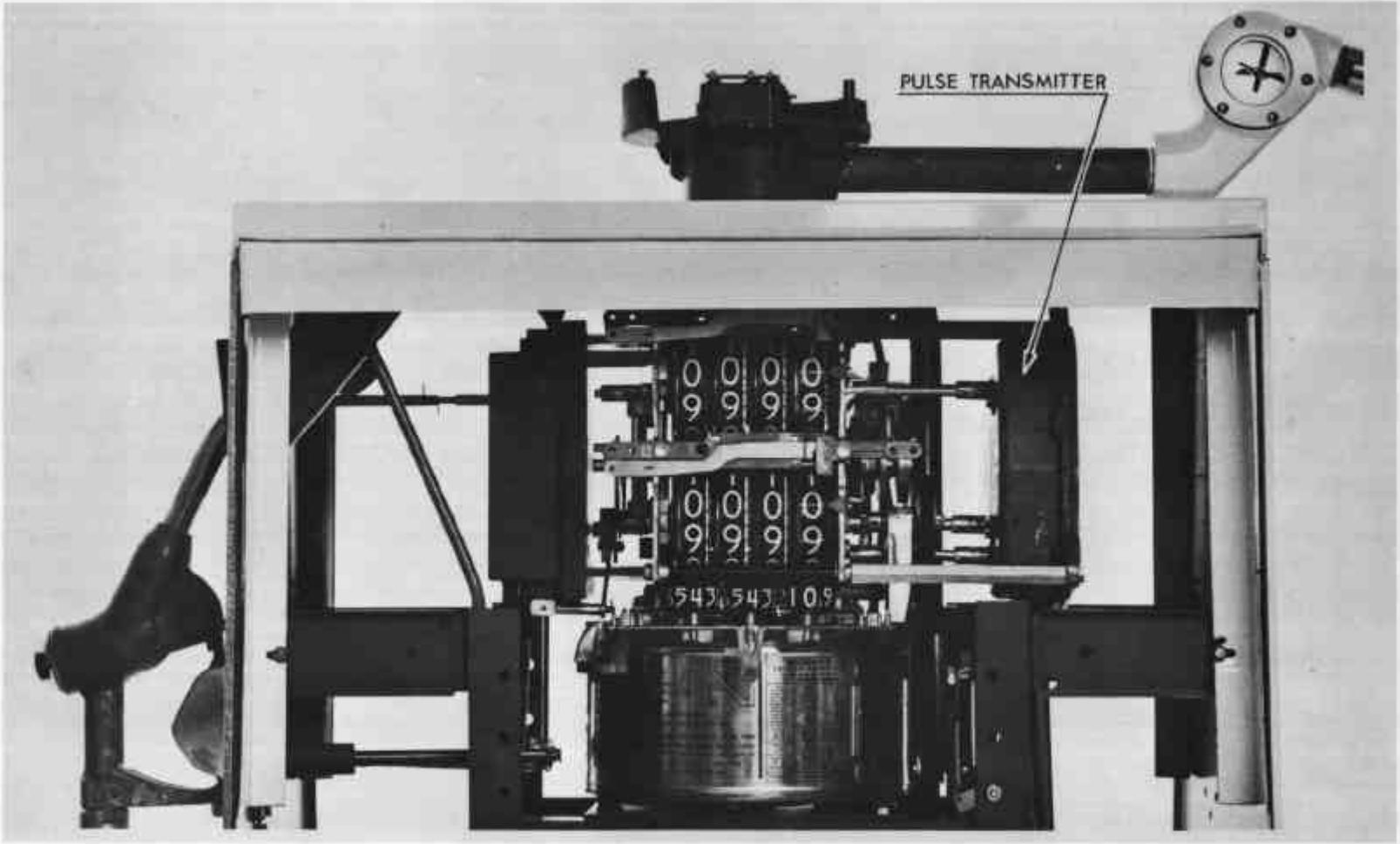
12/4/72

FIGURE 5/6A/38 - 12



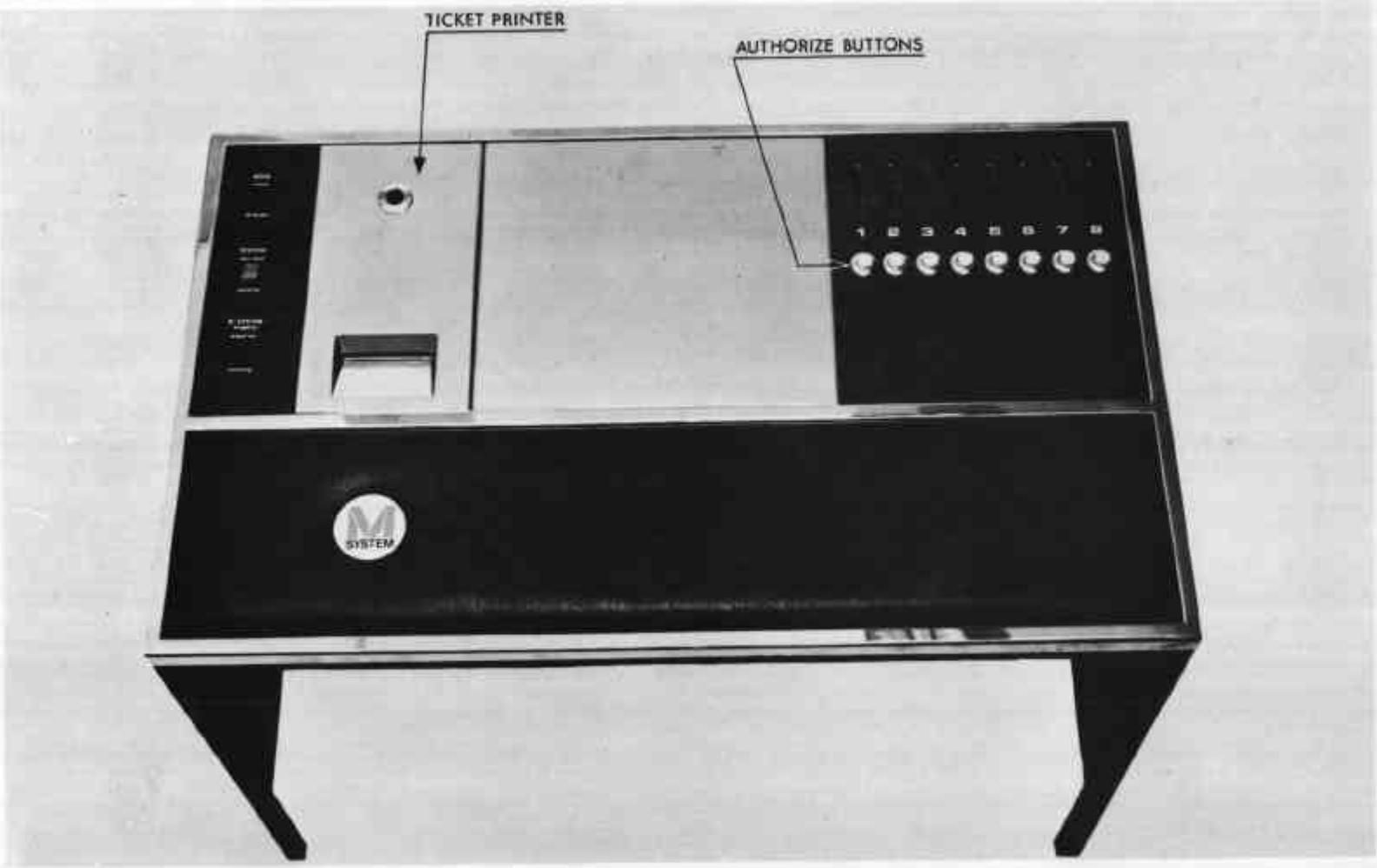
Production Engineering M-System Driveway Flowmeter
12/4/72

FIGURE 5/6A/38 - 13

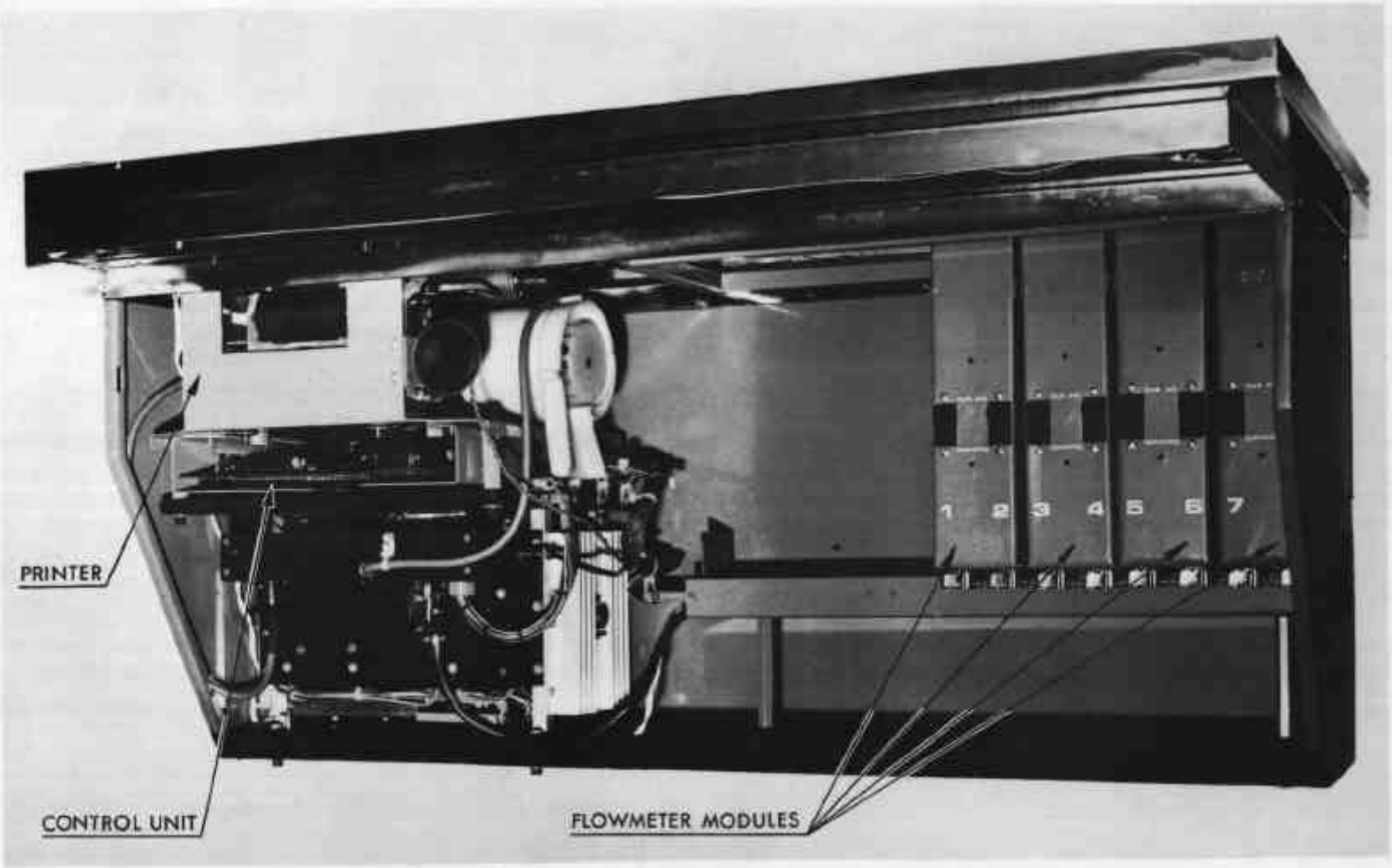


M-System Driveway Flowmeter

FIGURE 5/6A/38 - 14

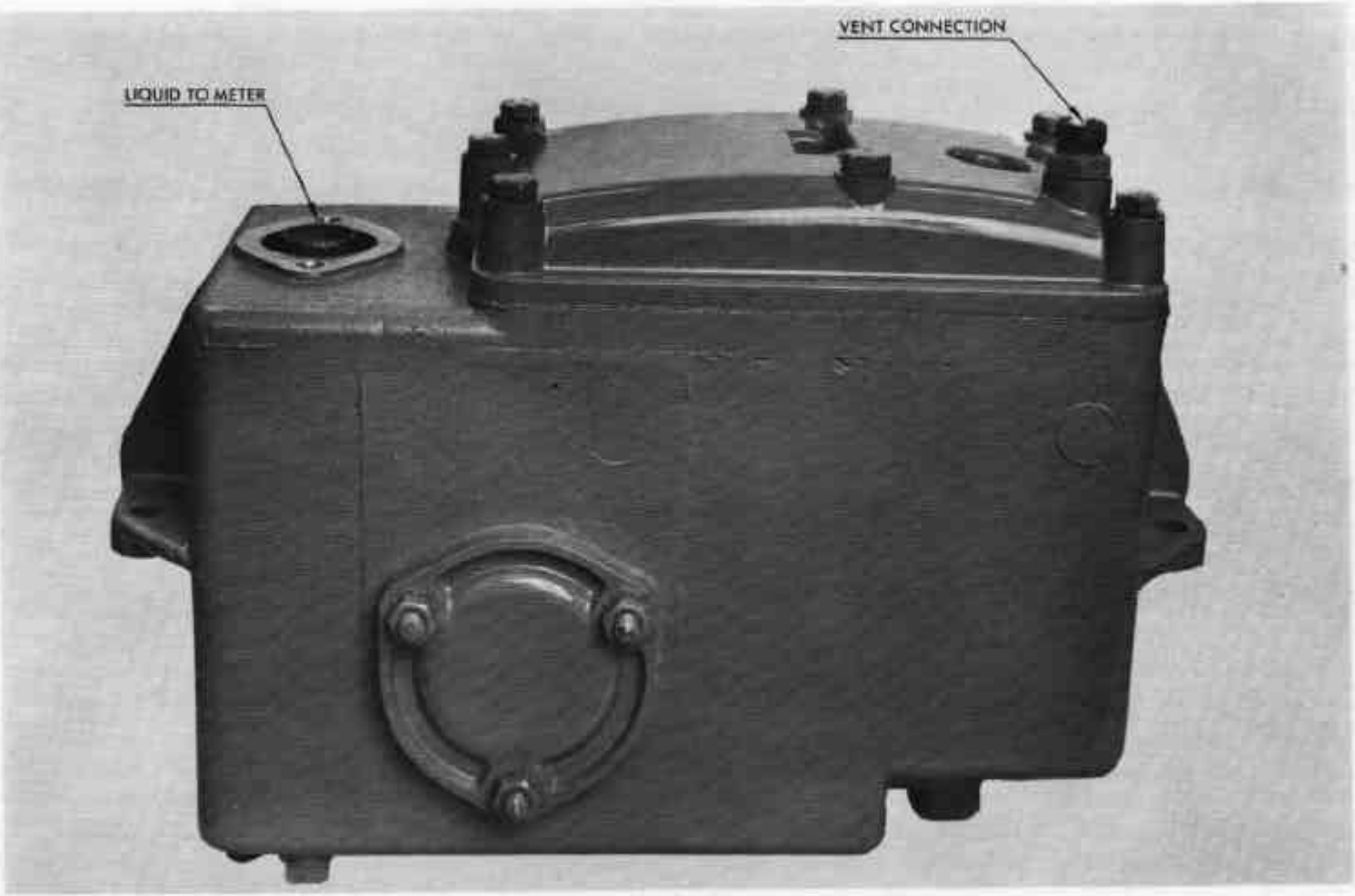


M-System Console



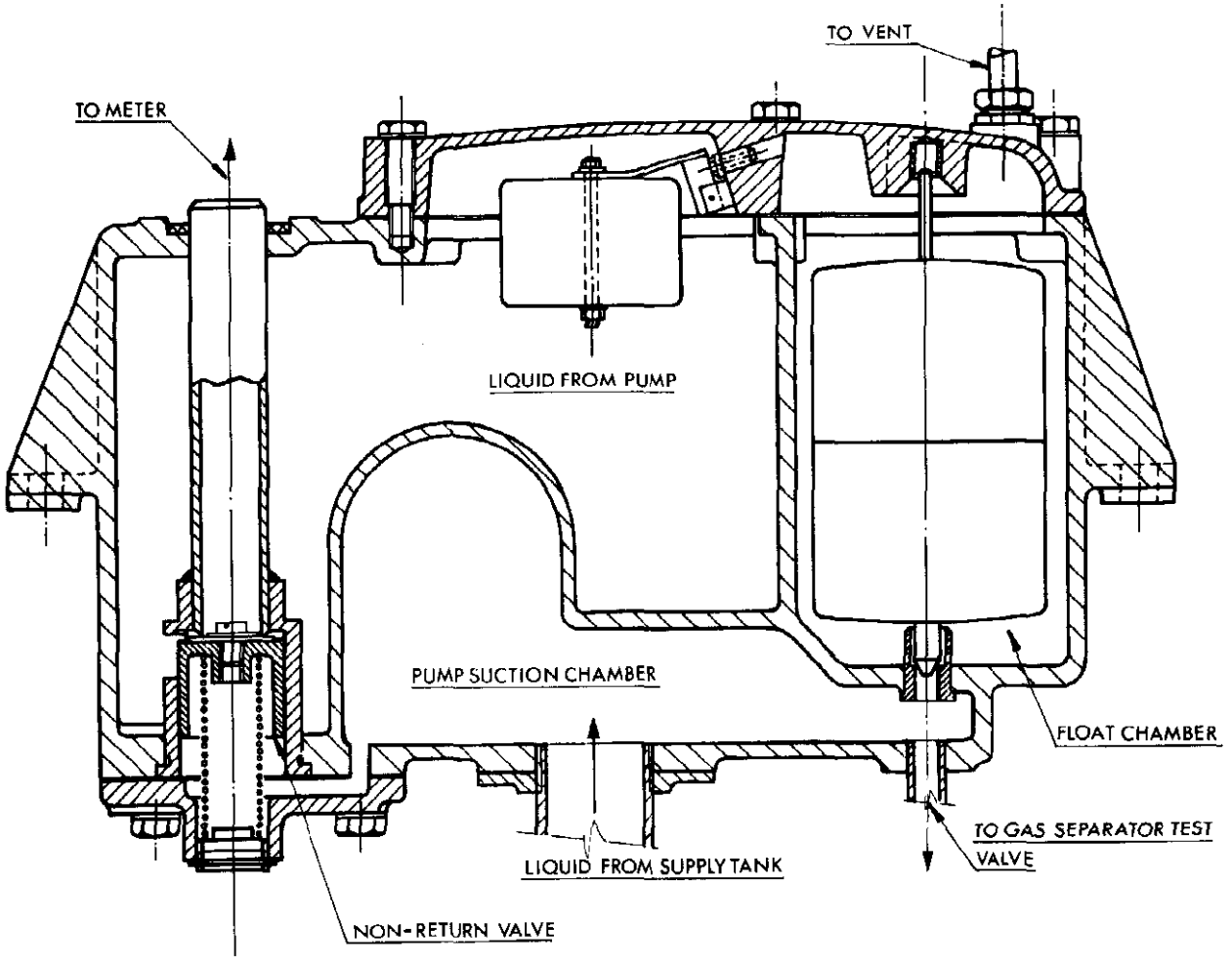
M-System Console — Front View (cover removed)

FIGURE 5/6A/38 - 16



Avery-Hardoll PP11 Gas Separator

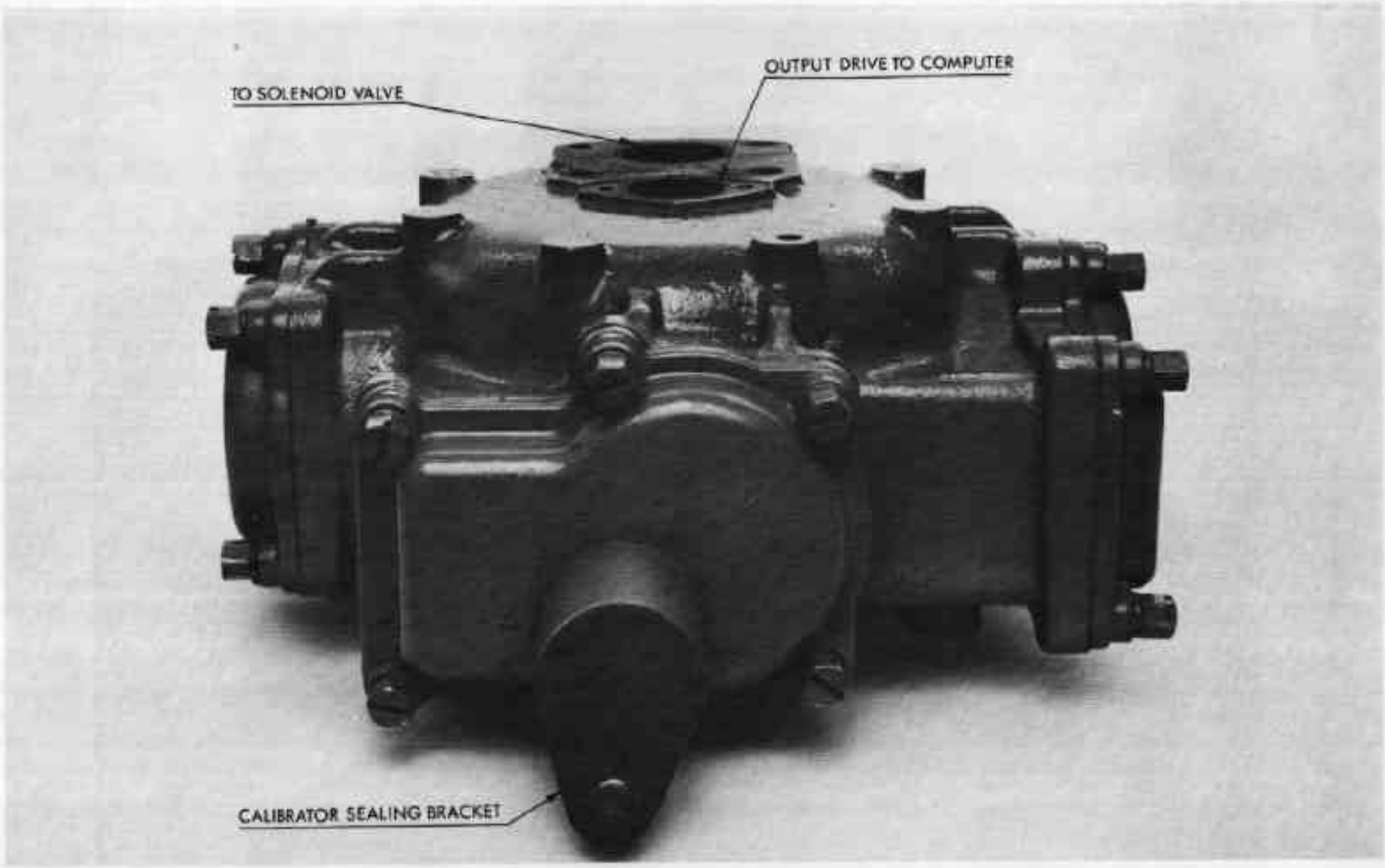
FIGURE 5/6A/38 - 17



Avery-Hardoll PP11 Gas Separator with Integral Float Chamber and Non-return Valve — Schematic Drawing

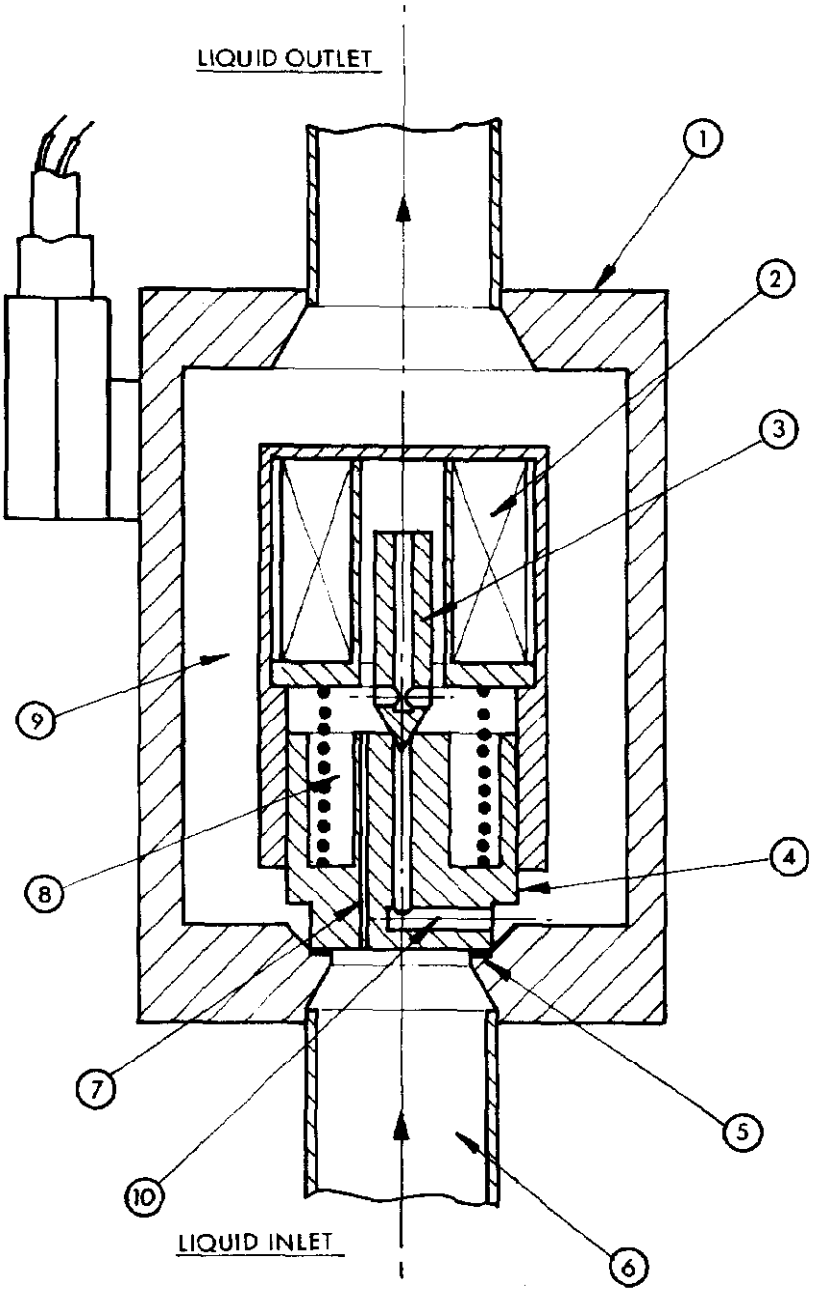
FIGURE 5/6A/38 - 18

12/4/72



Avery-Hardoll PM400 Meter

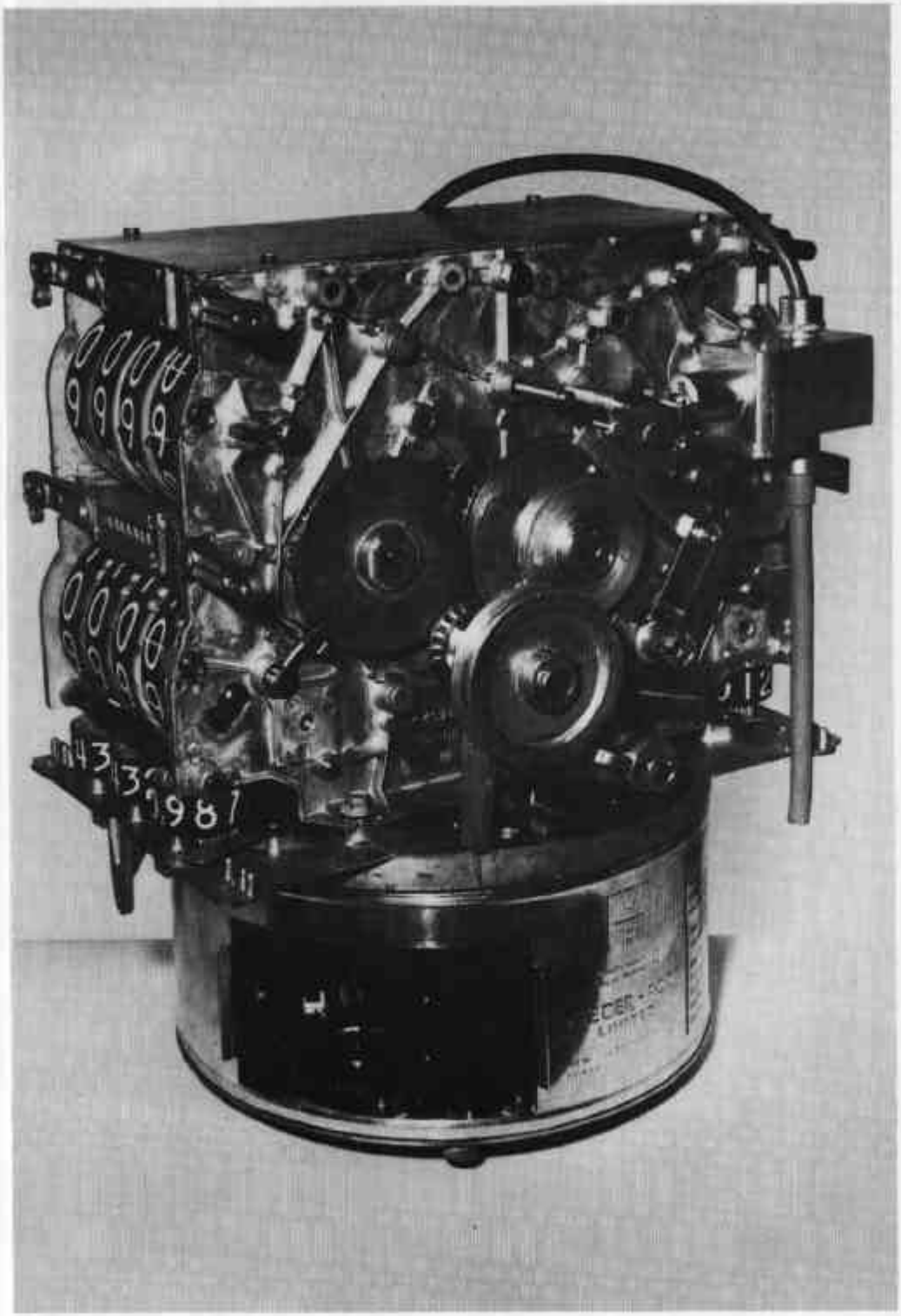
FIGURE 5/6A/38 - 19



Production Engineering 01250 Solenoid Valve —
Schematic Drawing

12/4/72

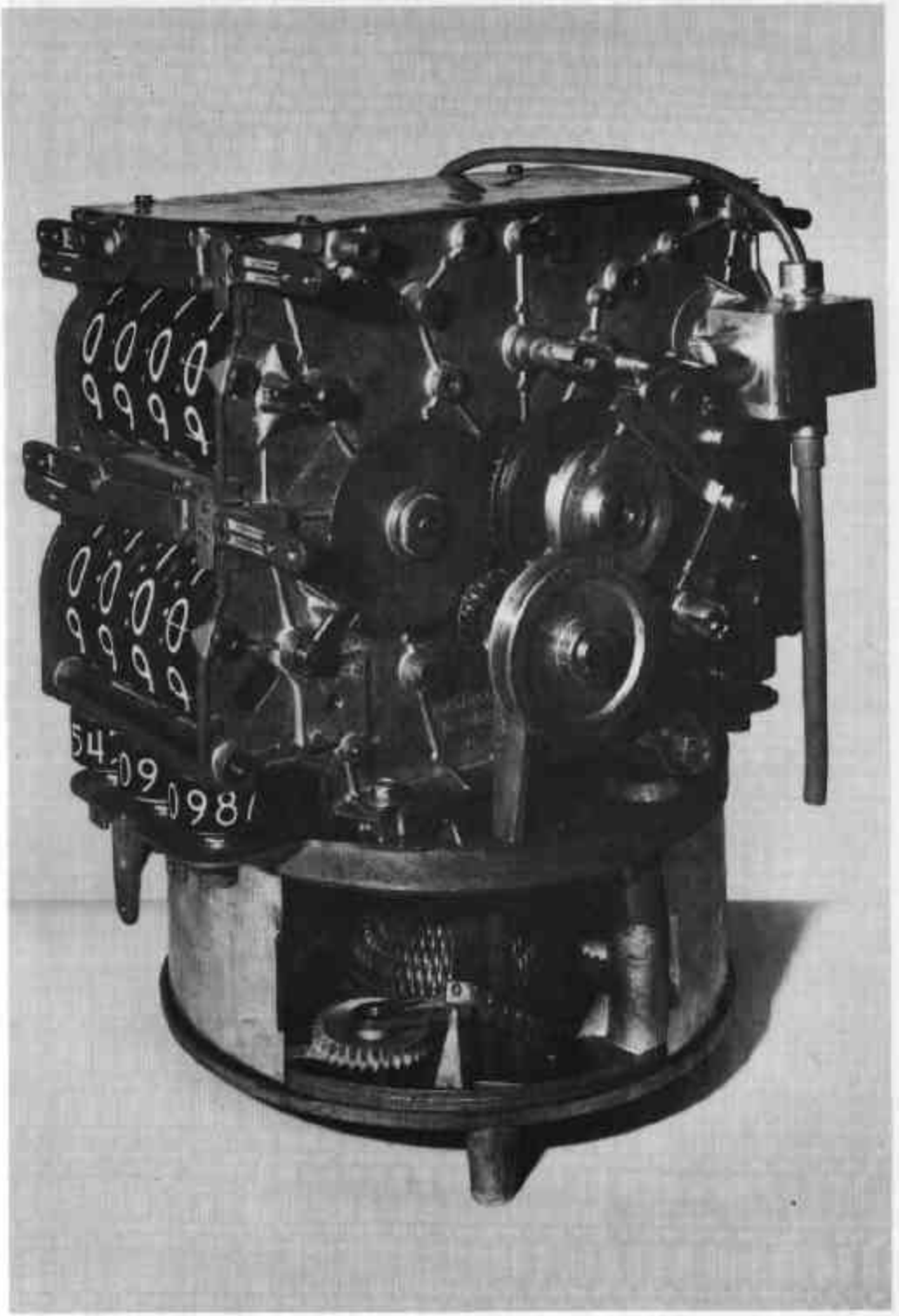
FIGURE 5/6A/38 - 20



VR1613 Computer with Automatic Reset

12/4/72

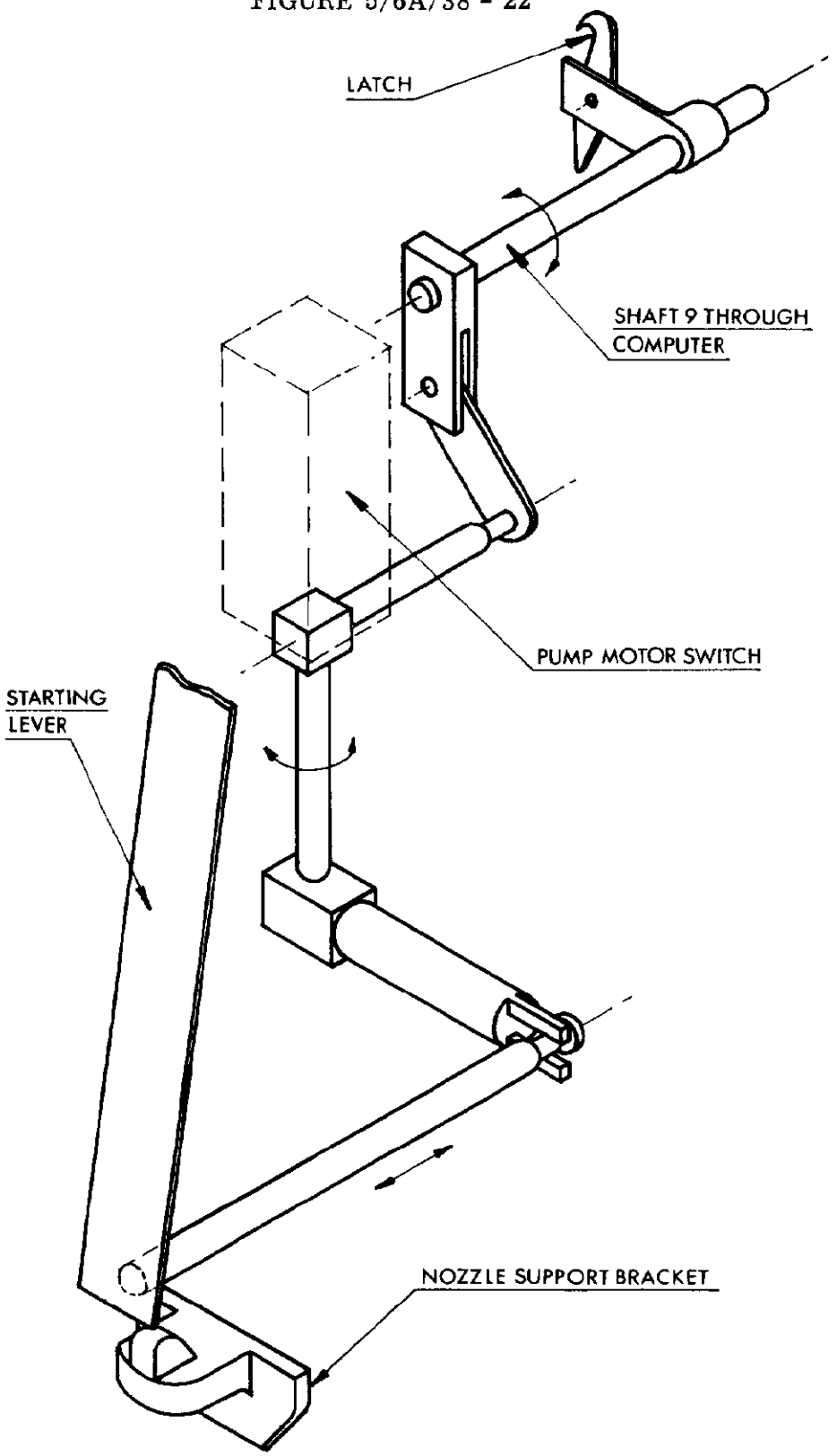
FIGURE 5/6A/38 - 21



VR101 Computer With Automatic Reset

12/4/72

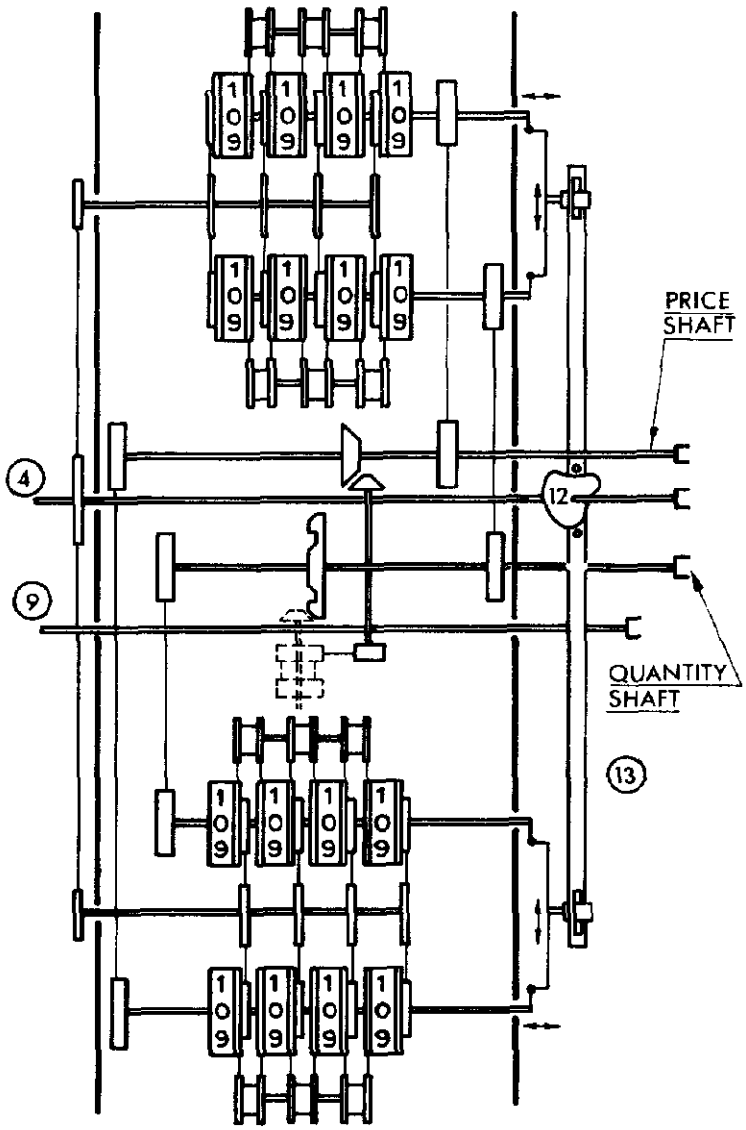
FIGURE 5/6A/38 - 22



Nozzle Hang-up and Reset Linkage

12/4/72

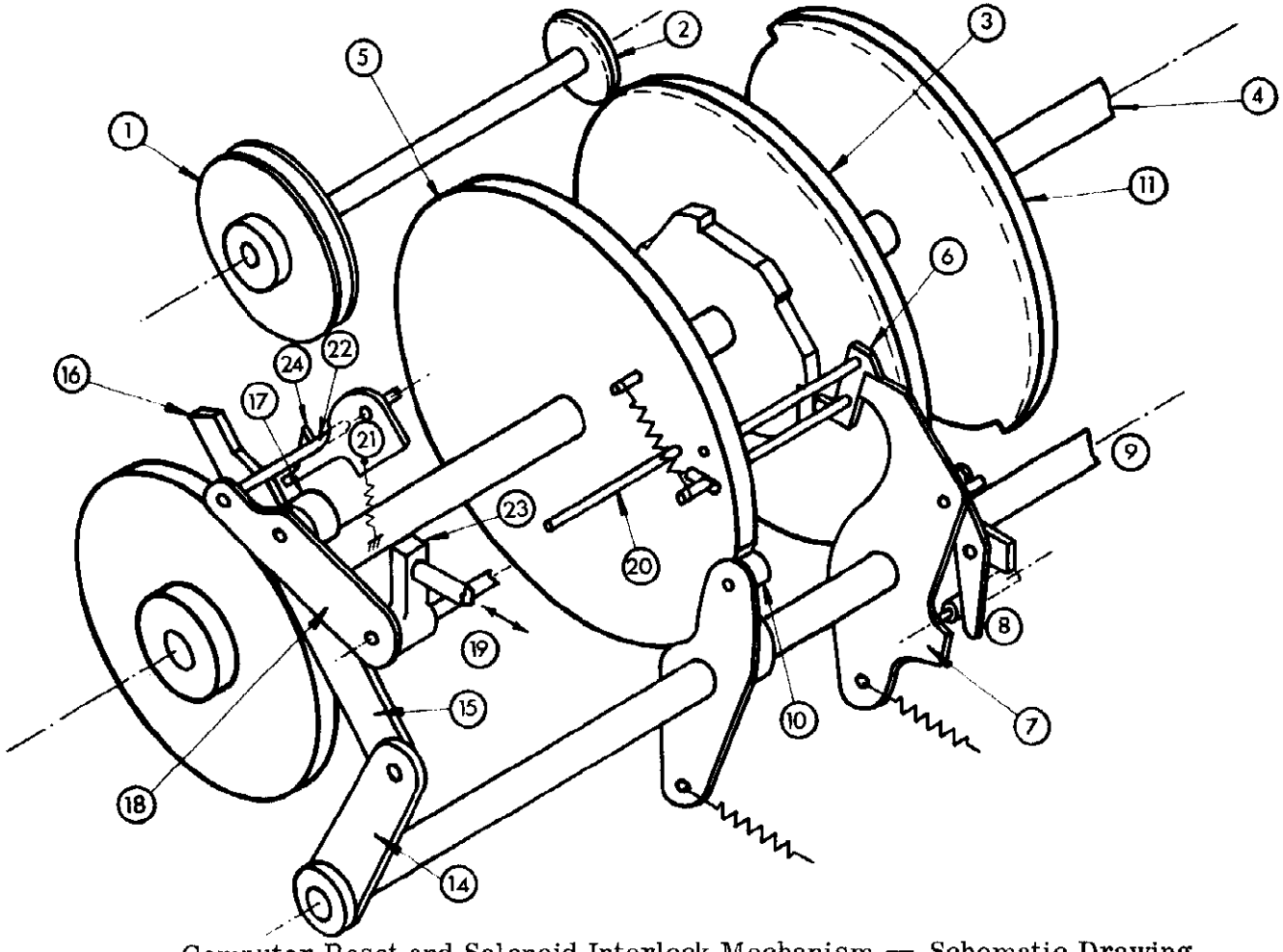
FIGURE 5/6A/38 - 23



Veeder-Root Computer Counter Section —
Schematic Drawing

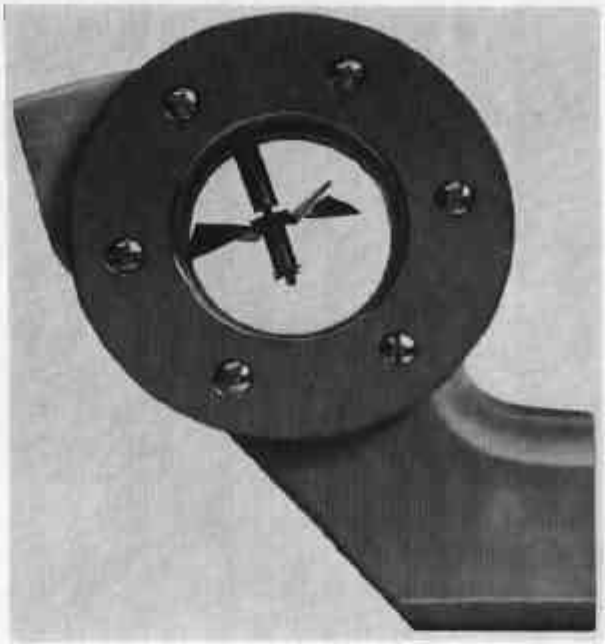
12/4/72

FIGURE 5/6A/38 - 24

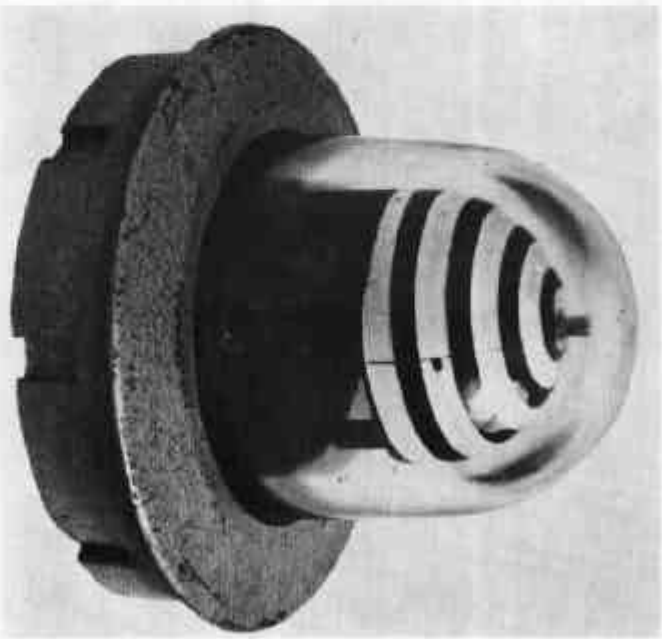


Computer Reset and Solenoid Interlock Mechanism — Schematic Drawing

FIGURE 5/6A/38 - 25



AHQ70A



AHQ 80

Avery-Hardoll Sight Glasses

12/4/72

FIGURE 5/6A/38 - 26

12/4/72

Avery-Hardoll AHQ73 Back-pressure Valve

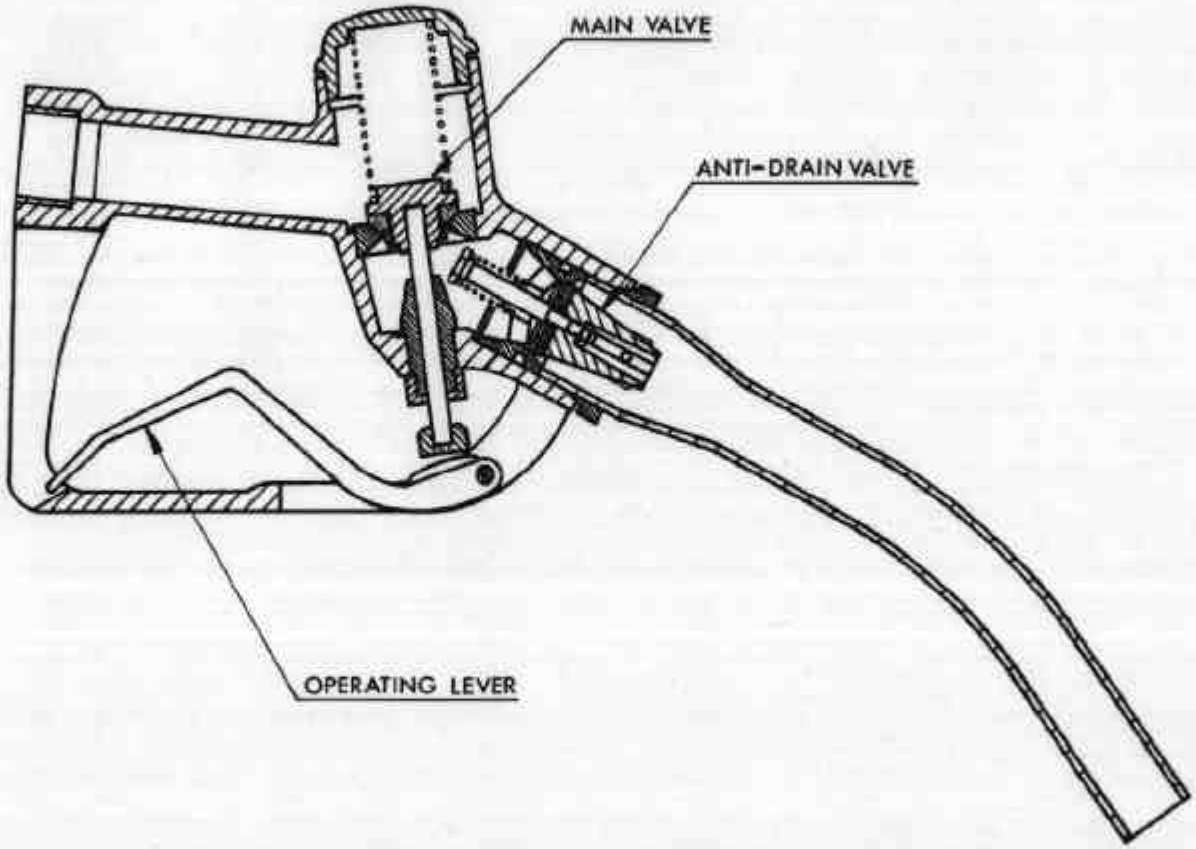
FIGURE 5/6A/38 - 27

12/4/72

Avery-Hardoll PP10C Hose Nozzle

FIGURE 5/6A/38 - 28

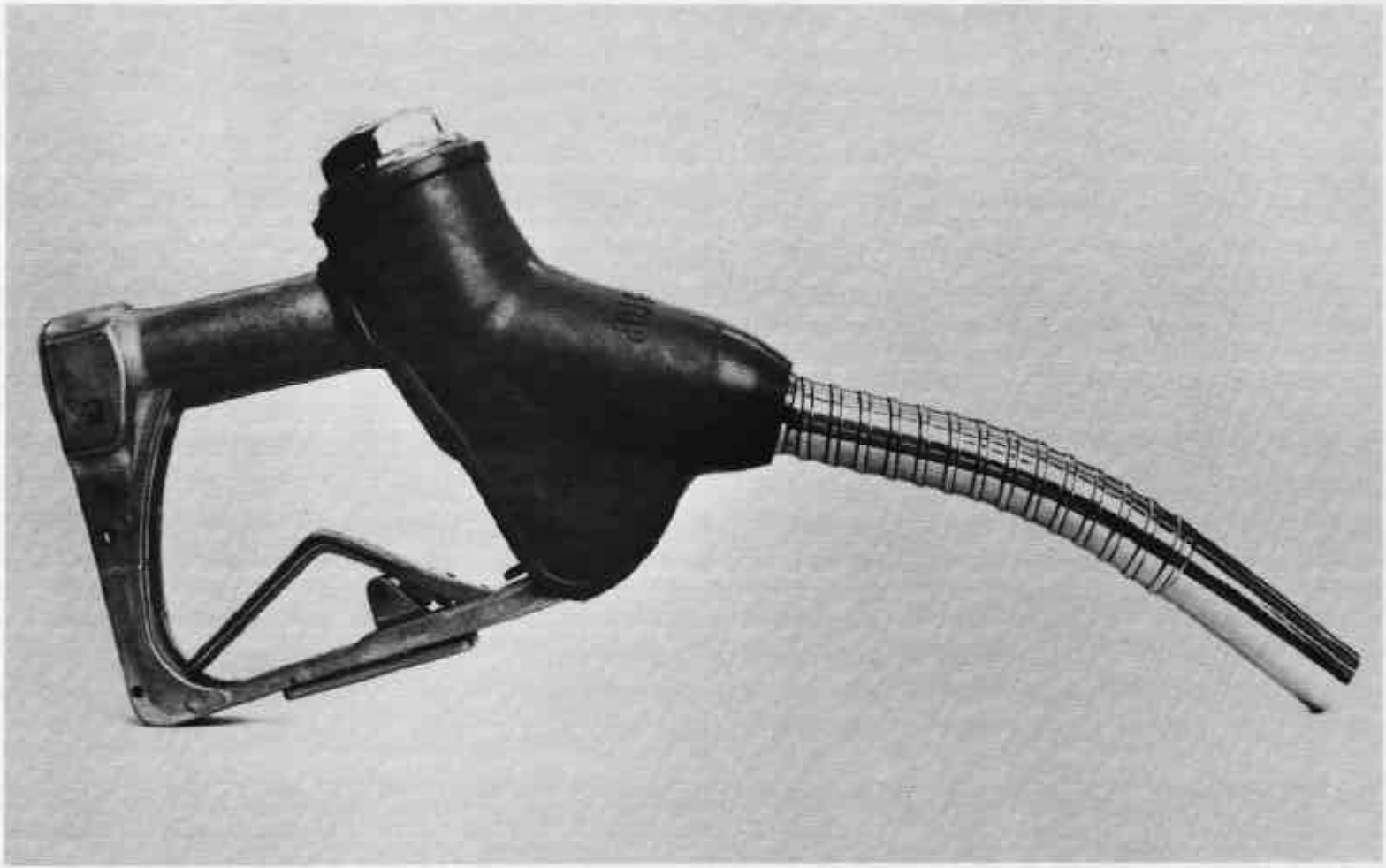
12/4/72



Avery-Hardoll PP10C Hose Nozzle

FIGURE 5/6A/38 - 29

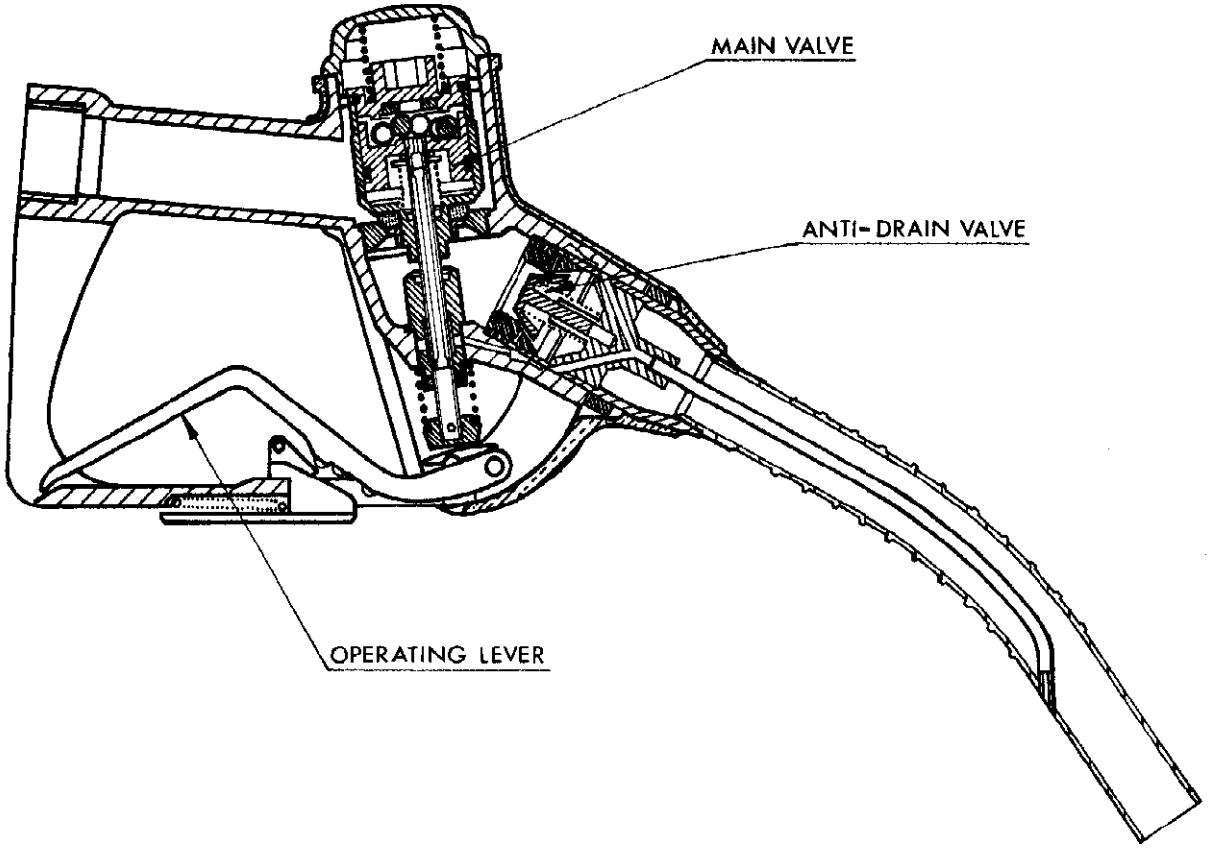
12/4/72



Avery-Hardoll AHQ77 Hose Nozzle

FIGURE 5/6A/38 - 30

12/4/72



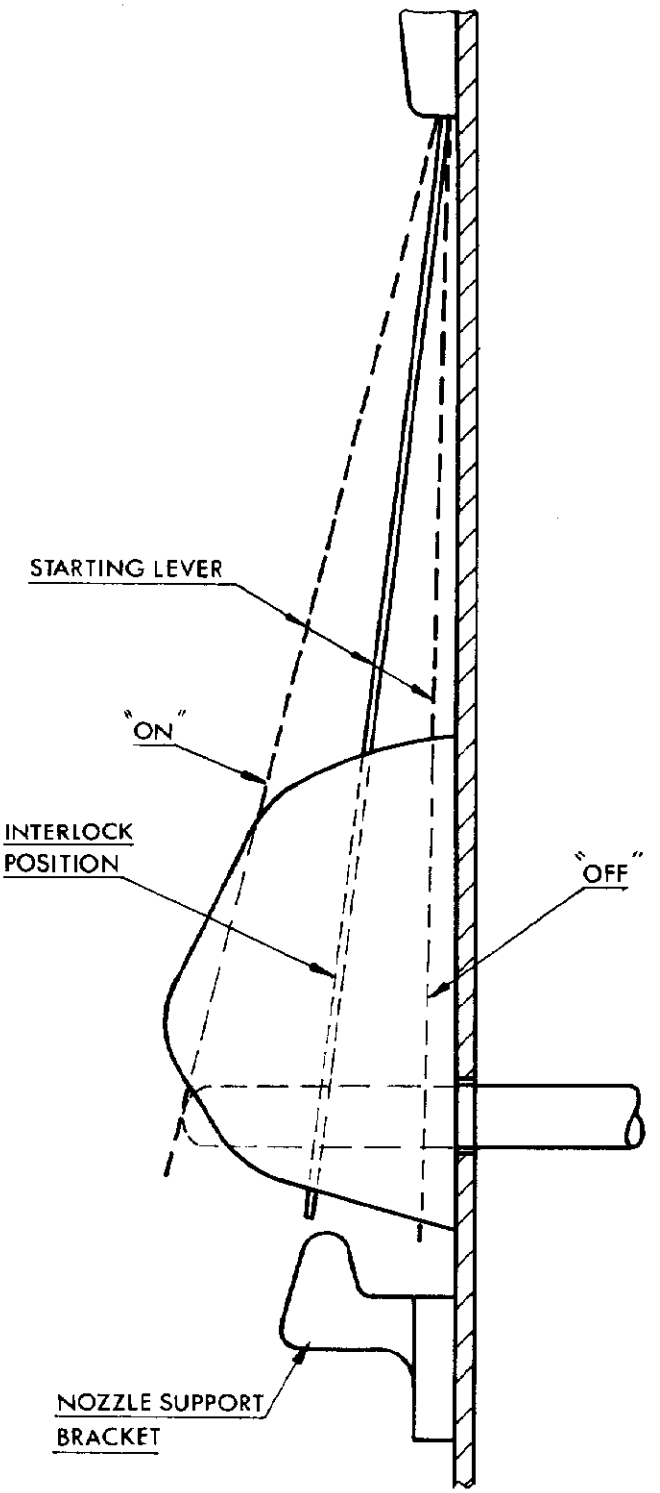
Avery-Hardoll AHQ77 Hose Nozzle

FIGURE 5/6A/38 - 31

Avery-Hardoll Nozzle Hang-up Bracket
and Starting Lever

12/4/72

FIGURE 5/6A/38 - 32

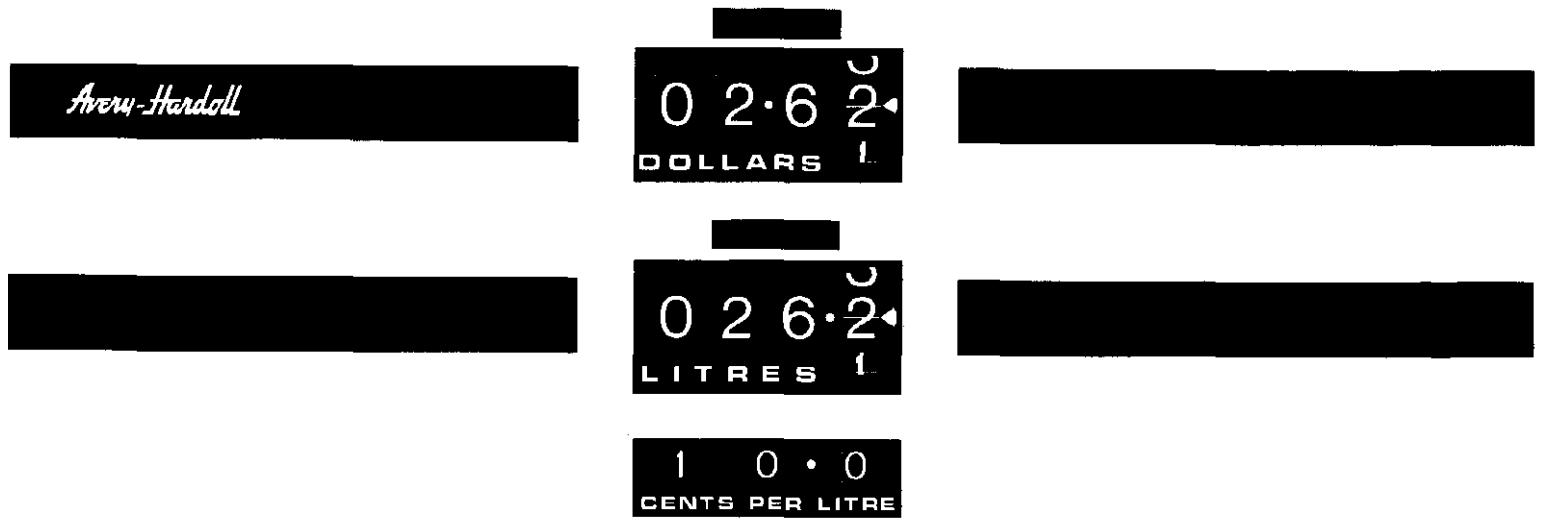


Avery-Hardoll Nozzle Hang-up, Interlock Position

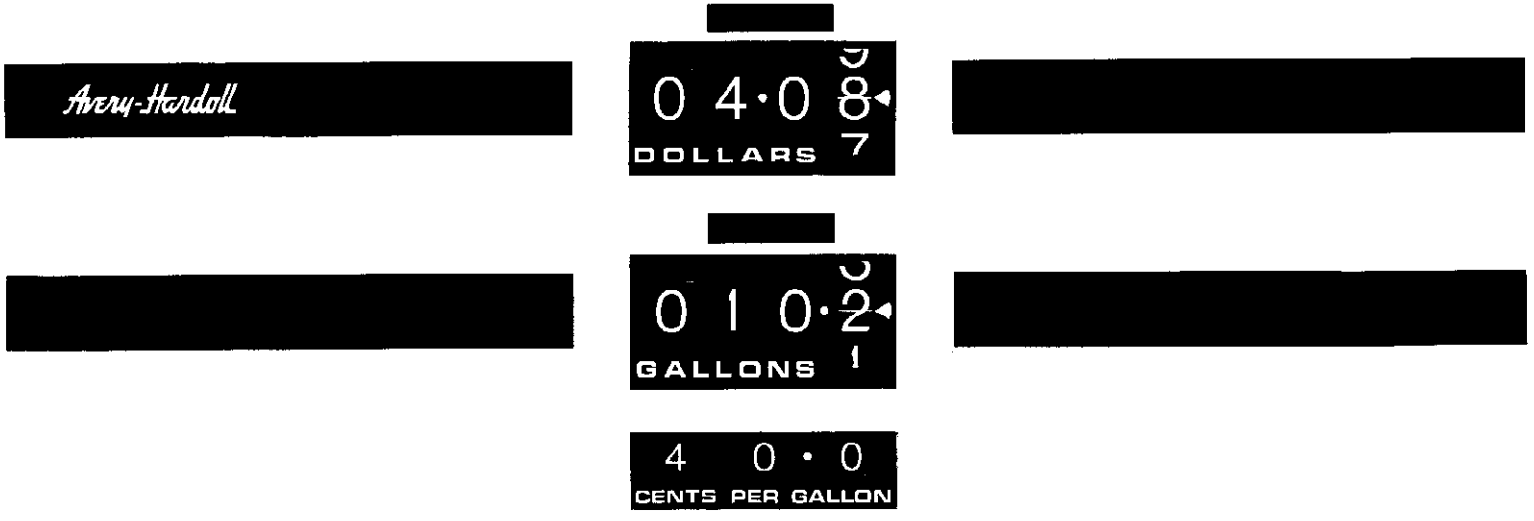
12/4/72

FIGURE 5/6A/38 - 33

12/4/72



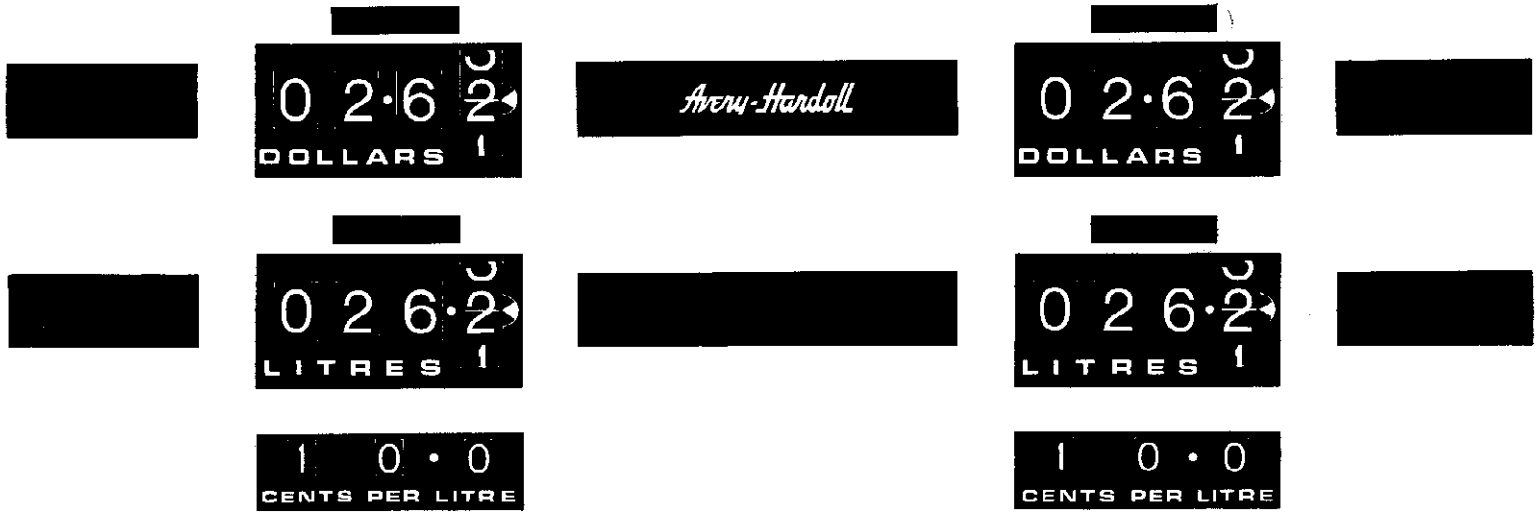
Dial Face for Single Driveway Flowmeter — Litres



Dial Face for Single Driveway Flowmeters — Gallons

FIGURE 5/6A/38 - 35

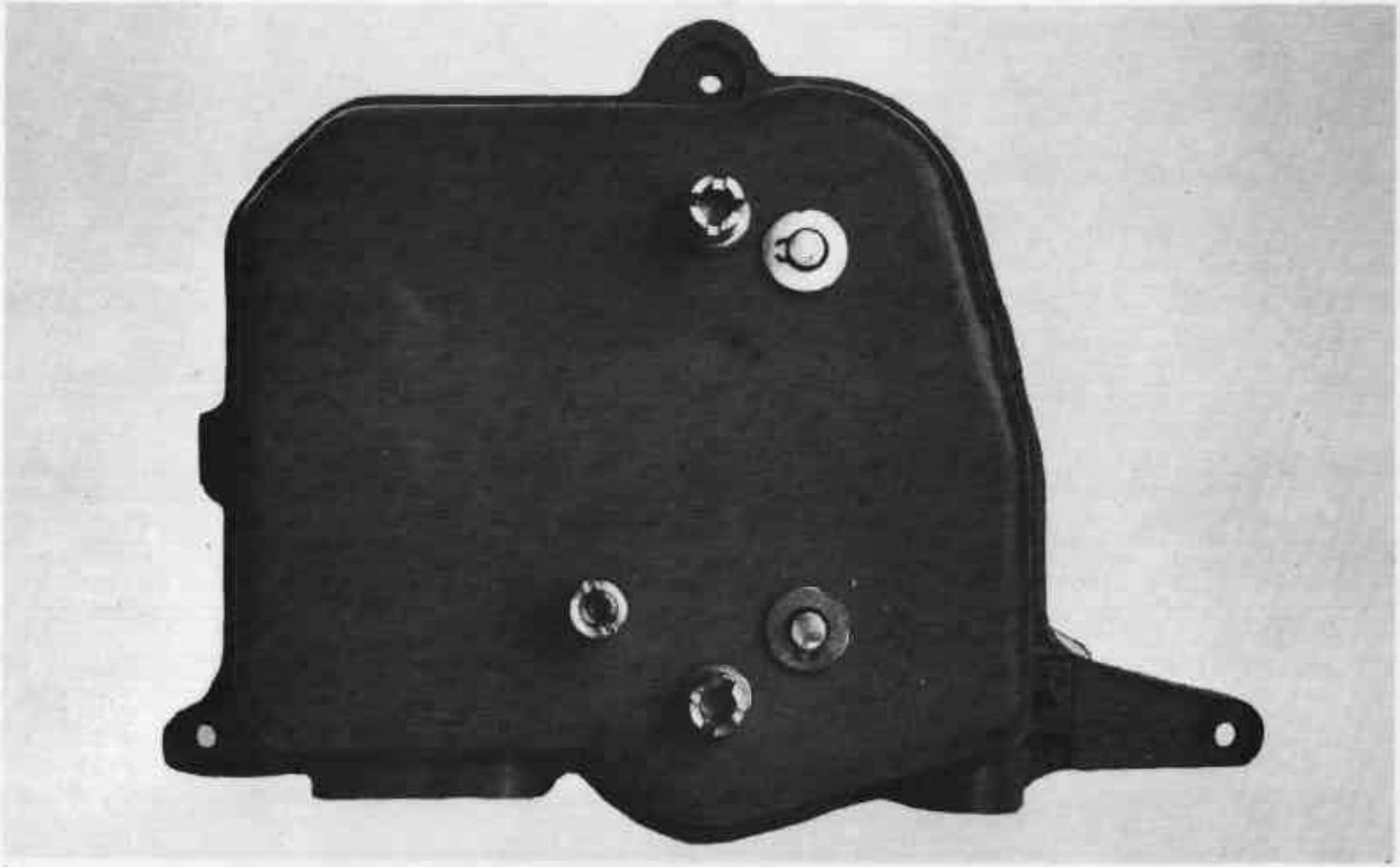
12/4/72



Dial Face for Dual Driveway Flowmeter — Litres

FIGURE 5/6A/38 - 36

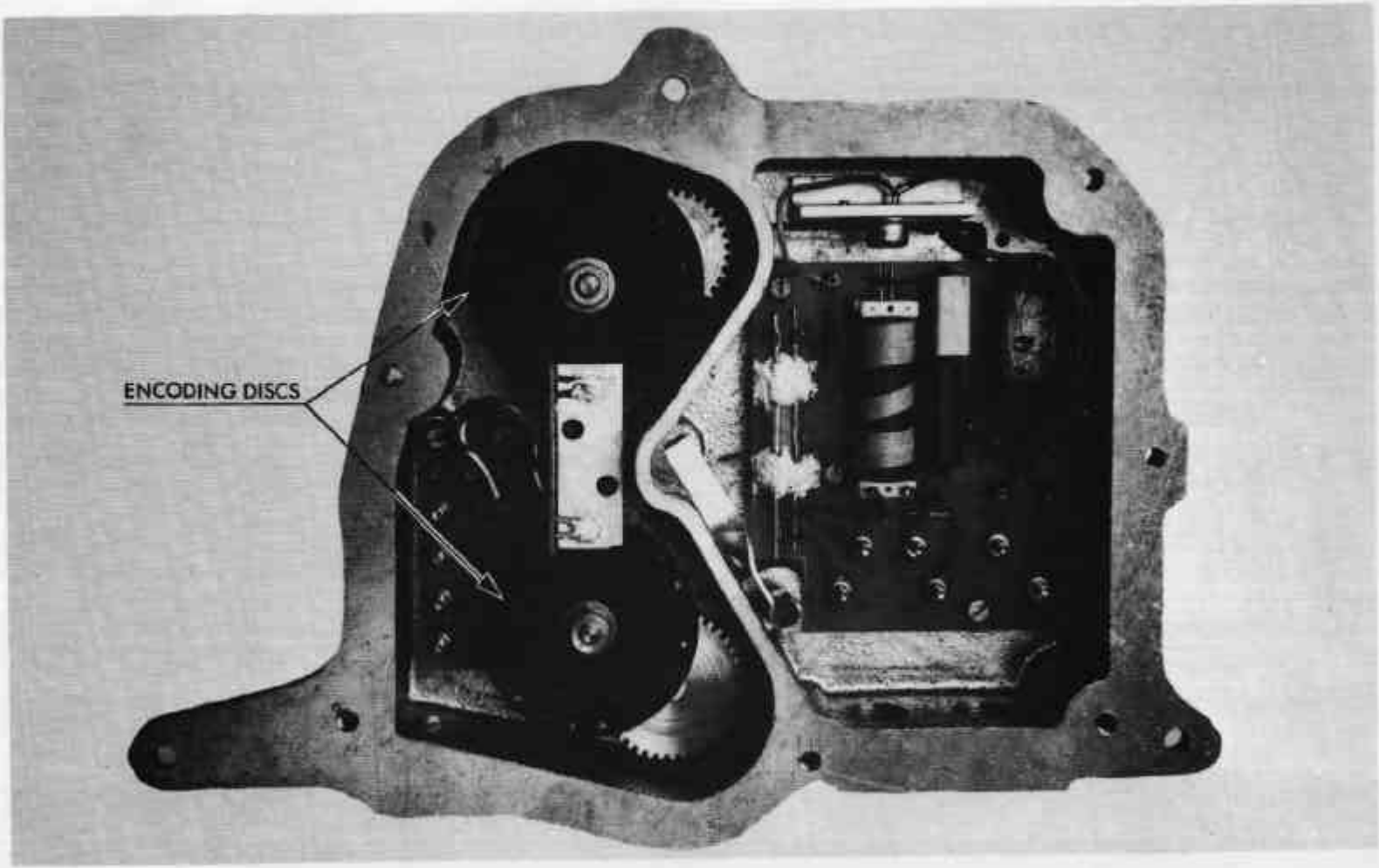
12/4/72



Production Engineering Pulse-transmitter Unit

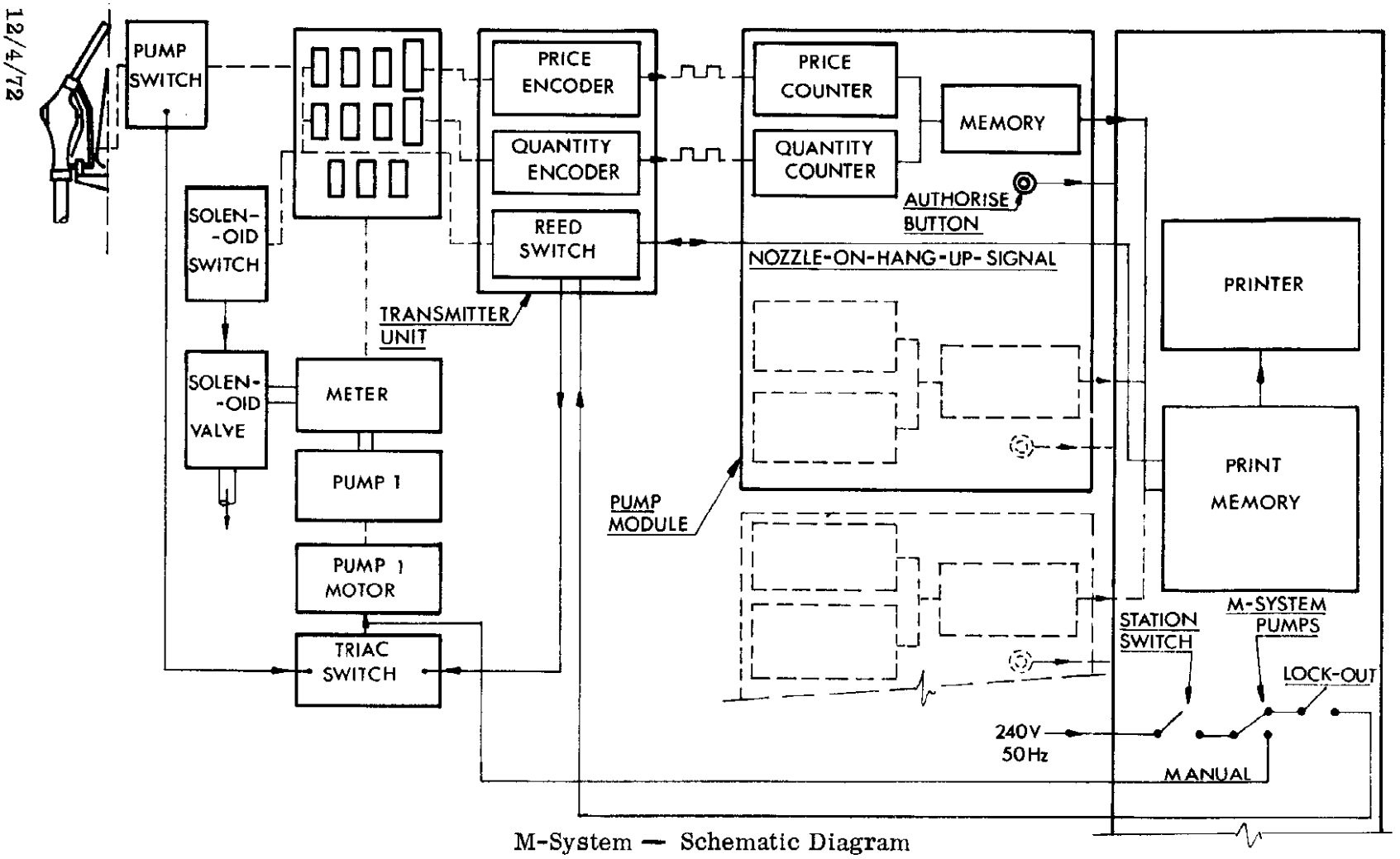
FIGURE 5/6A/38 - 37

12/4/72



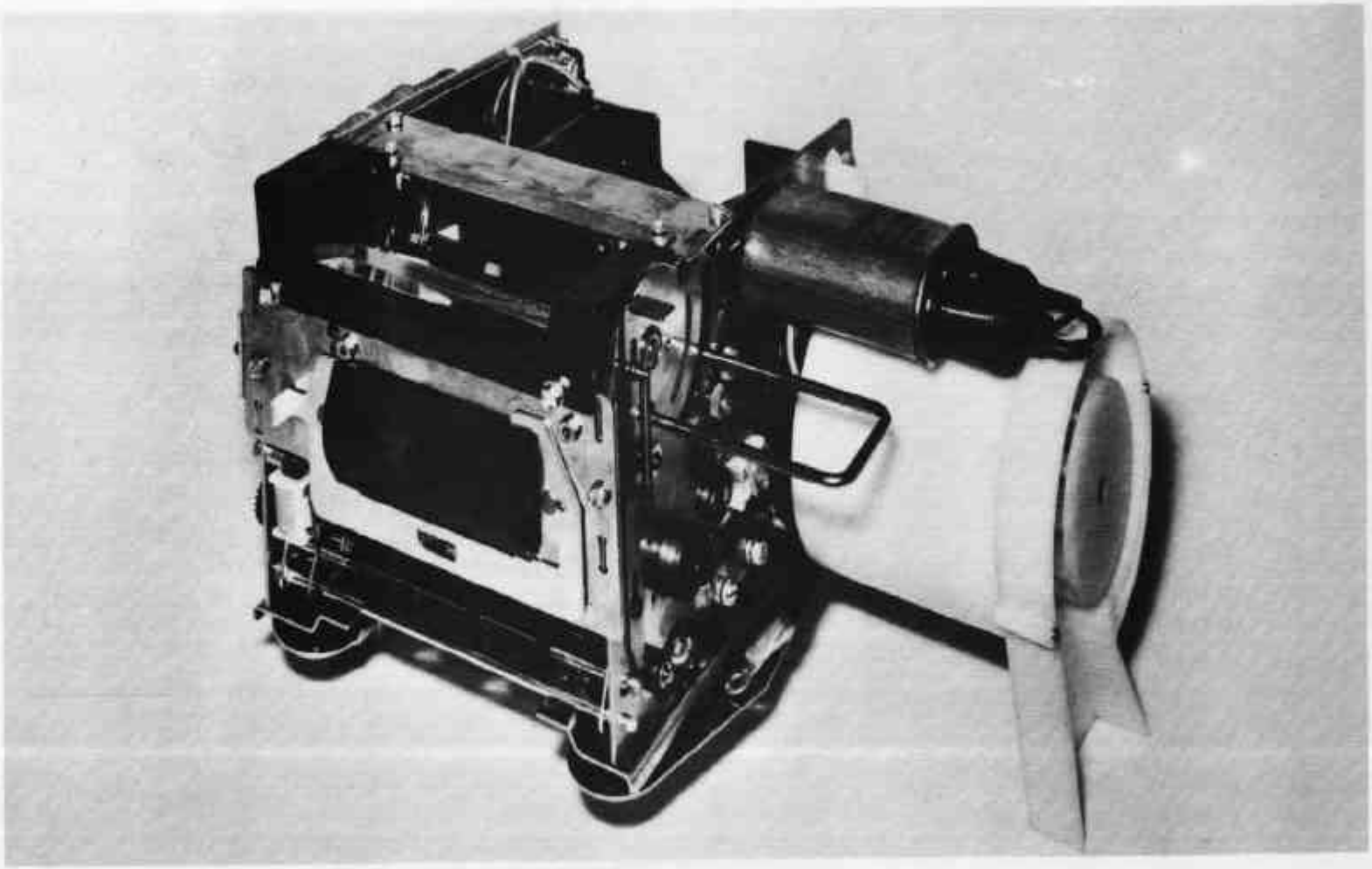
Production Engineering Pulse-transmitter Unit (cover removed)

FIGURE 5/6A/38 - 38



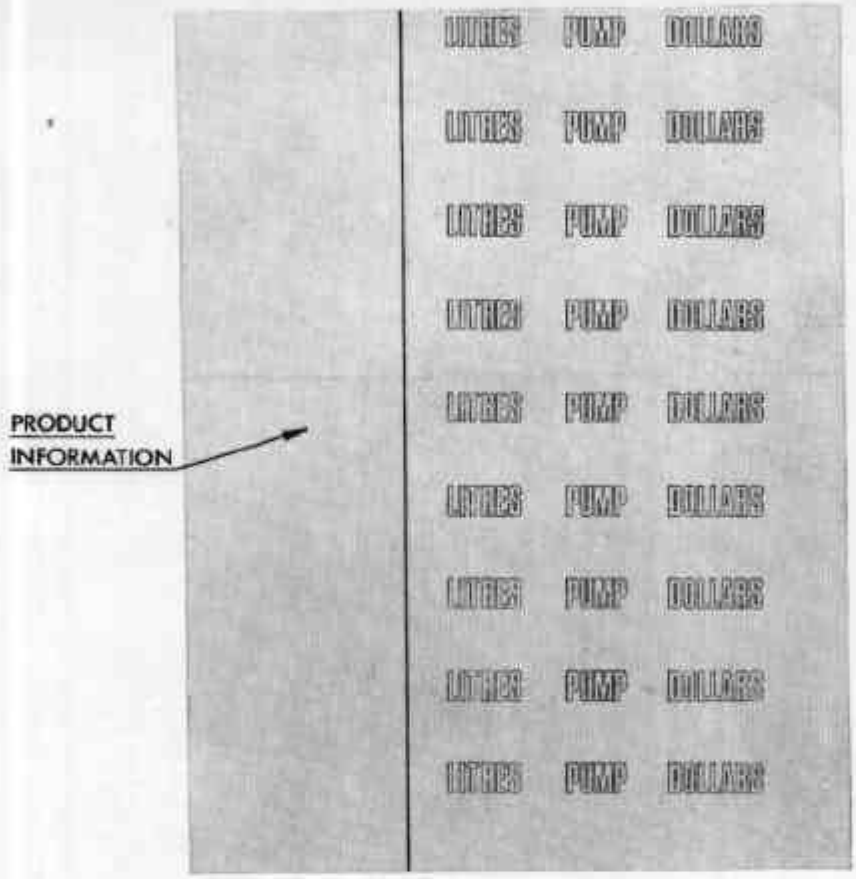
M-System — Schematic Diagram

FIGURE 5/6A/38 - 39

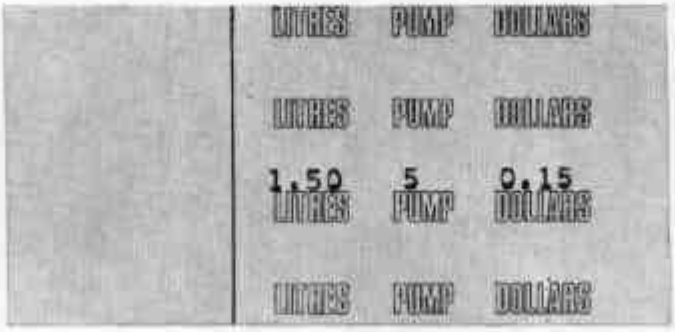


Friden Ticket Printer

FIGURE 5/6A/38 - 40



(a) Section of preprinted ticket roll before printing
(actual size)

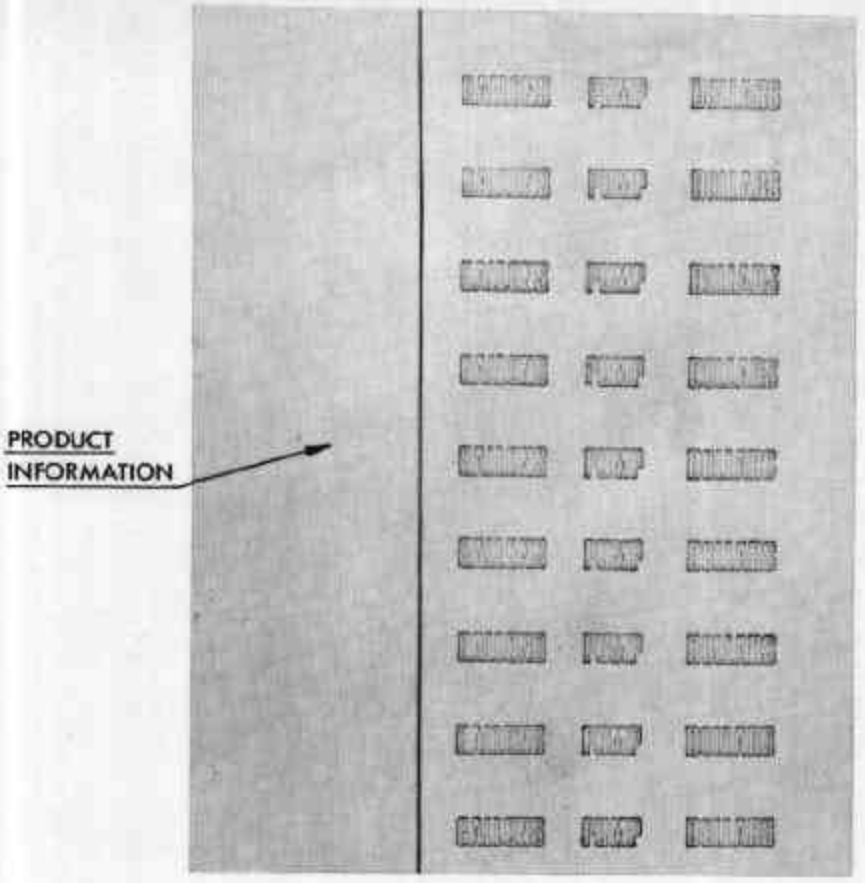


(b) After printing
(actual size)

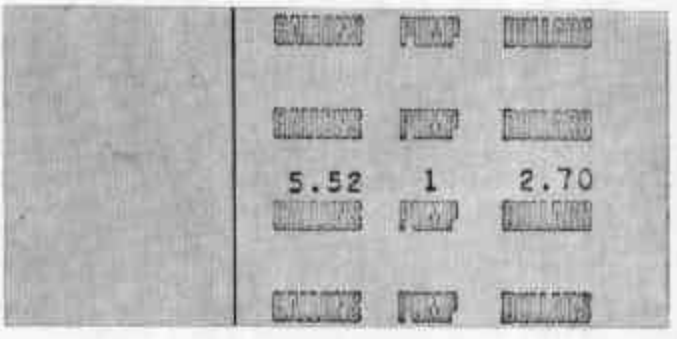
Sample Ticket — Litres

12/4/72

FIGURE 5/6A/38 - 41



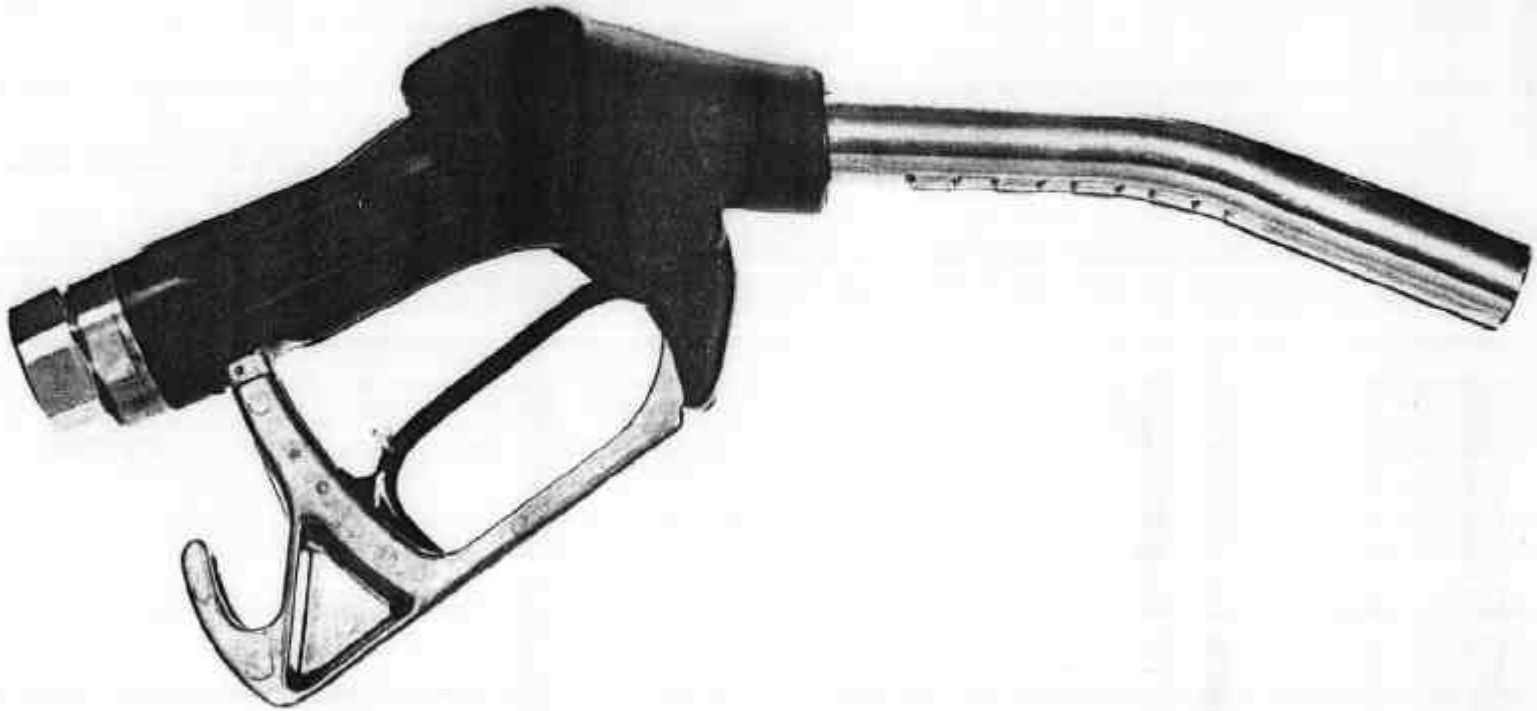
(a) Section of preprinted ticket before printing
(actual size)



(b) After printing
(actual size)

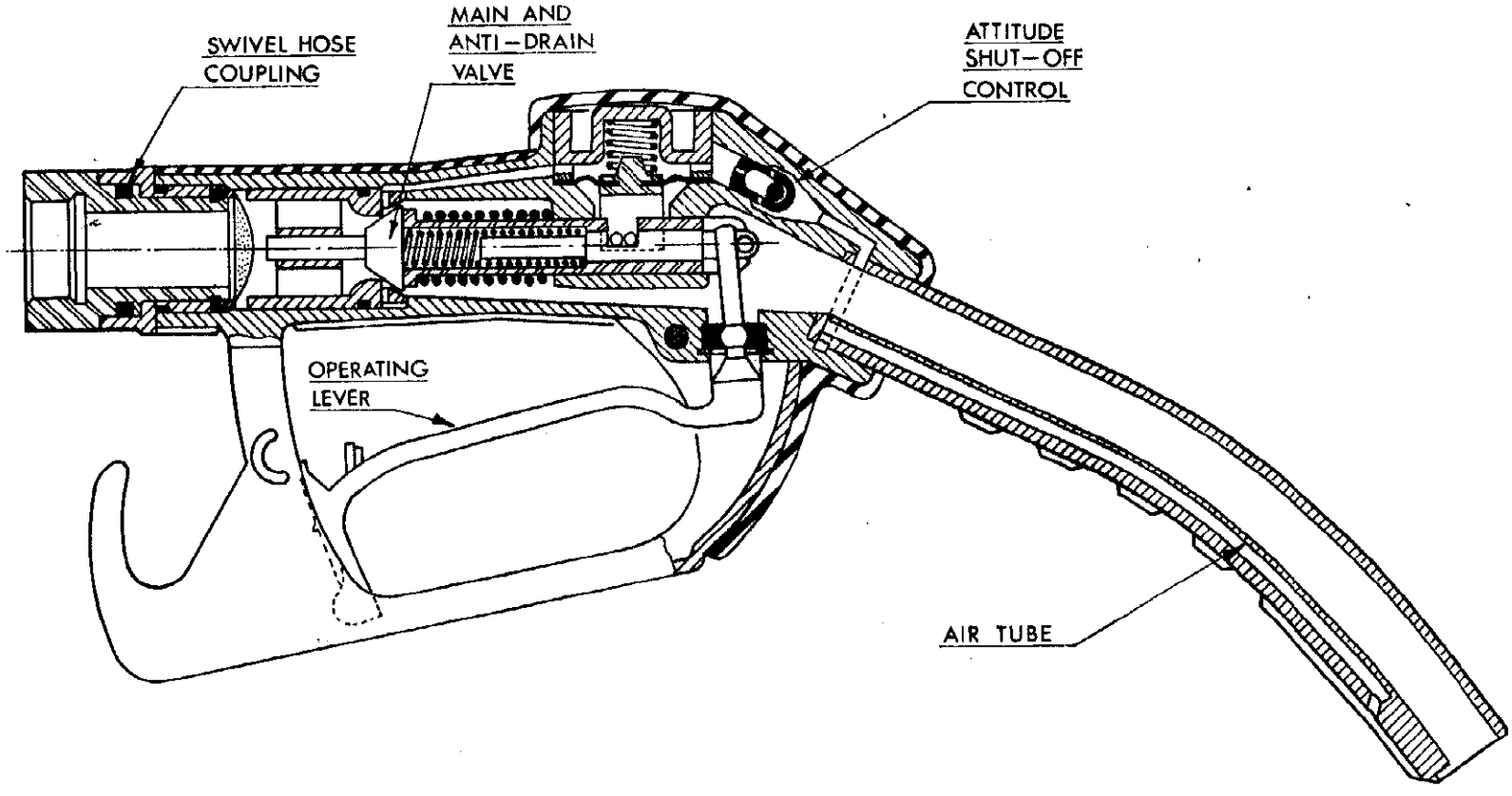
Sample Ticket — Gallons

12/4/72



ZVA Slimline Automatic Hose Nozzle

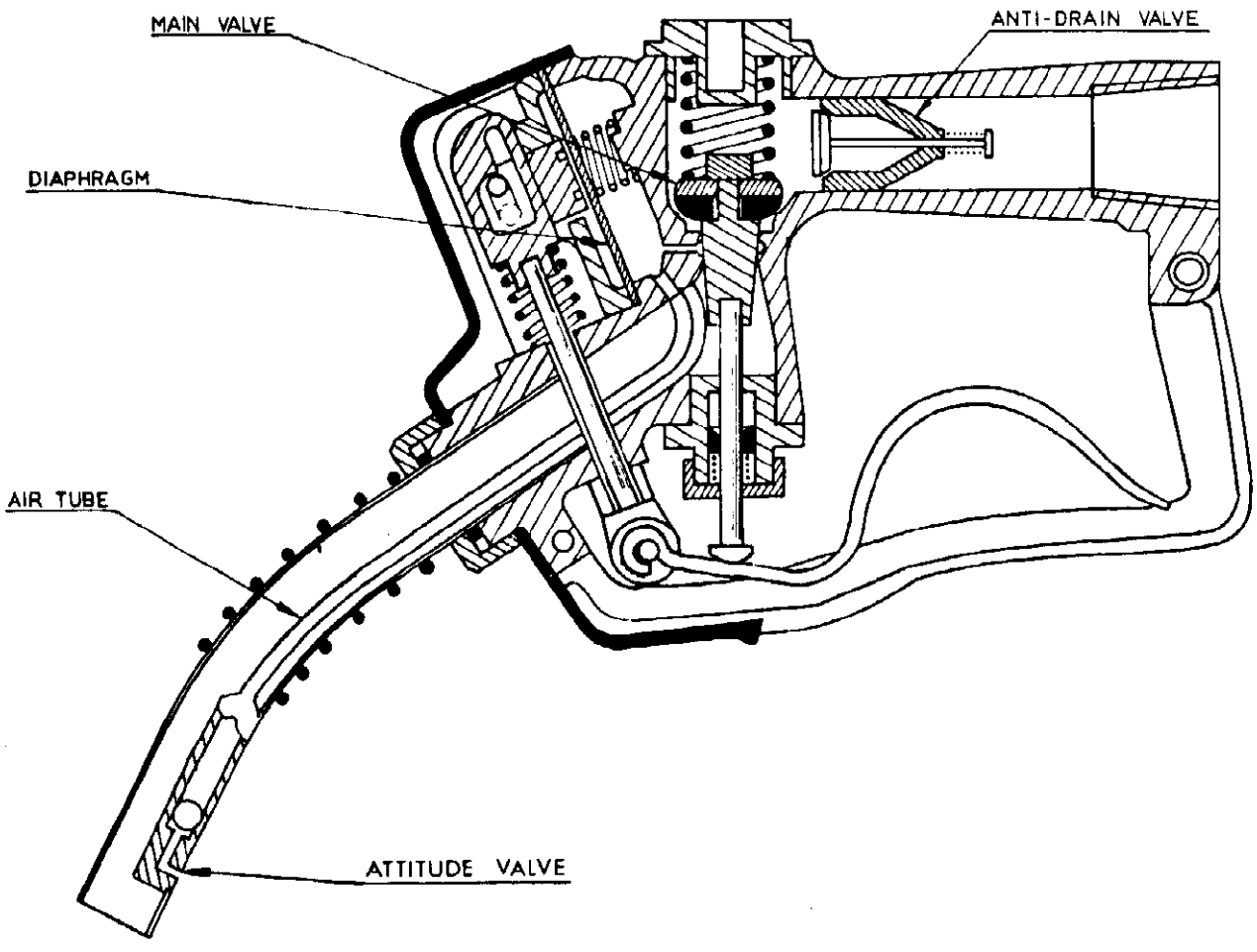
FIGURE 5/6A/38 - 43



ZVA Slimline Automatic Hose Nozzle

STM 377 Automatic Hose Nozzle

FIGURE 5/6A/38 - 45



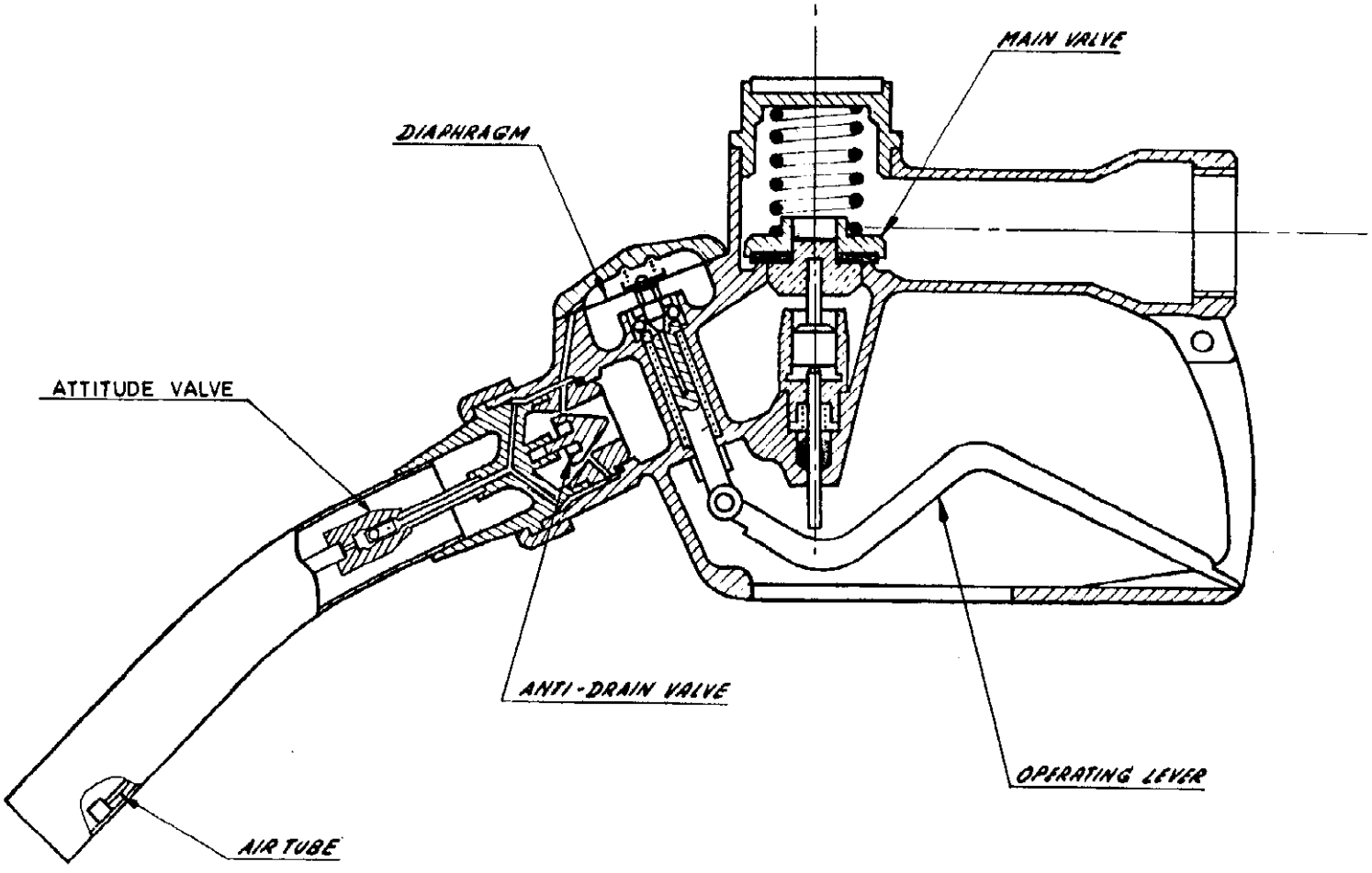
STM 377 Automatic Hose Nozzle — Schematic Diagram

FIGURE 5/6A/38 - 46

15/3/78

OPW 1AS Automatic Hose Nozzle

FIGURE 5/6A/38 - 47



OPW 1AS Automatic Hose Nozzle — Schematic Diagram