Velan Valves Ltd
Leicester, England

MONOVALVE FLOAT THERMOSTATIC INLINE CONNECTIONS

MODELS MFT - 0/1/2/3/4

INSTALLATION, SERVICING AND MAINTENANCE INSTRUCTIONS

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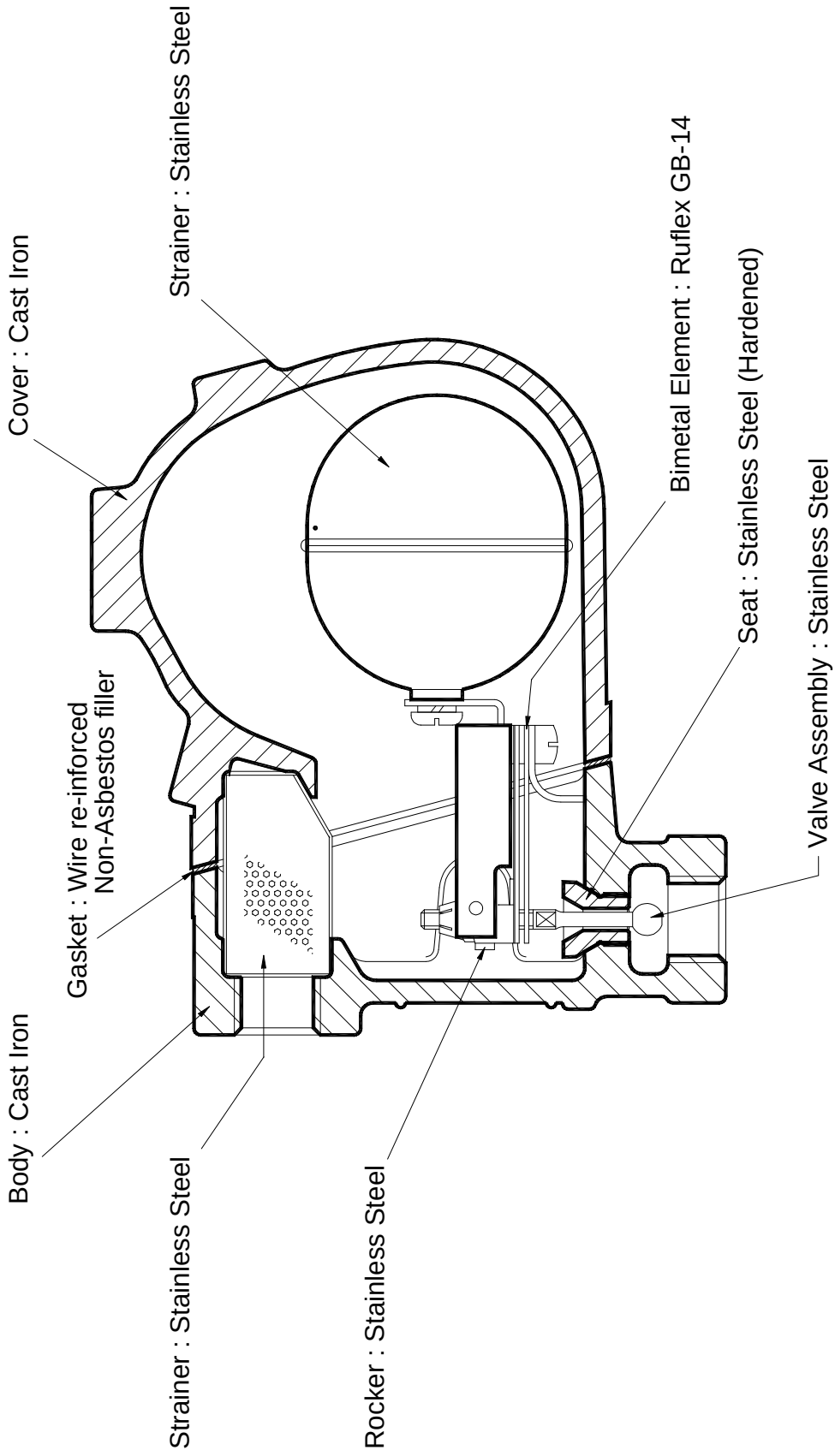
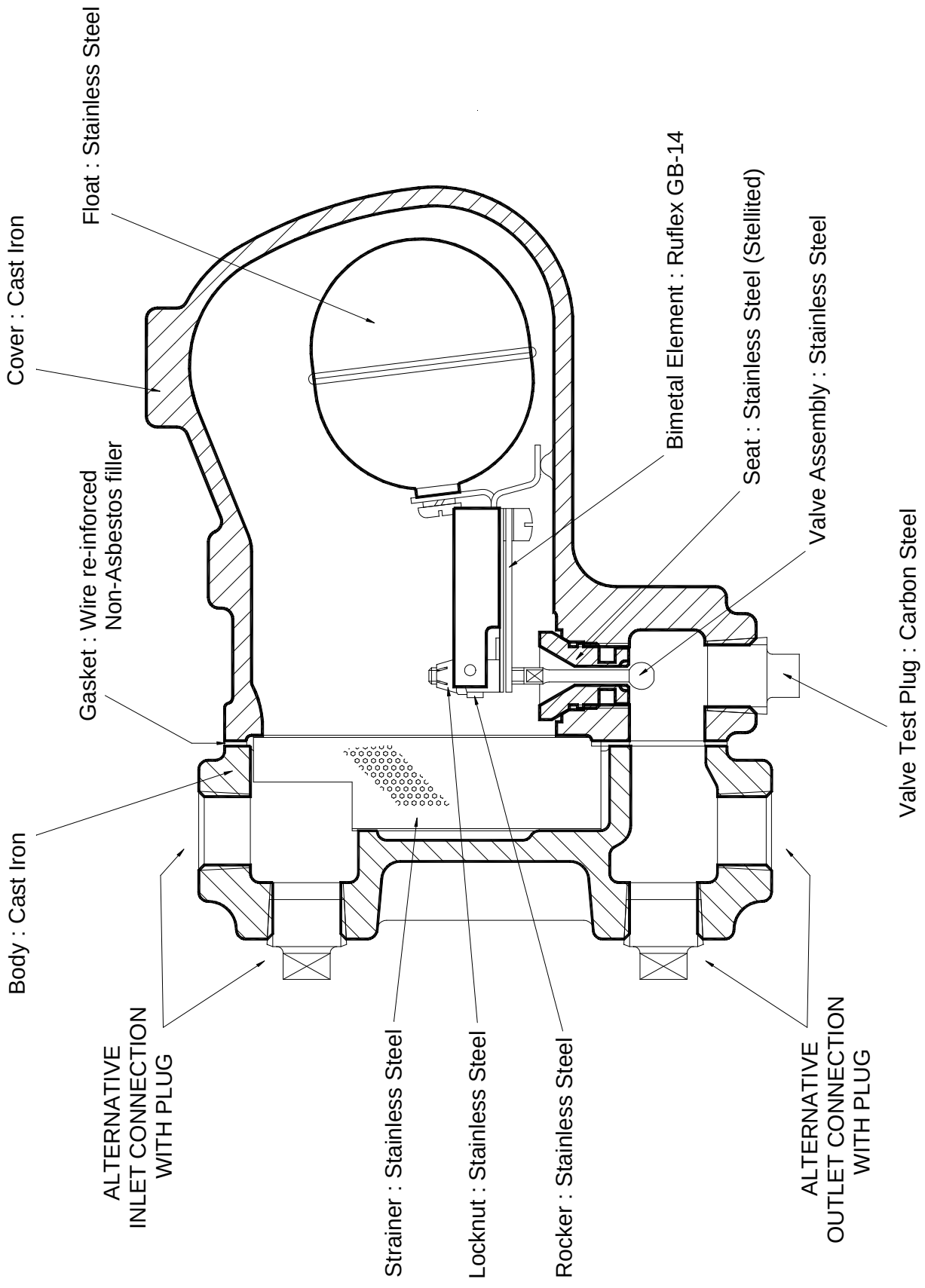
MODELS MFT - 0


Cover : Cast Iron
Strainer : Stainless Steel
Bimetal Element : Ruflex GB-14
Seat : Stainless Steel (Hardened)
Valve Assembly : Stainless Steel
Gasket : Wire re-inforced
Non-Asbestos filler
Body : Cast Iron
Strainer : Stainless Steel
Rocker : Stainless Steel

MODELS MFT - 1/2/3/4



MFT Traps are particularly suitable for all types of process and Heating services, where the fast removal of air, condensate and Incondensibles at close to saturation temperatures is necessary to maintain the maximum rate of transfer of the heat energy Contained in the steam , and where the provision of a “Cooling Leg” before the trap is not possible. The unique construction of the MFT enables fast removal of air and condensate automatically through its valve orifice, unlike other F & T traps which require the provision of a secondary air venting mechanism. This Velan feature is particularly advantageous for batch type production, where output levels can be considerably increased.

INSTALLATION AND OPERATION

1. INSTALLATION

All MFT traps must be installed with the float horizontal and the body vertical with inlet connections at the top, as indicated by the flow direction arrows. Provision of a cooling leg is not necessary with MFT traps, which can be fitted adjacent to the vessel being drained if the installation layout requires this.

a. MFT-0 models are supplied with Right Angle - Down connections only – horizontal inlet, vertical outlet.

b. MFT-1/2/3/4 models are supplied with the dual inlet/outlet connections – horizontal and vertical - which will meet most combinations fig.1. Two plugs are supplied to blank off the connection not required.

c. It is not necessary to break the pipe connections to carry out adjustments or maintenance. By removing the cover all internal parts are accessable and can be replaced .

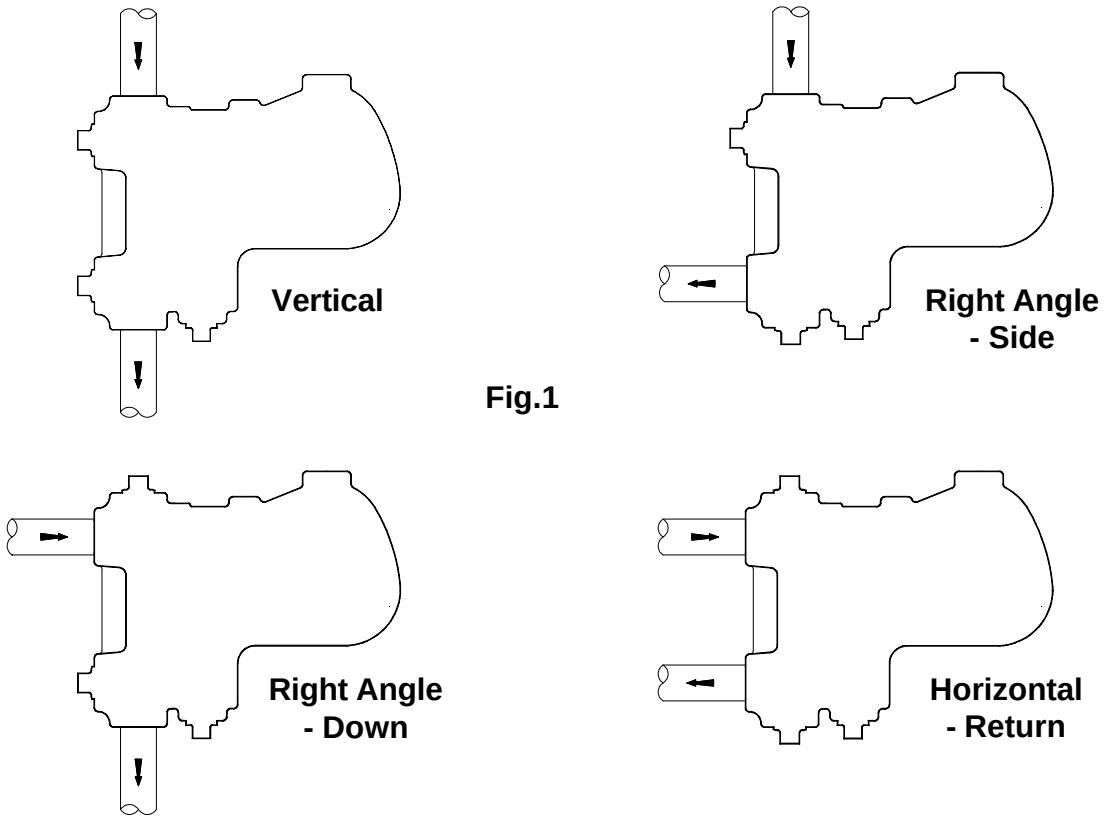


Fig.1

2. OPERATION

a. Air Venting and Cold Water (Fig .2)

When cool the bimetal is relaxed and line pressure or gravity ensures the valve is fully open ensuring the automatic removal of large quantities of air, incondensible gases , and cold water. A secondary air venting system, as required by other types of F & T traps, is not required.

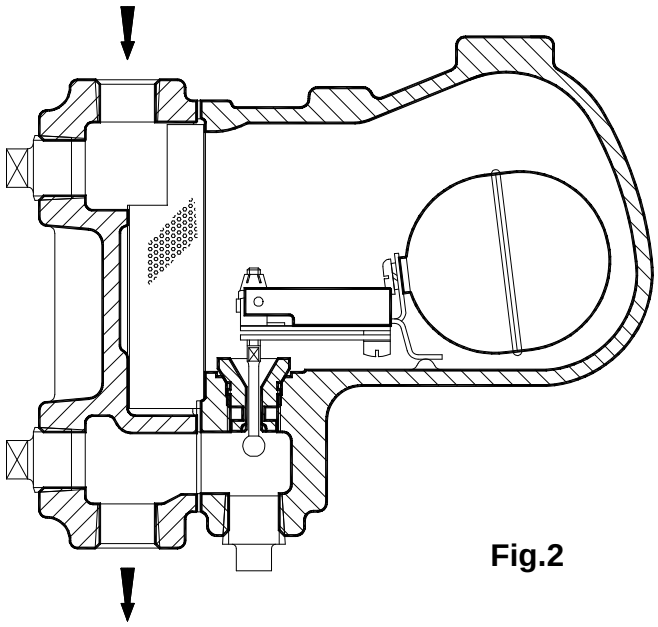


Fig.2

b. Steam Trapping (Fig 3)

As the temperature increases, the bimetal deflection pulls the valve towards the valve seat until steam temperature is reached, when the force generated holds the valve tight against the pressure acting on the valve, The float has no effect whatsoever on this closing operation.

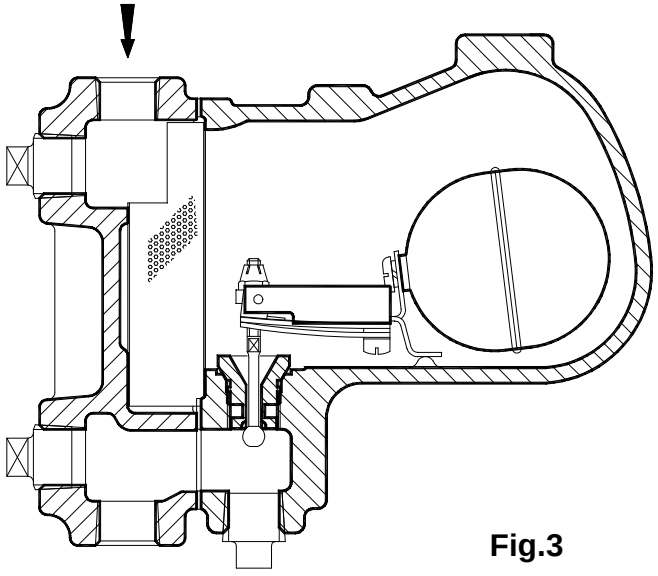


Fig.3

c. Discharge of Steam Hot Condensate (Fig 4)

As the condensate enters the trap the float rises , the high temperature maintaining the bimetal closing force. As the condensate level rises the increasing buoyancy force of the float is transmitted against bimetal force, until at a predetermined level the valve is opened fully , to give unrestricted flow. Condensate, even if close to saturation temperature, will be dis-charged. The trap will adjust to condensate flow conditions, closing if none present, or providing continuous discharge at the same rate as condensate reaches the trap. Air or gases mixed with the condensate will be discharged and the trap is self-draining as the orifice is at the low point of cover.

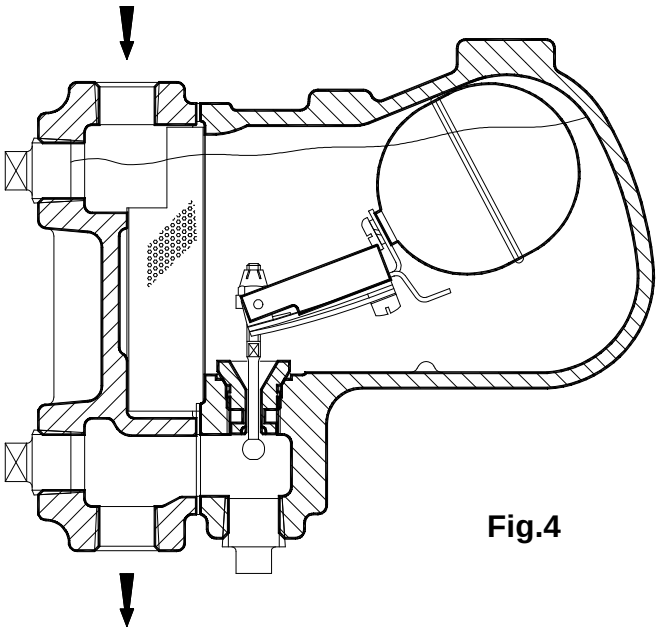


Fig.4

d. Check Valve (Fig 5)

It is not necessary to fit a separate check valve below the trap in a ‘Closed’ return line. The free floating, spherical valve located below the valve orifice is self seating and any reverse flow will close the valve immediately.

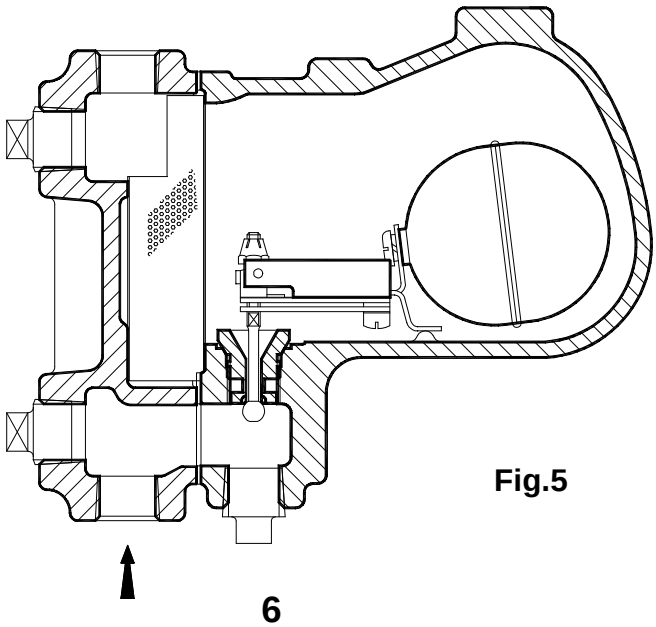


Fig.5

e. Excess Pressure Waves (Water Hammer)

Pressure waves in excess of normal operating pressures will overcome the bimetal closing force, opening the valve and dissipating the excess pressures down-stream, thus preventing damage to the float or other internals.

f. Checking Trap Operation

If discharge is to open drains, correct operation can be observed visually. The trap will discharge continuously when plant operates in a continuous operation mode. Do not confuse “Flash Steam” emanating from high temperature condensate after leaving the trap, with live steam leakage. When installed in a “closed” return system taking the condensate to another position, a test valve can be fitted downstream of the trap (Fig 6). Alternatively a contact temperature recorder can be used to measure the temperature differrential across the trap. If the temperature in the condensate return pipe exceeds the equivalent saturated steam temperature for the actual back pressure in the return pipe (excluding any rising frictional heads), this will indicate that the trap may be passing steam.

Ultra-sonic meters must be used with care when the trap is operating in a continuous discharge mode as the results indicated can be misleading.

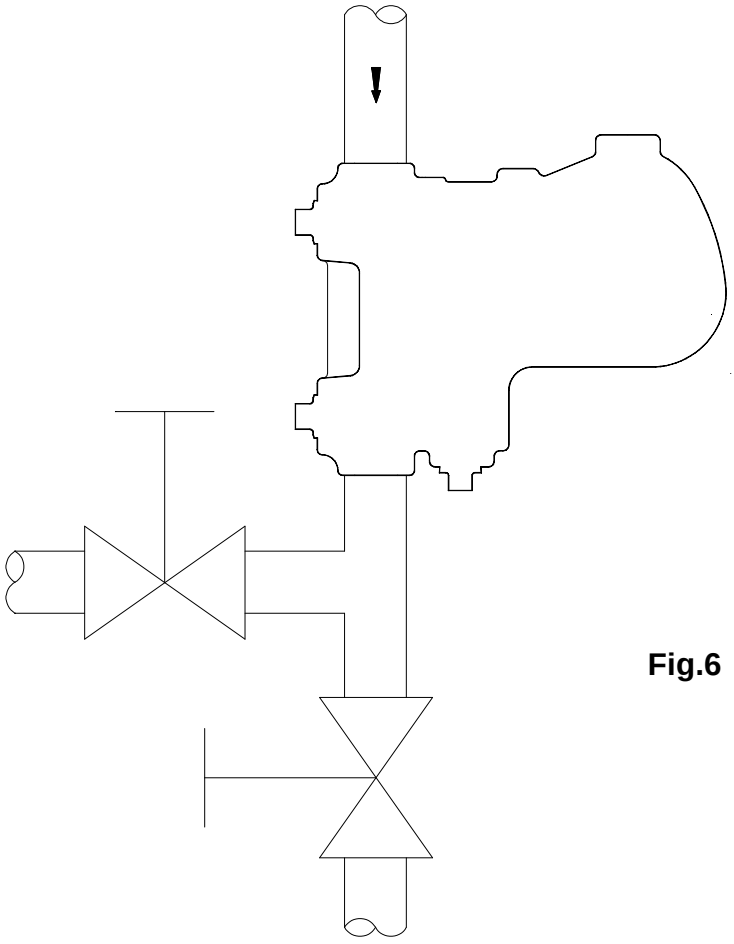


Fig.6

3. ADJUSTMENT

NOTE: Before undertaking any adjustment or repair work always ensure that the steam trap is fully isolated from the system. Before removing any covers, loosen bolting and break gasket seal to release any pressurised steam trapped in the body

a. Bimetal/Valve Clearance

To ensure correct operation of the trap the clearance ‘X’ is factory set in accordance with the table below. If the clearance is smaller than that shown the sensitivity of the trap will be reduced and sub-cooled condensate will be discharged. The discharge capacity of the trap will also be reduced, and its air venting facility whilst hot affected.

Increasing the clearance will increase sensitivity. For Certain applications such as syphon drained cylinder Machines, where ‘Steam Locking’ can prevent traps from discharging condensate fast, or where a continuously close to saturation temperature is necessary – such as hospital sterilizers - a small increase in clearance ‘X’ to allow a small bleed of steam, will ensure fast and efficient operation of the equipment. Increasing the clearance will also increase the discharge capacity of the trap.

b. Setting the Clearance (Fig 7)

The clearance is measured at ‘X’ between the top of the rocker and the underside of the self-locking adjusting nut.

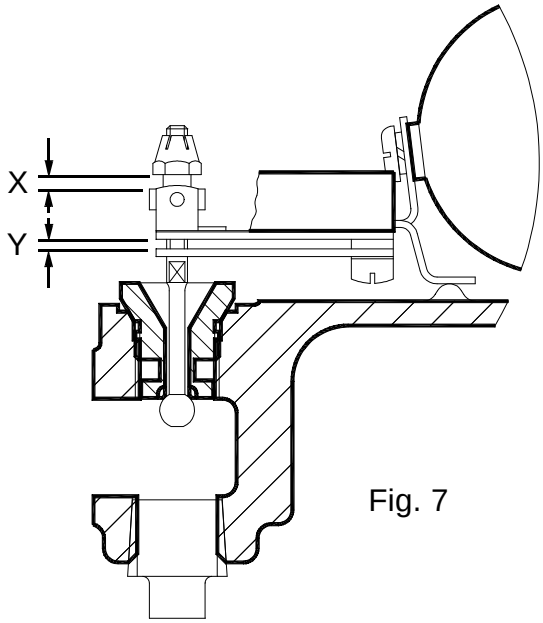


Fig. 7

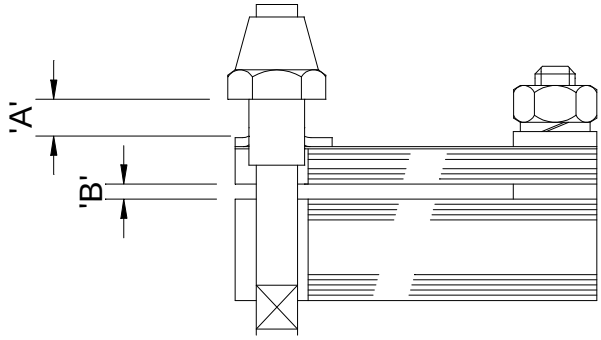
The standard factory setting is calculated at an ambient temperature of 65 F (18.3 C). If setting takes place at an alternative ambient temperature the clearance must comply with the setting table shown on next page.

BIMETAL PLATES – RUFLEX GB-14

NOTE

A) COLD CLEARANCE GAUGE SHOULD BE A SLIDING FIT BETWEEN THE LOCKNUT AND ROCKER.

B) WHEN CHECKING THE CLEARANCE 'A' WITH THE GAUGE DO NOT REDUCE THE CLEARANCE 'B' BETWEEN THE BIMETAL SEGMENTS, THIS MUST ALWAYS BE EQUAL TO THE SPACER IN THE ELEMENT.



ROOM TEMP		MFT
°F	°C	
50	10	.086
55	12.8	.084
60	15.6	.081
65	18.3	.078
70	21.1	.075
75	23.4	.072
80	26.7	.070
85	29.4	.067
90	32.2	.064
95	35	.061
100	37.8	.059

SETTINGS IN INCHES

A standard setting gauge is available- see tool part numbers , or feeler gauges of the correct amount can be used.

The gauge should be a sliding fit between the locknut and rocker plate, and it is important that the clearance 'Y' (Fig 7) between the bimetal segments is not reduced. This should always be equal to the spacer in the element.

To increase clearance fit a stem key (see tool part numbers) to the flat on the stem below the bimetal and turn the adjusting nut anti-clockwise. To reduce the clearance turn clockwise.

For the trap to operate effectively against high back-pressure, above 30% of the inlet pressure, the clearance should be increased gradually upto a maximum of one full turn approximatley. The trap will operate upto a back pressure of 80% . Whilst the trap will operate without re-adjustment, the discharge temperature and quantity of condensate discharged will be reduced. Increasing the clearance will compensate and provide normal discharge. Adjustment should not be increased beyond the point where the trap passes steam.

4. MAINTENANCE

Velan Traps are designed for in-line servicing and Repair. Removing the cover provides access to internals for all MFT models.

a. Dis-assembly

MFT - 0 Fig.8

i. Remove cover bolts and cover to gain access to the internals, and remove strainer and gasket.

ii. Loosen pivot pins located in the body until clear of pivot arms and remove bimetal/float assembly. Do not lose the two small washers.

iii. Unscrew valve seat and remove valve assembly and seat. Remove adjusting nut to obtain valve.

iv. Unscrew float retaining screw.

MFT - 1/2/3/4 - Fig.9

i. Remove cover bolts and cover. All internals are fitted inside cover, except strainer and gasket which can be removed at this stage

NOTE : The position of the drilled pivot pins holes may vary between traps with different pressure ratings. If a quantity of traps are being worked on simultaneously with different ratings, mark bodies/float assemblies to ensure correct parts used when re-assembling.

ii. Loosen pivot pins until clear of float arms. Some float arms have multiple pivotpin locations. Mark which location point is used, this is important. Remove bimetal/float assembly. Do not lose the two small spigot washers.

iii. Unscrew valve seat and remove valve assembly and seat. Remove adjusting nut to obtain valve.

MODELS MFT - 0

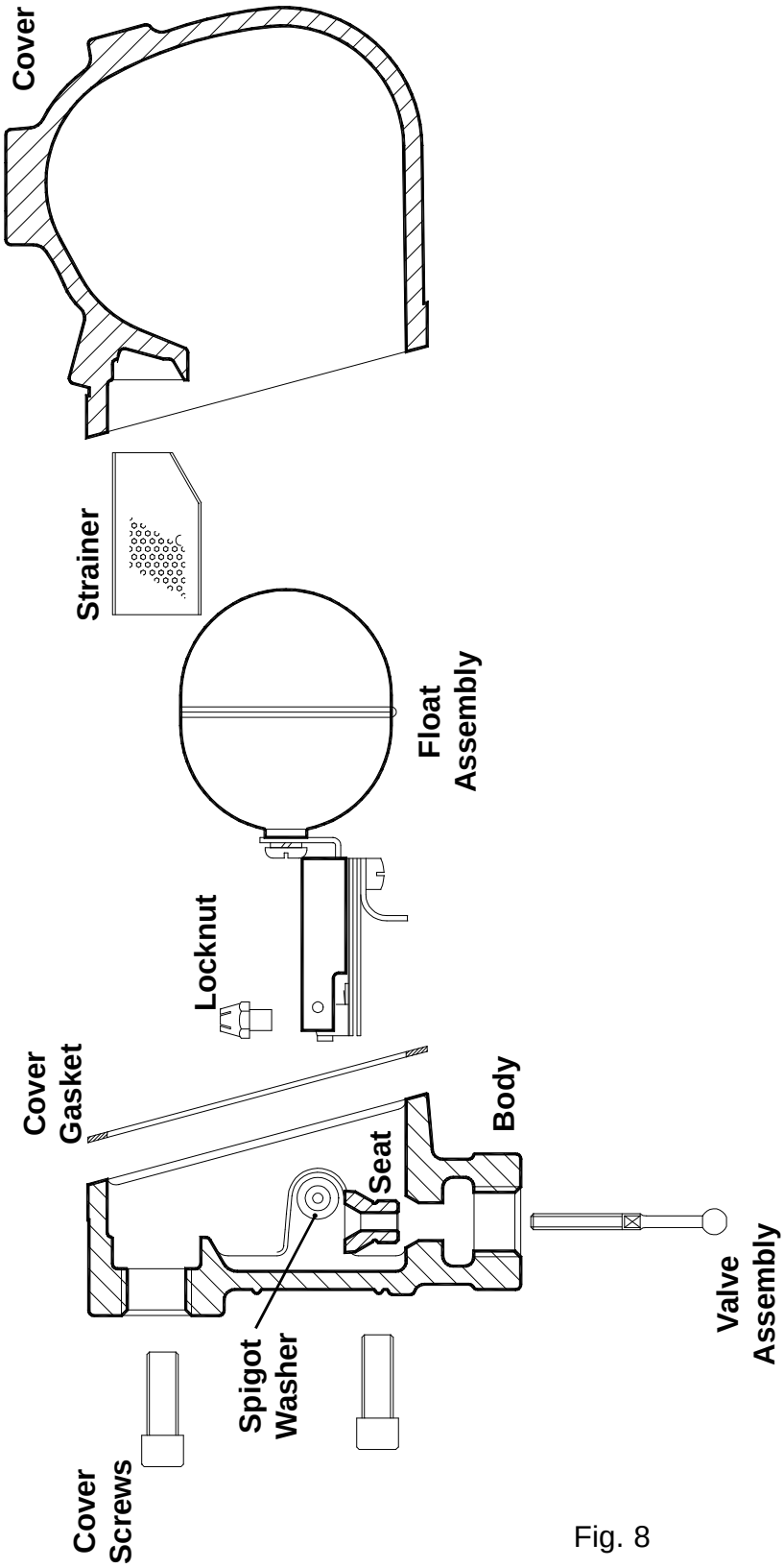


Fig. 8

MODELS MFT - 1/2/3/4

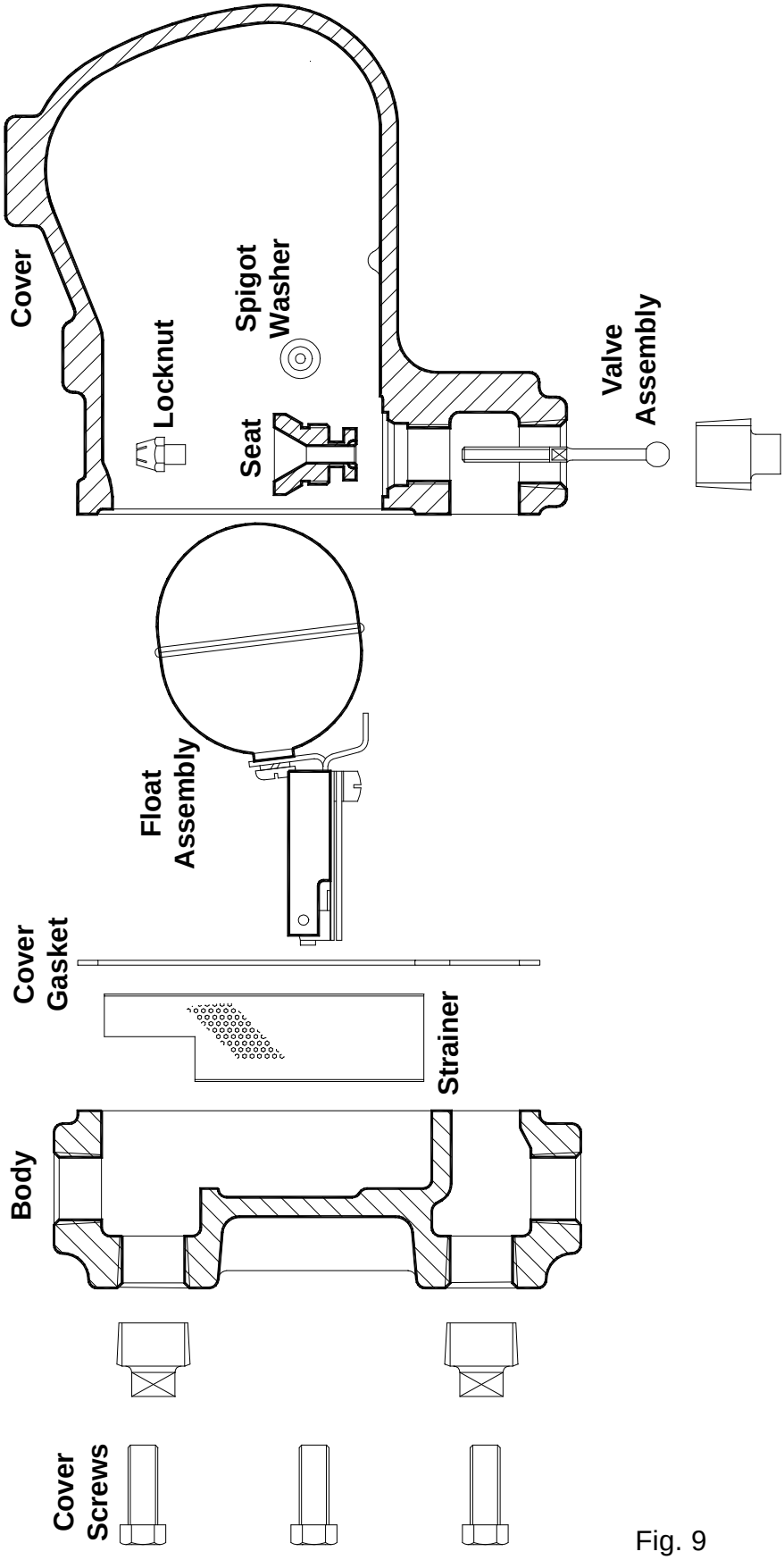


Fig. 9

c. Re-assembly

To Re-assemble, use the reverse procedure for dis-mantling.

i. Valve and Seat

Inspect valve and seat for wear or damage. If minimal repair by lapping (grinding) together using appropriate compound until all damage Is removed. If valve or seat is badly pitted or Withdrawn (cut), fit replacement item and lap together to ensure leak tight metal to metal seating . Before replacing seat in body check body/seat sealing faces to ensure no damage. If body seating is face damaged, re-machine using a drill or countersink with 60 included angle.

ii. Bimetal

Clean any sludge or dirt that might have adhered to the external faces, or between segments. If excessive replace the bi-metals.

iii. Float

Check no water has leaked into the float. Do not confuse with internal weight particles in some models. If float has leaked, replace it.

iv. Strainer

Clean strainer screen if necessary , replacing if permanently “Plugged” or damaged.

v. Replacing Bimetals / Float assembly

Re-locate pivot pins into float arm, ensuring correct location is used for arms with multi-port drilling. The spigot washers must be fitted on the pivot pins, between the arms and cover wall with the small diameter adjacent to the float arms. fig.10

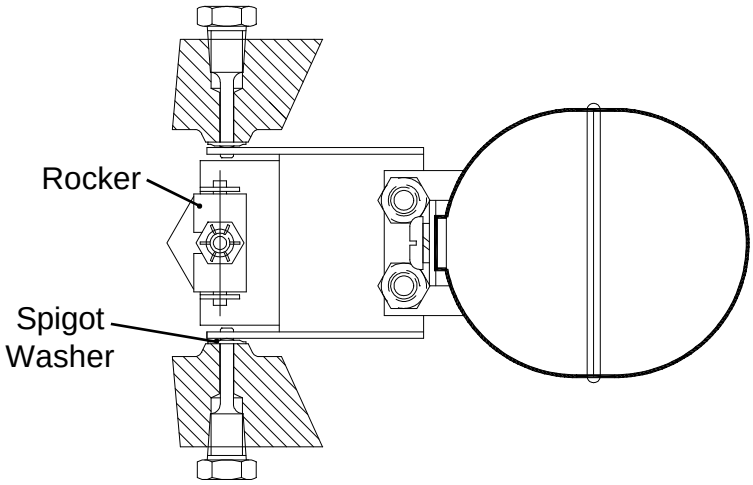


Fig.10

vi. Alignment

It is important that the bimetal is in correct alignment to the valve orifice to ensure the bimetal force acts along the axis of the valve stem . To assist with this, an alignment bar locating orifice, bimetal slot and rocker plate, is available. See tool part numbers.
Ensure the stop fitted to the float assembly is not bent or damaged. When resting on the inside of the cover the bimetal should be at right angles to the axis of the valve orifice.
Pass the liner bar through the orifice to locate in the centre of the rocker plate fig. 11. If the orifice is smaller than 0.281 ins. Dia (7.14mm) the liner bar must be inserted from above through the rocker plate. Using a screw driver it may be necessary to bend one or both of the Float holder arms to ensure correct alignment. It is important that when bimetal and orifice are in alignment, both arms are in contact with the washers to prevent any lateral movement, but ensuring full and free vertical movement of the float fig. 10.
The rocker plate must also be fitted into its holder so there is free rotational movement but no lateral movement.Lateral movement by the bimetal can cause misalignment and in extreme cases prevent correct operation of the trap.

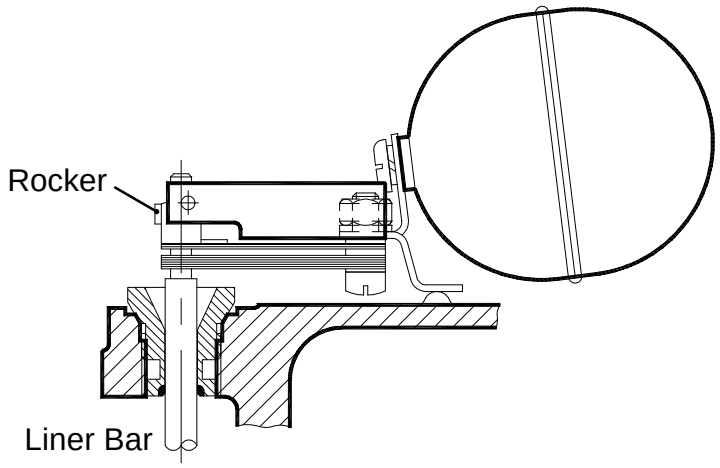


Fig.11

vii. Adjustment

When alignment is complete, replace valve through valve seat and fit the self-locking adjusting nut. Reset the clearance as detailed in section 3 b.

Relocate strainer into recess in the body, and replace cover using a new gasket. Tighten cover bolts evenly and diagonally. The Table next page indicates maximum bolting torque.

TORQUE

MODEL	COVERS	
	Ft.lb	Nm
MFT-0	19	26
MFT-1	19	26
MFT-2	45	61
MFT-3	45	61
MFT-4	93	126

5. TOOL PART NUMBERS

MODEL	STEM KEY	SETTING GAUGE	LINER BAR
MFT 0/1/2/3/4	L99001	L99005/B1	L99009-7/32
			L99010-1/4
			L99011-5/16
			L99012-3/8
			L99013-7/16
			L99014-1/2
			L99016-5/8
			L99017-3/4

APPENDIX 1 - MONOVALVE FLOAT TRAPTYPE MFA

For dis-assembly and re-assembly see section relating to maintenance for MFT Steam Traps.

Velan Float Traps, type MFA are designed automatically to re-move accumulated water from compressed air systems. The construction is similar to the steam trap type MFT except that no thermostatic element is used. A boss is provided on top of the cover, tapped for a 3/8" air circulating line. This connection is necessary to allow trap function, except in cases where it is installed directly under the drain point and so closely connected that the air entering the trap can find its way back through the inlet connection trap – (Fig 7) P.20

1. INSTALLATION

In an air main or receiver water which has separated out forms a film very much as in a pipe This can be removed as in steam trapping, by a closed float trap, but the drainage point must be carefully chosen, so that the water can easily reach the trap. Fig 1 and 2 show a main being drained at a point where it rises, which is standard steam trapping practice, but if some types of trap can air lock on a steam line, how much more likely they are to lock air on an air line. The fitting of an air vent does not cure this trouble. For water to flow into a trap on a compressed air system, it must be able to displace the air in the body of the trap. This calls for a balance pipe , taken from the top of the trap back to the air system above any possible water level. Fig 3 shows a Velan Float Trap draining a compressed air receiver, properly fitted up with a balance pipe.

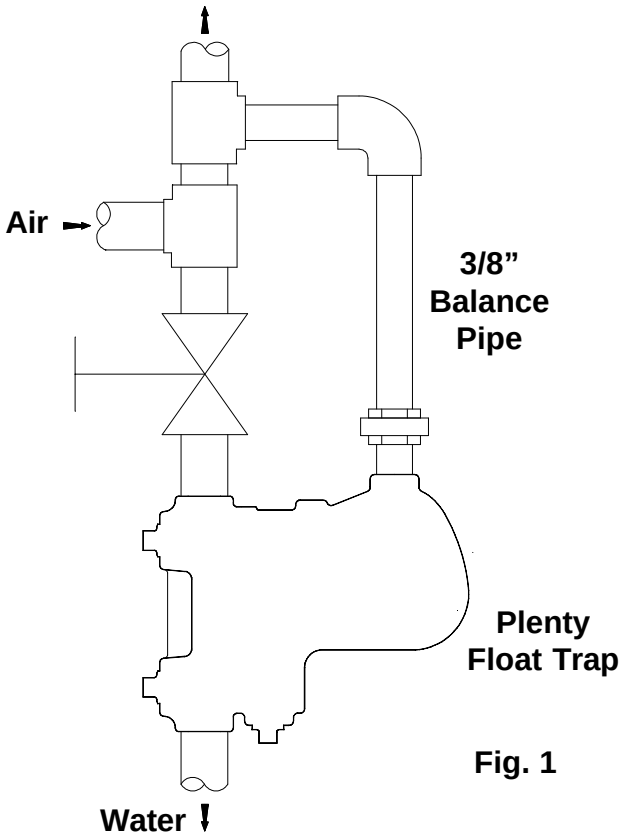


Fig. 1

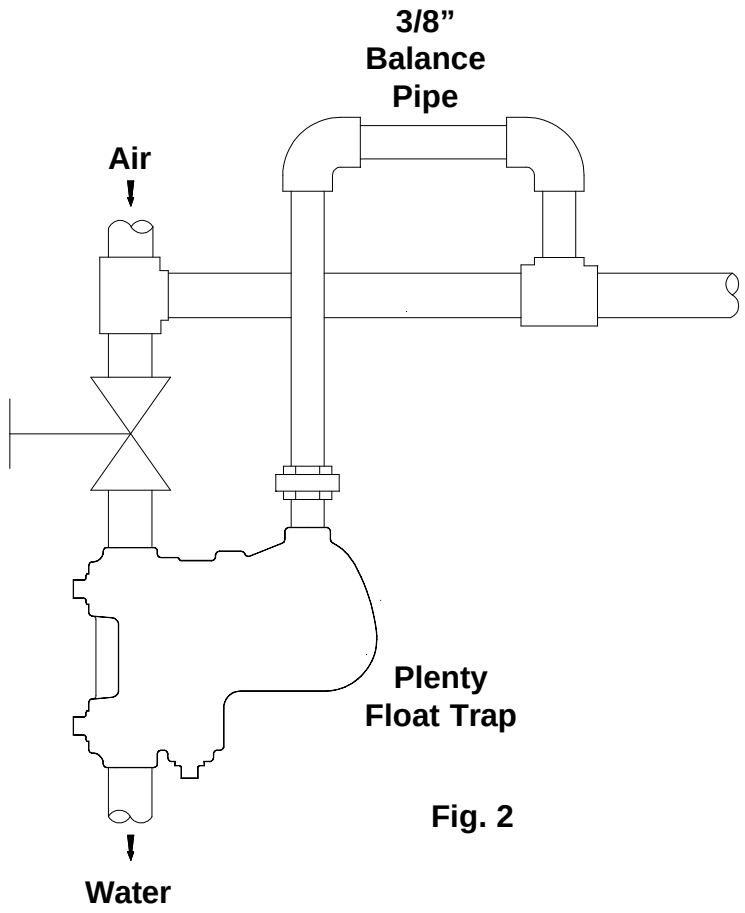


Fig. 2

Some air compressors allow oil to pass into the air line, this oil may collect dirt from the line and when mixed with water is difficult to handle and apt to cause trouble in the drain trap and the air using equipment.

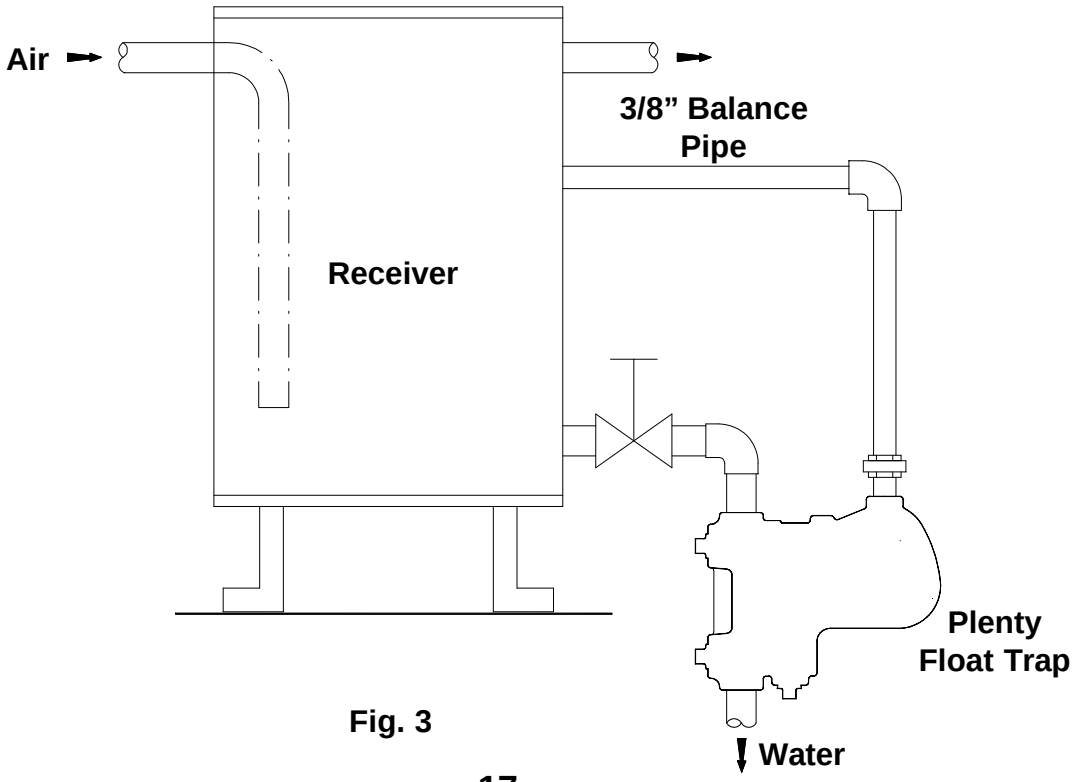


Fig. 3

Fig 4 shows how this oil can be removed from a receiver. The water connection to the trap is taken from the bottom of the receiver where cleanest water is.,A drain valve is fitted at a higher level from which the oil and scum can be run at intervals.

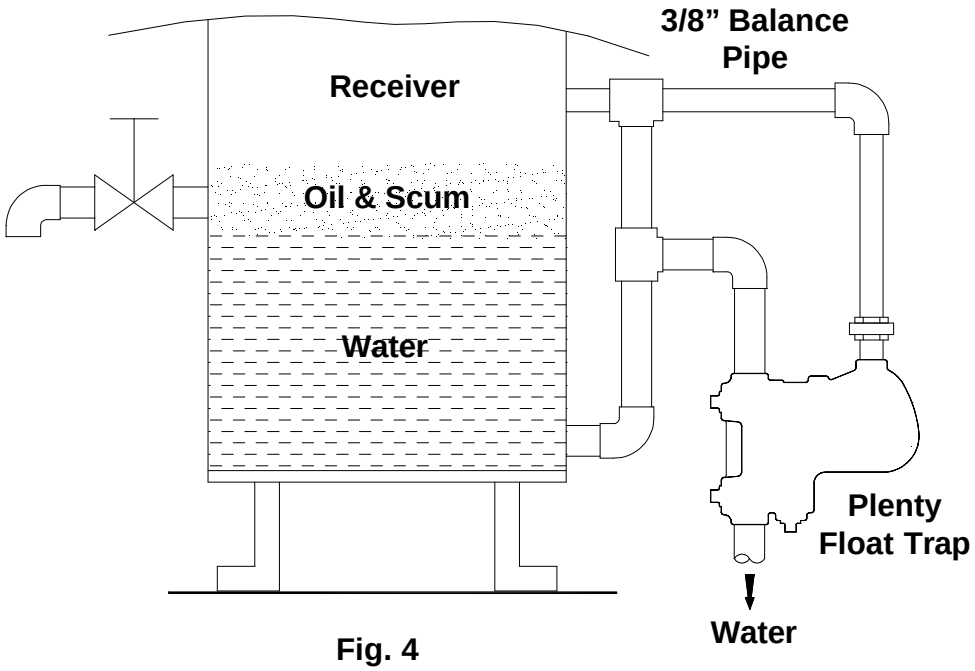


Fig. 4

The complete drying of compressed air for spray guns is a much more difficult problem, for in this case the water particles in the air must be removed. It may be sufficient to fit an air separator in the main, just as a steam separator is fitted to improve steam quality. An air separator works in the same way as a steam separator, the water particles being removed because their density is greater than the air which carries them. The separator should be drained as shown in Fig 5.

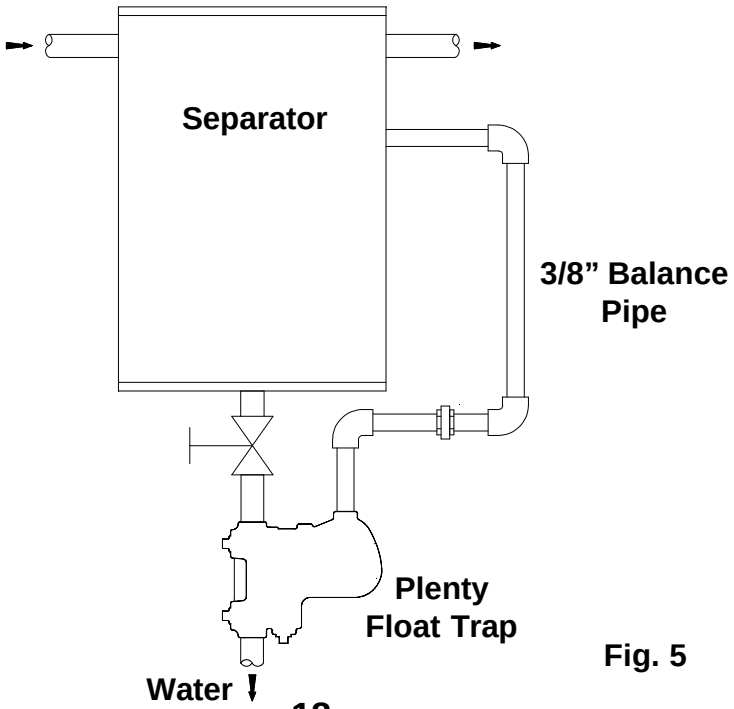


Fig. 5

On some applications it may be possible to use the Velan Float trap itself as a simple separator, if it is fitted as shown in Fig. 6.

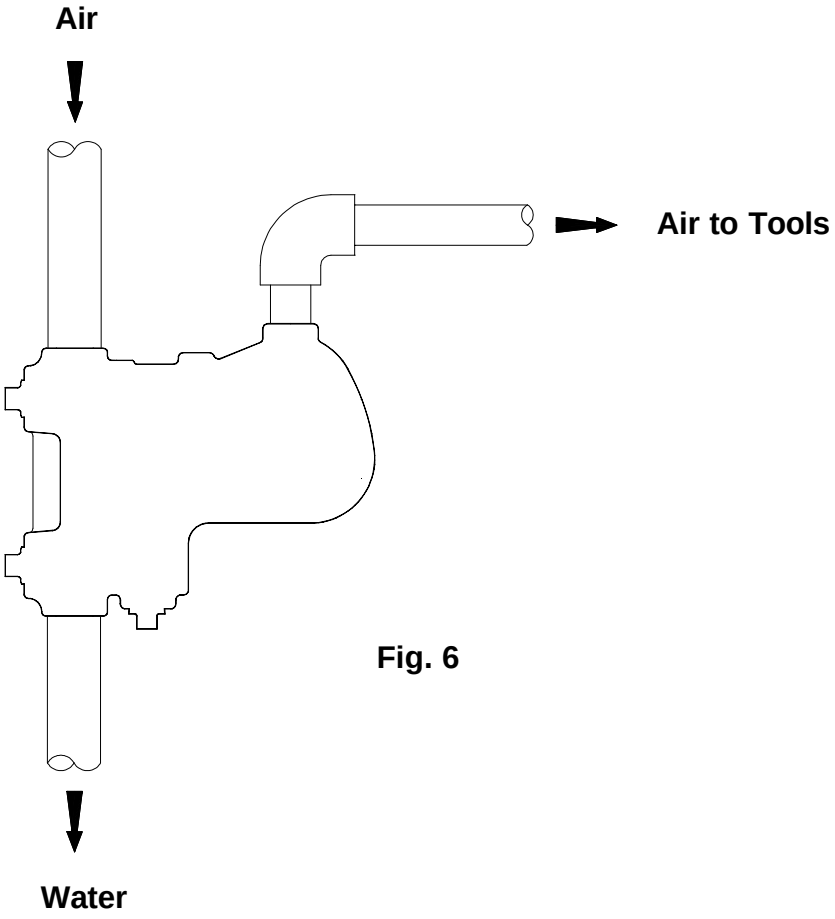


Fig. 6

2. OPERATION

Unlike the MFT used for the draining steam systems, the float in the air trap opens and closes the valve, through a stainless steel plate which replaces the bimetal element in the float assembly. Because the valve orifice is at the bottom of the cover it is self-draining when the valve is open, and does not therefore carry a reservoir of water, providing protection against freezing.

In the event if excess pressure build up in the system. The downstream valve acts as relief valve dissipating the excess pressure without damage to the intervals.

3. SETTING

When the trap is empty the float will lie with its stop resting on the cover. The S.S plate will be perpendicular to the axis of the valve stem. The adjusting nut is tightened to make contact with the plate, holding the valve in leak-tight contact with the valve seat. Do not over tighten to cause deflection of the plate.

The setting of the adjusting nut, and alignment of the plate/float assembly is as described for MFT traps, section 4(vi), using the same stem key and liner bar.

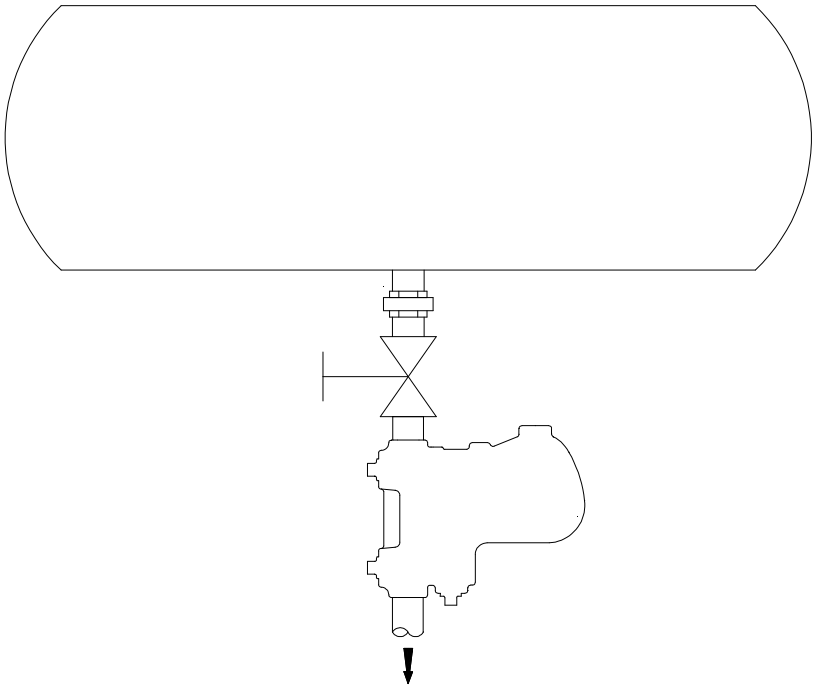


Fig. 7