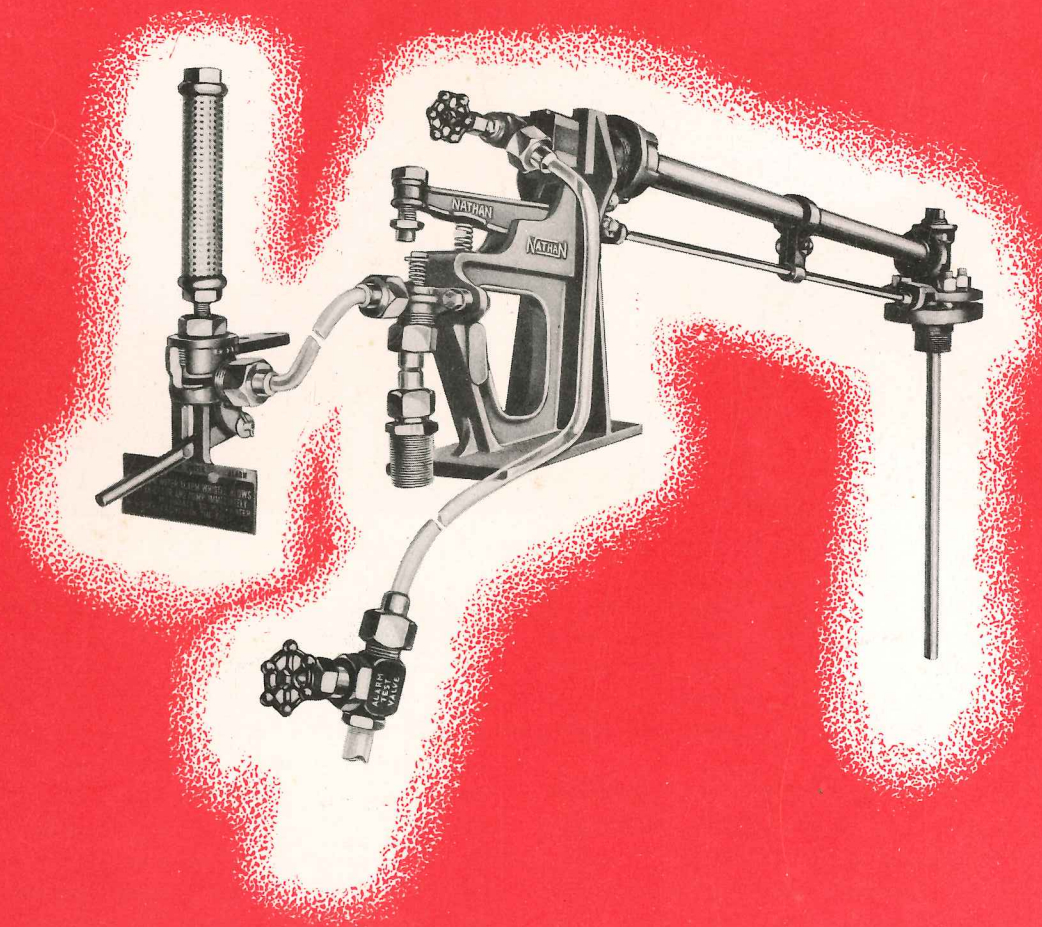


# NATHAN

## LOW WATER ALARM TYPE B



Whenever water in the boiler falls to a predetermined low level, this dependable safety device blows a whistle to warn the crew in ample time to restore the normal water level.

**NATHAN MANUFACTURING COMPANY**

416 EAST 106TH STREET • NEW YORK 29, NEW YORK  
80 EAST JACKSON BLVD. • CHICAGO 4, ILL.



*Established 1864*



**LOW WATER ALARM****TYPE B**

The NATHAN Low Water Alarm has definitely established its dependability by safeguarding several thousand locomotives over a period of many years. The engine crew can rely on it to indicate the low level of water in the boiler in ample time to prevent damage. The few moving parts of the NATHAN Low Water Alarm are of rugged design and easily inspected.

The expansion of a sturdy copper tube, long enough to transmit ample movement to a lever actuating a whistle valve, operates the NATHAN Low Water Alarm. When a copper tube is heated it expands considerably. The force generated by this expansion is so great that positive action must result. This arrangement is many times as powerful as any device depending on the buoyancy or weight of the actuating mechanism. The location of the drop pipe over the highest point of the crown sheet for a predetermined minimum water level assures a clearly audible signal whenever the water falls below that level.

The alarm mechanism and the steam whistle valve are separately connected directly to the boiler. There are no valves or cut-off cocks which could be left closed to interfere with the action of the alarm.

The alarm will operate despite any leakage which might develop in the system. On the contrary, any appreciable leakage will operate the alarm, an additional safety factor.

The NATHAN Low Water Alarm has few parts subject to wear or deterioration. Maintenance expense is negligible.

**Operation**

Under normal conditions the water level in the boiler will be above the lower end of the drop pipe "B." With boiler under steam, the steam present in the drop pipe "B" and expansion tube "C" will condense and fill these parts with water drawn up from the boiler.

As long as this condition exists, contact stud "J" on the end of lever "F" will be free from and held above the whistle valve "E."

When the water level drops below the lower end of drop pipe "B," the water in the drop pipe and in the expansion tube will be discharged, and these parts will instantly fill with steam. The difference in temperature between the water and steam causes the expansion tube to expand, causing contact stud "J" on the end of the lever "F" to press down the stem of the whistle valve "E," and admit steam through the pipe "K" and whistle valve "E" to blow whistle "G," giving a warning signal.

When the normal water level in the boiler has been restored, the lower end of the drop pipe will again be below the water level in the boiler. The

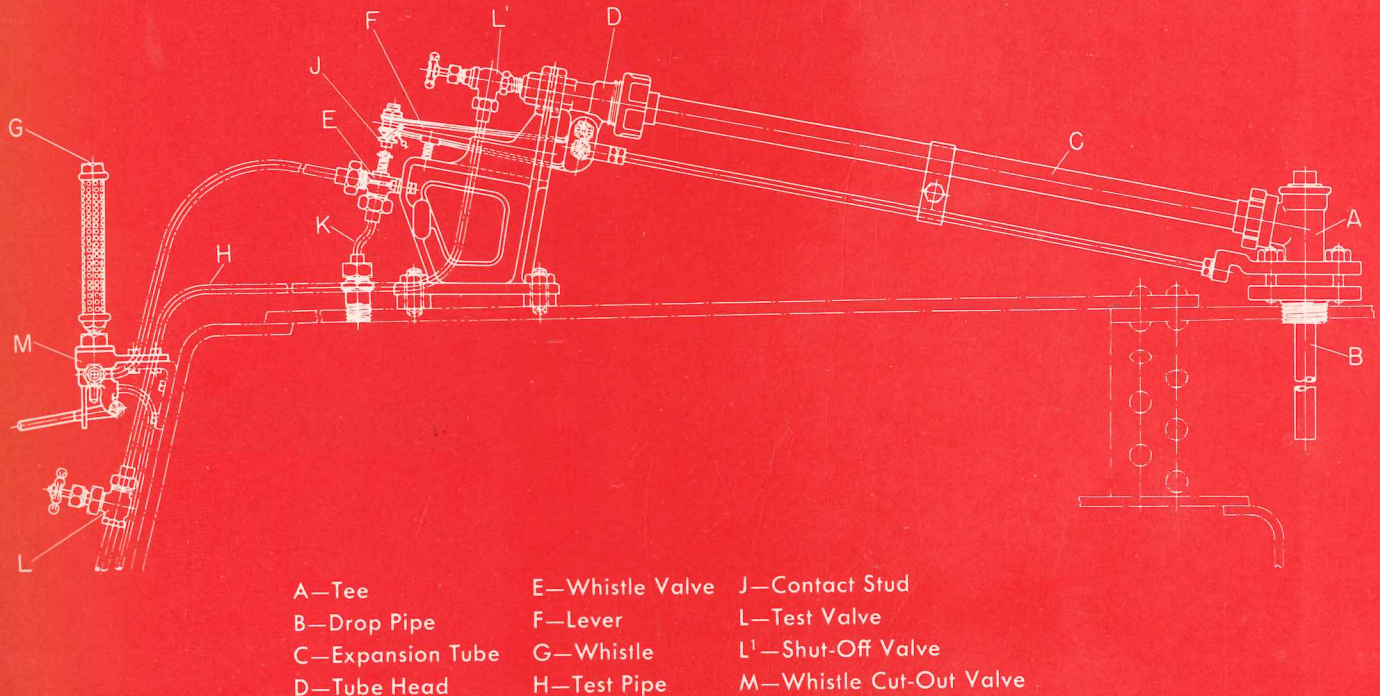
steam in the drop pipe and expansion tube will again condense and fill these parts with water, causing expansion tube "C" to contract and lift lever "F" and contact stud "J" away from the whistle valve "E." This closes the whistle valve and restores the alarm to its normal condition.

In a device of this character, it is necessary to know at all times that every part of the mechanism is in perfect operative condition. The test valve "L" is provided for this purpose, and should be located on the back-head of the boiler, convenient for operation. Opening this valve causes the chilled water in the expansion tube to be blown out, and replaced by water of a higher temperature from the boiler. The difference in temperature causes the expansion tube to expand and the alarm to function, thus ascertaining its operative condition.

The shut-off valve "L" is to be kept fully open, and should be closed only in case it becomes necessary to grind in or otherwise repair test valve "L" with boiler under steam.



## LOW WATER ALARM TYPE B



The Type B Alarm is furnished with its whistle mounted inside the cab. The Whistle Cut-Out Valve, Type 3241, illustrated on page 5, reduces the sound of the whistle while blowing down an engine.

### Application and Adjustment

The alarm is to be set up in the desired position on the boiler and the tee "A" secured in place. The frame should be so located as to provide for the desired slope of the expansion tube, that is 2" in 12" with the engine on a level track. Locate frame so that the center line of the Whistle Valve "E" is in line with the center line of the contact stud "J". Final adjustment between the valve stem and the contact stud "J" should not be made until

full boiler pressure has been developed, when the gap should be adjusted to  $\frac{1}{8}$ ".

After testing the alarm system, if further adjustment between contact stud and valve stem be necessary, it should not be made until the temperature of the expansion tube has become normal.

The steam pipe to the whistle valve should slope, to provide for drainage back to the boiler.

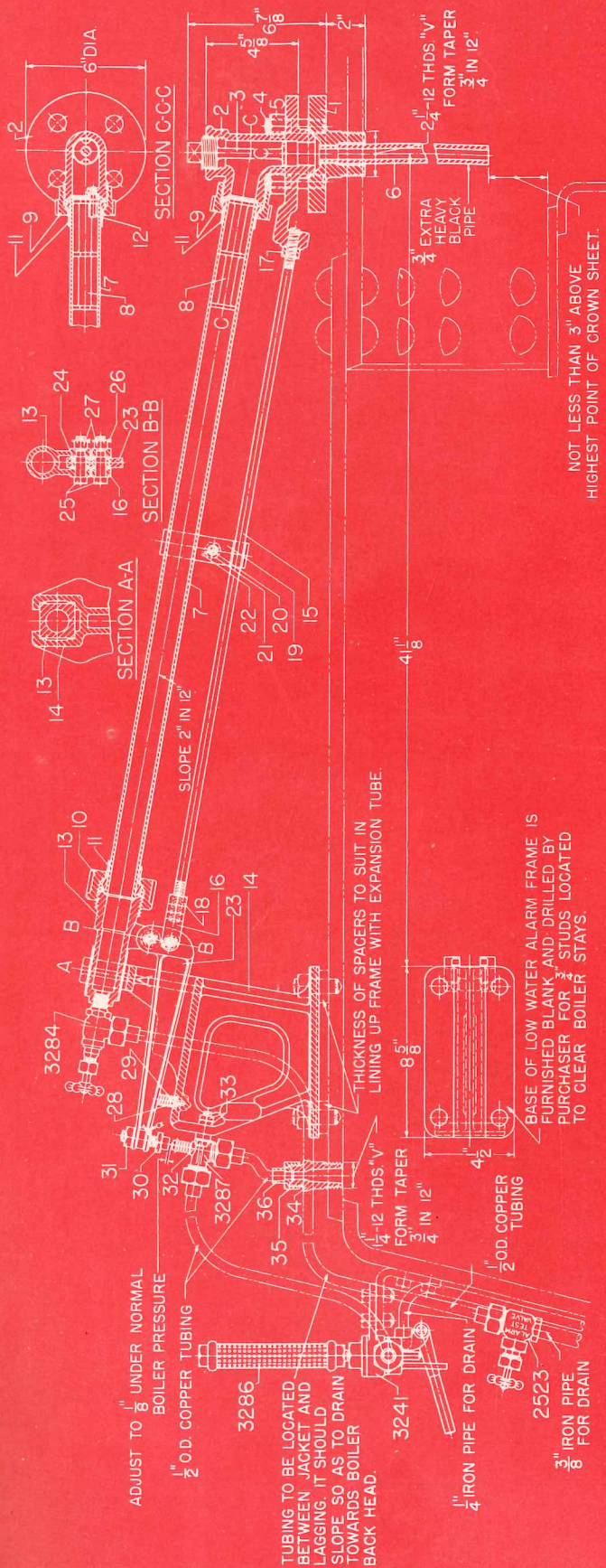
### Cleaning

At regular boiler inspection, the tee-baffle in line with the drop pipe should be removed and a  $\frac{3}{4}$ " diameter rod run through the drop pipe to insure against accumulation of scale.



## LOW WATER ALARM

### TYPE B



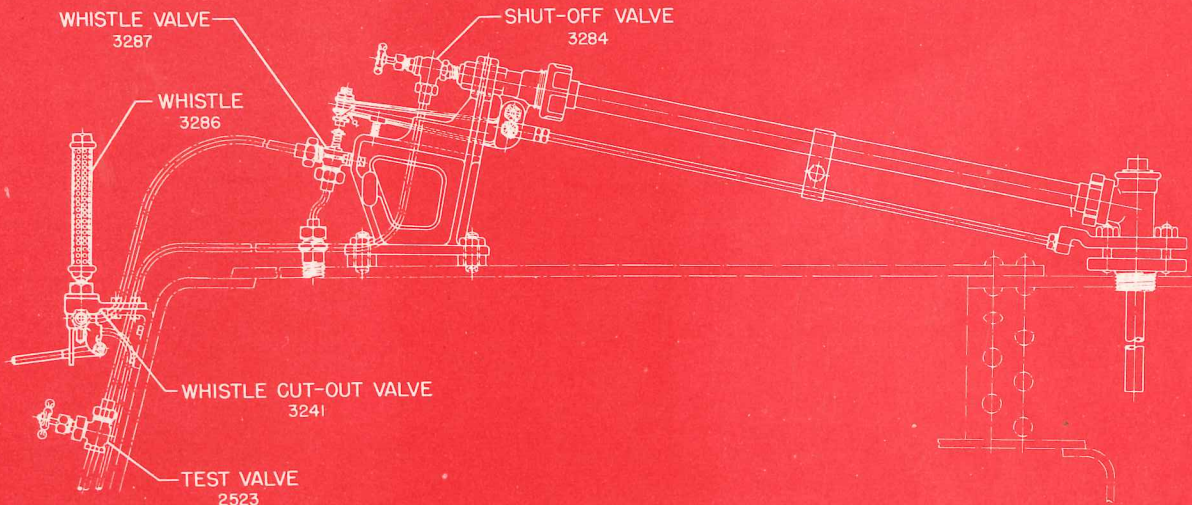
PATENT NO. 1,900,379

Drawing Identification	Name of Part	Shop Number	Drawing Identification	Name of Part	Shop Number
1	Flange	R-20775	14	Frame	R-20770
2	Tee	R-20774	15	Reach rod	R-20750
3	Tee baffle	R-20756	16	Reach rod yoke	R-20751
4	Stud	R-20777	17	Reach rod lock nut (R.H.)	G-164
5	Stud nut	H-10341	18	Reach rod lock nut (L.H.)	R-20773
6	Drop pipe	R-20758	19	Reach rod clamp	R-20752
7	Expansion tube	R-20763	20	Reach rod clamp bolt	R-20753
8	Expansion tube baffle	R-20710	21	Reach rod clamp bolt nut	R-20754
9	Coupling nut (tee end)	R-20713	22	Reach rod clamp bolt cotter pin	31474
10	Coupling nut (tube head end)	R-20767	23	Lever	R-20771
11	Collar	R-20716	24	Lever bushing	R-20772
	*Expansion tube complete sub-assembly	DG50794	25	Lever pivot bolt	R-20748
12	Locating pin for tube baffle	R-20764	26	Lever pivot bolt cotter pin	D-172
13	Tube head	R-20769	27	Lever pivot bolt nut	R-20749
			28	Lever spring	R-20745
			29	Lever spring screw	R-20760
			30	Contact stud	R-20707
			31	Contact stud nut	R-20708
			32	Whistle valve support bolt	R-20725
			33	Whistle valve support bolt lock nut	38893
			34	Steam connection	R-20726
			35	Steam connection coupling nut	R-20719
			36	Steam connection tailpiece 1/2" o.d. C.P.	R-20720
			2523	Test valve	see page 6
			3284	Shut-off valve	see page 6
			3286	Whistle	see page 7
			3287	Whistle valve	see page 7
			3241	Whistle cut-out valve	see page 5

\*Pertains to parts 7 through 11.



## SUB-ASSEMBLED UNITS AND LISTS OF PARTS



### ORDERING INSTRUCTIONS

In ordering parts, use names and shop numbers—or sub-assembly numbers if to be ordered assembled. **To order a Low Water Alarm, Type B, complete with all accessories as shown, use:**

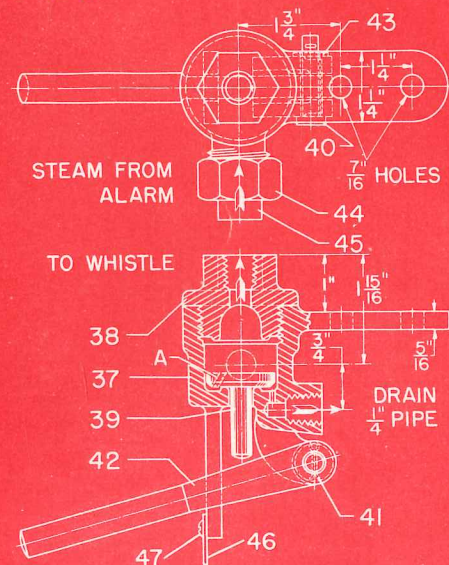
Assembly No. DG 51278

### WHISTLE CUT-OUT VALVE, TYPE 3241

This valve is supplied with the NATHAN Low Water Alarm to reduce the sound of the whistle while blowing down an engine. To operate the valve push the lever 42 up to seat the piston 39 against the cap 38, permitting only a small amount of steam to pass into the whistle through the port A in the disc of the piston.

Lack of steam pressure or increase of the water level in the boiler makes the alarm inoperative. When the steam pressure below piston 39 is removed, the piston drops to its lower seat by gravity. This automatically restores the cut-out valve to its normal position.

The cut-out valve must be mounted in a vertical position. A preferred method of application is shown in the illustration above.



Drawing Identification	Name of Part	Shop Number
37	Body	41648
38	Cap	41649
39	Piston	41650
40	Fulcrum pin	41651
41	Cotter pin	N-714
42	Operating lever	41652

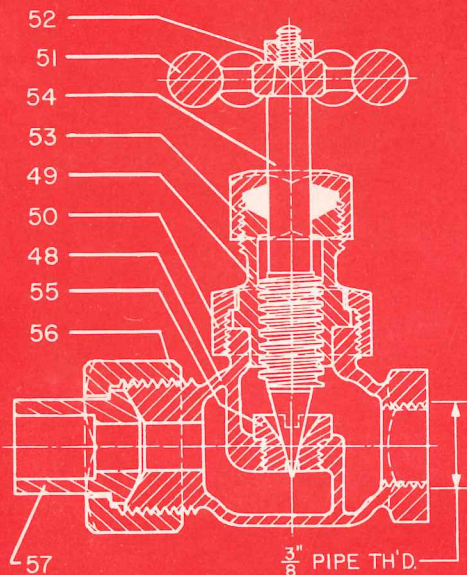
Drawing Identification	Name of Part	Shop Number
43	Washer	41653
44	Coupling nut	R-20719
45	Tailpiece 1/2" o.d. C.P.	R-20720
46	Instruction plate	R-20828
47	Instruction plate screw	D-20969

Complete sub-assembly DG 51270



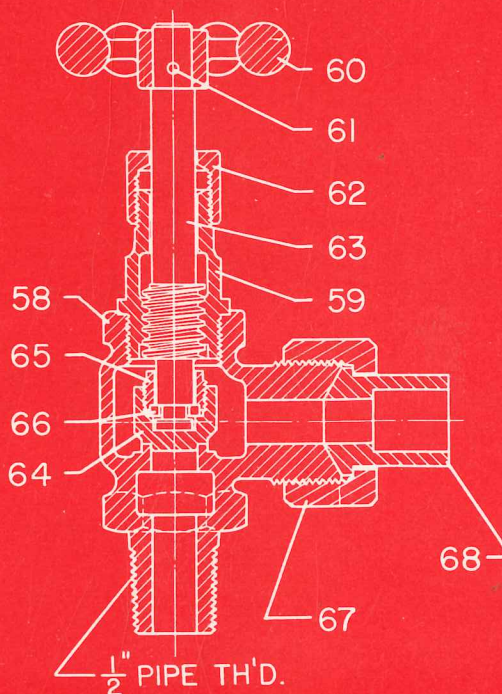
## SUB-ASSEMBLED UNITS AND LISTS OF PARTS

TEST VALVE, TYPE 2523



The Test Valve is used to check the operation of the Low Water Alarm. When the valve is opened, the chilled water in the expansion tube is blown out and replaced by hotter water from the boiler. The resulting increase in temperature causes the expansion tube to expand and the alarm to function.

SHUT-OFF VALVE, TYPE 3284



This valve is mounted between the Test Valve and the expansion tube. It should be kept open at all times and closed only when re-grinding or otherwise repairing the Test Valve with boiler under steam.

**Drawing Identification**

**Name of Part**

**Shop Number**

48	Body	R-20790
49	Bonnet	C-25004
50	Bonnet nut	C-25014
51	Handwheel	B-25010
52	Handwheel nut	B-25015
53	Packing nut	C-25006
54	Spindle	R-20791
55	Seat	R-20792
56	Coupling nut	R-20719
57	Tailpiece 1/2" o.d. C.P.	R-20720

Complete sub-assembly DG 51081

**Drawing Identification**

**Name of Part**

**Shop Number**

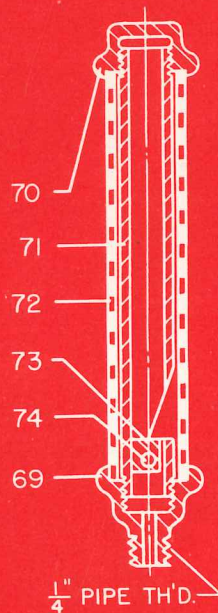
58	Body	R-20815
59	Bonnet	C-25075
60	Handwheel	C-25076
61	Handwheel pin	B-25077
62	Packing nut	C-25078
63	Spindle	C-25079
64	Disc	C-25080
65	Disc nut	C-25081
66	Disc collar	C-25082
67	Coupling nut	R-20719
68	Tailpiece 1/2" o.d. C.P.	R-20720

Complete sub-assembly DG 51455



## SUB-ASSEMBLED UNITS AND LISTS OF PARTS

### WHISTLE, TYPE 3286

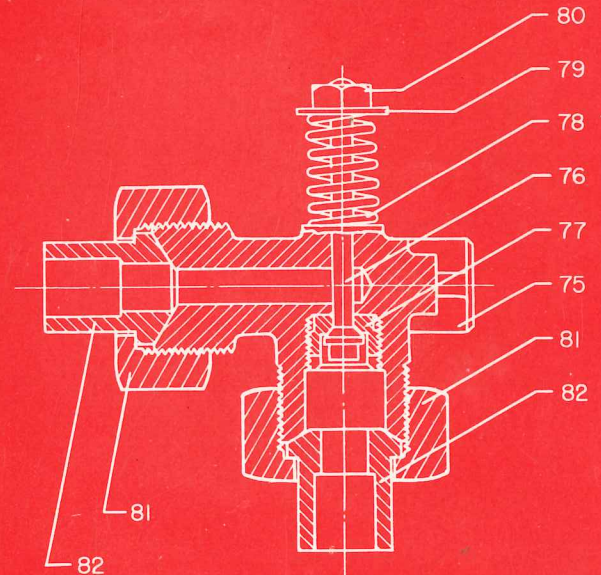


This whistle supplies an audible signal of a dangerously low water level in the boiler.

Drawing Identification	Name of Part	Shop Number
69	Base	R-20727
70	Cap	R-20728
71	Bell	R-20729
72	Shield	R-20730
73	Plug	R-20731
74	Pin	R-20732

Complete sub-assembly DG 50289

### WHISTLE VALVE, TYPE 3287



The opening of this valve sounds the whistle. It is operated by movement of the expansion tube transmitted through the lever pivoted on the tube head. As soon as the normal water level in the boiler has been restored, the valve closes.

Drawing Identification	Name of Part	Shop Number
75	Body	R-20737
76	Valve	R-20721
77	Seat	R-20738
78	Spring	R-20722
79	Washer	R-20723
80	Nut	R-20724
81	Coupling nut	R-20719
82	Tailpiece 1/2" o.d. C.P.	R-20720

Complete sub-assembly DG 51281



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TRADE

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**416 East 106th Street, New York 29, N. Y.**

Established 1864