Standard with STEAM USERS SINCE '94

WRIGHT-AUSTIN

STEAM TRAPS
AIR ELIMINATORS
STRAINERS

BULLETIN NO. 21

TO HELP YOU select the correct steam trap for each particular service, this bulletin will be of valuable assistance.

Because steam traps must be suitable

for draining so many different kinds and types of equipment—

under a wide range of pressures—

along with numerous other variations in actual service,

it is self-evident that no one single type of steam trap can be an "all purpose trap," and serve all conditions efficiently, any more than one type of valve can be an "all-purpose valve."

In the selection of a steam trap, one must consider the capacity, the pressure, the service, and the kind of equipment to be drained. Unless these demands are thoughtfully considered, maximum efficiency of operation cannot be secured and unnecessary loss in operation costs is bound to result.

To obtain anything like the highest efficiency from the equipment to be drained, each particular requirement must be served by a type and size of steam trap which is suitable for the service.

Accordingly, as a trap is suited to the service, profits are increased or decreased on the larger equipment, the heating output of which the little trap exercises an important, and in some cases, nearly absolute control.

On the following pages will be found a Wright-Austin Steam Trap that will be correctly suited for each particular requirement of non-return service.

Having been established nearly fifty years, you may receive for the asking, experienced counsel on steam drainage.

WRIGHT AUSTIN

WRIGHT-AUSTIN COMPANY

Main Office

315 West Woodbridge Street, Detroit, Mich.

Representatives and Distributors in Principal Centers

CABLE ADDRESS, RITEAUSTIN, DETROIT, WESTERN UNION CODE

MANUFACTURERS OF

Steam Separators
Oil Separators
Gas Separators
Air Separators
Exhaust Heads

Steam Traps
Grease Traps
Gasoline Traps
Compressed Air Traps
Air Relief Traps
Air Vents
Strainers

Alarm Water Columns
Try-Cocks
Water Gauges
Safety Protector for Gauge Glasses
Gauge Glass Illuminators
Automatic Feed Water Regulators
Pump Governors
Boiler Feeders

TELEGRAPHIC CODE WORDS

Telegrams and Letters

Retel —Replying to your telegram of
Relet —Replying to your letter of
Action —Answer immediately by telegraph
Affirm —Answer full details by letter
Airway —Answer by return air mail

To Factory—Inquiries and Orders

Pricer —What is lowest price and earliest shipment?
Sooner —How soon can you ship?
Router —Ship by cheapest route
Freighter —Ship by freight
Trucker —Ship by motor truck
Boater —Ship by boat
Expressor —Ship by express
Poster —Ship by parcel post insured
Flight —Ship by airplane
Advisor —Advise by letter if you can ship as directed
Director —If you cannot ship as directed, how soon and in what manner can you make shipment?
Instructor —Await our instructions before making shipment
Follower —Shipping instructions to follow
Tracer —Put tracer after shipment

From Factory—Quotations and Shipments

Concrete —Price net to you FOB Detroit, Mich.
Stocker —Can ship at once from stock
Unfold —Can ship within.....days
Onefold —Can ship within one week
Twofold —Can ship within two weeks
Threefold —Can ship within three weeks
Fourfold —Can ship within four weeks
Folder —Can ship within.....weeks
Traffic —Freight rate per hundred pounds quoted us from Detroit to destination city
Informer —Need further information about.....
Holding —Holding order.....for shipping instructions

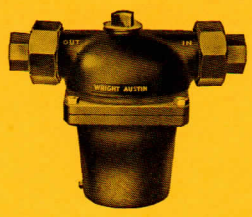
CODE WORDS FOR PRESSURE

Polka	5 lbs.	Prime	200 lbs.
Point	10 lbs.	Power	225 lbs.
Podge	15 lbs.	Punch	250 lbs.
Posey	20 lbs.	Plimp	275 lbs.
Poorl	50 lbs.	Plots	300 lbs.
Porch	75 lbs.	Phram	350 lbs.
Plumb	100 lbs.	Phlit	400 lbs.
Pence	110 lbs.	Phads	450 lbs.
Poker	125 lbs.	Photo	500 lbs.
Plane	150 lbs.	Phirn	600 lbs.
Pivot	175 lbs.	Potent	650 lbs.

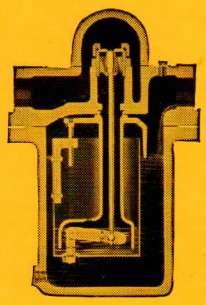
Additional Code Words for the different products are used throughout this book.
See Index of all Code Words in this book on page 247.

Send for General Catalog

THE MOST COMPLETE LINE OF STEAM TRAPS

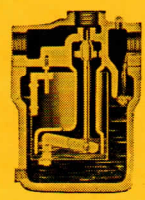


"Airxpel" Cub Type with Unions, Page 206

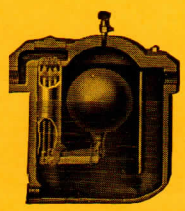


"Airxpel" Master Type, Page 210

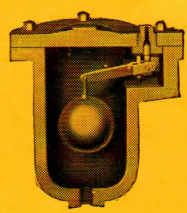
"Airxpel" Steel Trap for High Pressures, Page 214



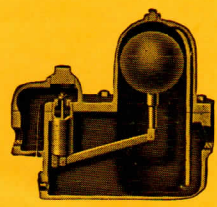
"Airxpel" Cub Type without Unions, Page 206



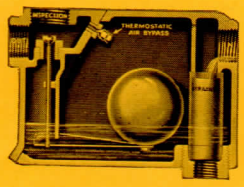
"Emergency" Float Type, Page 228



Air Relief Trap, Page 236



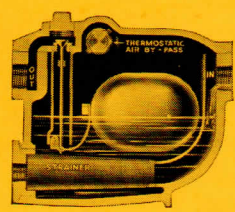
"Victor" Float Type, Page 224



"Combination" Float & Thermostatic Type, Page 222

Traps for Draining Oil Separators, Page 233

Traps for Draining Compressed Air, Page 234



"Combination" Float & Thermostatic Type, Page 220

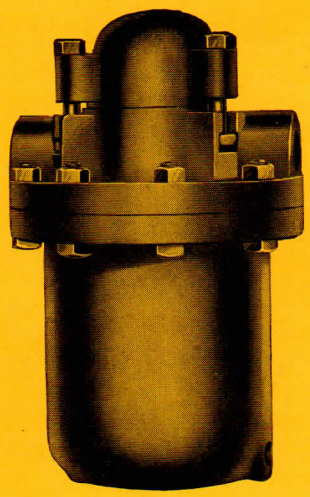
By manufacturing several kinds of traps for different conditions, a type and size for the highest efficiency may easily be selected from the large Wright-Austin line.

Greatly improved operating results and efficiency can always be obtained, and steam saved, by being sure to have the correct steam trap on every installation.

Examine the different types carefully, and if desired, our suggestions will be cheerfully given, either direct from the Factory or through our nearest Representative.

WRIGHT-AUSTIN "AIRXPEL" VERTICAL BUCKET STEAM TRAPS

(Patented)



"Master" type

"Steel" type

DISTINCTIVE FEATURES OF THE "AIRXPEL" STEAM TRAPS

1. Horizontal straightline inlet and outlet pipe connections, for easy and economical installation. No additional pipe fittings to purchase.

2. Has its own internal water seal, self-contained inside of Trap—no special water seal piping needed.

3. Unions are furnished without extra cost on the inlet and outlet connections of the three smallest sizes.

4. Valves are accessible from outside of Trap and changeable for different pressures, without any adjustments whatever.

5. Reversible, double-sided valve and seat in the Master Trap, giving "double life" of service.

6. Master Trap has spiral vanes on valve holder which revolves valve at each discharge—continuously regrinding the valve, and keeping the Trap steam tight longer.

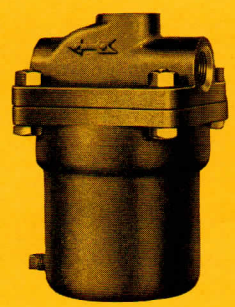
7. Blow-off connection on all Traps to keep Trap flushed clean, which reduces wear and prolongs the life of valve and seat.

8. Small compact size, light in weight so the Trap may be hung in the pipe line like an ordinary straightway valve.

9. By unbolting and dropping off the body of Trap, the inside working parts are all exposed, and easily accessible for inspection or removal, without disturbing the pipe connections.

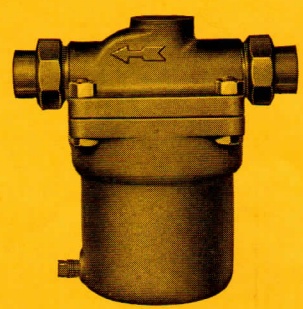
10. Simple, rugged design, eliminating as many moving parts as possible, no elaborate linkages to wear out.

11. Every "Airxpel" Steam Trap is tested and operated under actual steam working conditions at the factory.



"Cub" type with screwed connections

Cub Type "Airxpel"
Bucket Steam Trap



"Cub" type with union connections

"AIRXPEL" VERTICAL BUCKET STEAM TRAPS

General Description

High quality modern steam traps in every way, the "Airxpel" Bucket Traps embody new and exclusive patented features. They are correctly engineered and sturdily built for long continuous and dependable service. They are "double duty" Traps because they discharge both air and condensate.

To meet the many differing requirements of service "Airxpel" Traps are made in three groups of sizes, known as the "Cub", "Master" and "Steel" patterns. Detailed description is contained on the following pages.

All "Airxpel" Traps are made with horizontal straight line pipe connections for easy and low cost installation. They have a complete water seal within the trap; there is no extra expense for fittings or special water seal piping.

They are the result of many years of experience and research. The effort has been to produce a modern Steam Trap which would have as many of the advantages of existing types, with as few faults as possible, and which at the same time, would incorporate a number of new and distinctive features.

All parts are designed for ample strength and durability, but with the greatest possible simplicity and least weight. Being small and compact they fit into a straight-through pipe line like an ordinary valve, and seldom need any support base.

Only the highest grade of material is used, which our long experience has proven as best suited for each particular part.

Each and every Trap is individually tested under actual steam operating service, in addition to a hydrostatic pressure test, and is fully guaranteed.

The Internal Water Seal Is Simple

The water seal which prevents waste of steam, is self-contained entirely within the "Airxpel" Trap itself. No part of the water seal is external or held in the piping outside of the Trap. Each Trap is complete ready for operation as delivered. There is no additional piping or fittings needed to provide a water seal.

Self-Cleaning

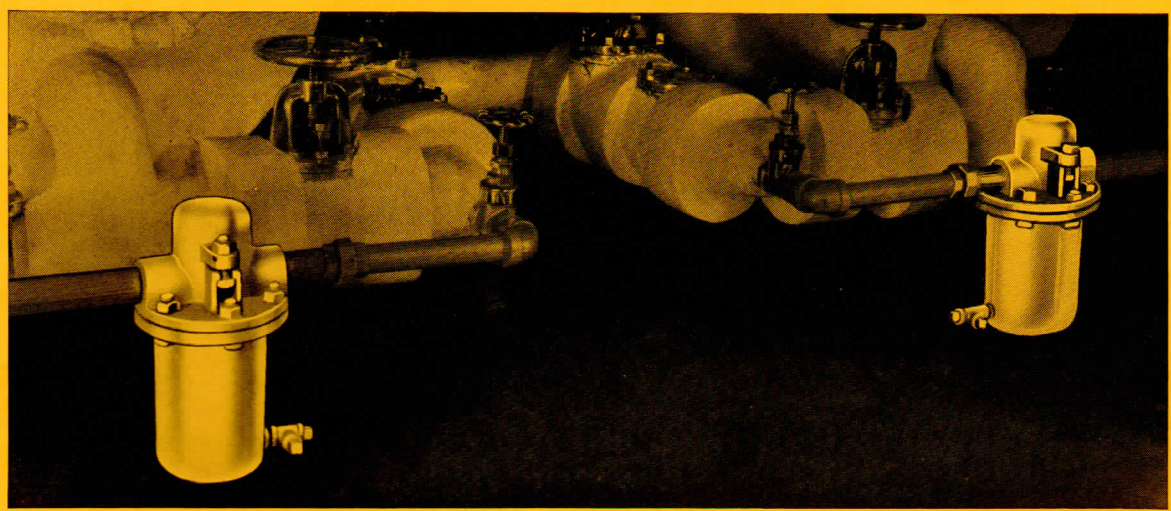
"Airxpel" Steam Traps are self-cleaning to the extent that they will easily discharge particles of foreign matter which are not too large to pass through the valve opening.

The slender cylinder shape of the bucket, also the body, and the quick opening intermittent action of the valve, combine to produce a rapid surge of condensate through the trap while it is discharging. This high velocity of the condensate rushing through the Trap carries with it the particles of foreign matter which ordinarily remain in many other types of Traps.

While the "Airxpel" Traps are not susceptible to dirt troubles, and usually remain clean indefinitely, it is recognized sometimes certain gummy substances get into Steam Traps, which are too heavy, or too sticky for the Trap to handle. Pipe thread dope, and some boiler compounds, which combine with other substances, are in this class.

However, the "Airxpel" Traps have a blow-off connection so they may be kept clean longer, by blowing out the dirt at intervals, as may be found necessary.

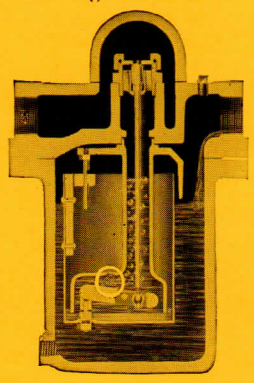
Even under the most serious conditions, when cleaning does become necessary, the "Airxpel" Trap may be opened up and cleaned by simply unbolting the body, and without disturbing either inlet or outlet pipe connections. Then by unscrewing one small nut off the bottom of the bucket, the bucket is removed. The body and bucket are easily handled, cleaned and replaced.



For more than 10 years, these two "Airxpel" Master Traps have been draining water heaters in a prominent hotel. A service that demands day and night dependability.

HOW THE "AIRXPEL" TRAP DISCHARGES AIR

The easily understood air discharging feature of the "Airxpel" Trap makes use of a very simple law of gravity, like the principle of the inverted bottle of drinking water in a cooler.



Air is sucked up into tube of Trap. Compare this with bottle below.

When water is drawn out, the submerged end of the bottle is uncovered so the air bubbles pass up the neck of the bottle as the water flows down.

In the Trap it works the same way. However, the Trap has an inverted bell tube through which the condensate is discharged, and which contains an air vent passage at the point in the circle where the bubbles start, as shown in the illustration at tbe left.

This air vent passage is above the submerged lower end of the bell tube (which formsth e water seal) and is uncovered and open to pass air up into the tube except for the very brief instant that the bucket is filling and while the Trap is actually discharging condensate.

When discharge of the condensate has taken place, and the valve is closed by the rising bucket, the discharge tube remains full of water.

This column of water in the tube, by the natural law of gravity, will seek its own level in the bottom of the bucket. But the water can only flow back into the bucket to the extent that air is drawn up to fill the space in the tube. The weight of the water in the tube creates a partial vacuum, the same as in the inverted bottle of drinking water in a cooler.

What happens is that the entrained air in the Trap is literally sucked up into the discharge tube by the weight of the descending water seeking its level in the bucket.

With the next discharge the air is forced out ahead of the water.

If there is no air in the Trap, then the column of water in the tube will stand full, up to the valve.

In the picture at the right a bottle was used for transparency. This illustration shows how the air is drawn into the bottle at the opening opposite the pointer, and rising upward in the bottle to fill the space or partial vacuum produced by the weight of the water. Air is collected in the tube of the Trap by the same unfailing natural law of gravity. At each discharge of the Trap the air goes out first.

Shows how air is actually sucked up through the water. Compare with Trap above.

Air Is Always Present in Steam

In every kind of steam heated apparatus the steam condenses as it gives up its stored heat.

By condensing, the steam returns to its original form —water. But as the steam changes from gas to liquid, the air which is mixed in with the steam remains as a gas, because it is non-condensable and cannot change to liquid.

The air will thin out and weaken the heating effect of the incoming new steam. Air will also collect in pockets, crowding out the steam, thus causing cold spots, sluggish operation and air binding.

When the steam is diluted with 10% of air by volume, the heating effect of the steam is reduced approximately 10%. This means 10% longer time to do a certain job. Practically the same ratio holds good with a greater or less amount of air in the steam. But unless promptly eliminated, the air continues to build up in volume and increase its detrimental effect of slowing down production.

Now since both condensate and air accumulate, this presents a double duty—one of removing the water as a liquid, and the other of removing the air as a gas.

The modern "double duty" feature of the "Airxpel" Traps in automatically discharging both air and condensate, increases efficiency, boosts production and reduces costs on many steam heating, drying and cooking operations.

Speeding Up Heating Operations

When steam heated equipment cools down, air will occupy most of the steam space. When steam is again turned on, the air as well as the condensate must be eliminated by the trap.

The amount of condensate the trap is required to handle usually can be calculated, but the volume of air is variable and difficult to determine, as there is no fixed proportion of air to water under these conditions.

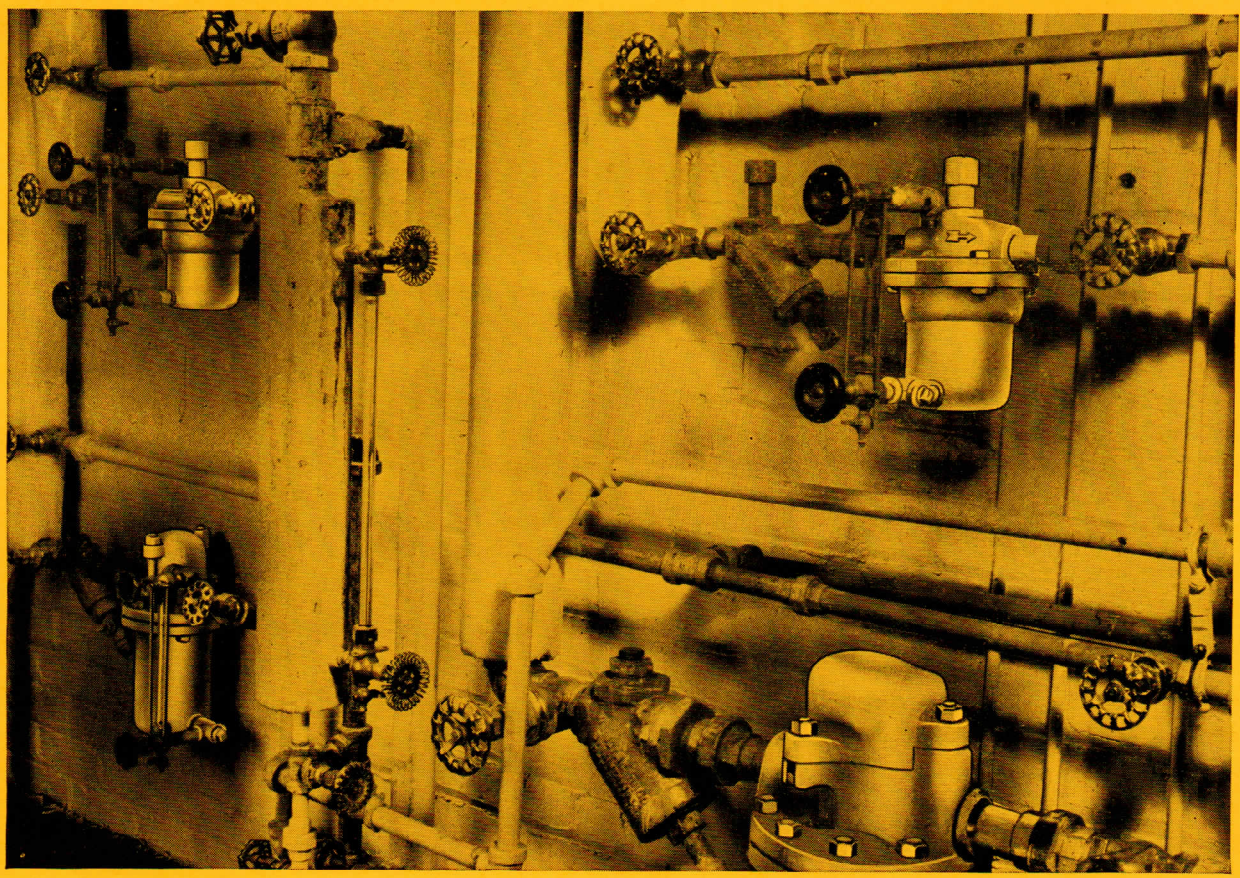
Accordingly, a trap may be selected to have ample water capacity for a certain job, yet overloaded by excess air.

Air troubles are most frequent, also most aggravating in low pressure service because the lower the pressure, the slower will be the movement of the air, as well as the condensate. The result is a sluggish elimination of the condensate, and retarded heating.

On low pressure service, or on systems having a large porportion of air, or, where it is desirable to heat up more quickly, the "Airxpel" Cub Traps may be provided with a thermostatic air control which will automatically speed up the elimination of air. This is a bimetal operated control on the bucket which causes the trap valve to remain open for the discharge of the air. This thermostatic air control is generally recommended for all traps on pressures under 10 lbs.

Sometimes the pipe lines become air locked at points distant from the trap, so that it is almost impossible for a trap to help such a condition. Correcting the piping arrangement to remove the air pockets so the air can get to the trap, or attaching air vents in the steam supply line is about the only remedy.

"AIRXPEL" VERTICAL BUCKET STEAM TRAPS



The Engineers at this plant have a very complete installation. They prefer water gauges, which are easily attached to both the Cub and Master Sizes of "Airxpel" Traps.

Wright-Austin "Tuway" Strainers are used ahead of these Traps.

No support bases are needed under "Airxpel" Traps.

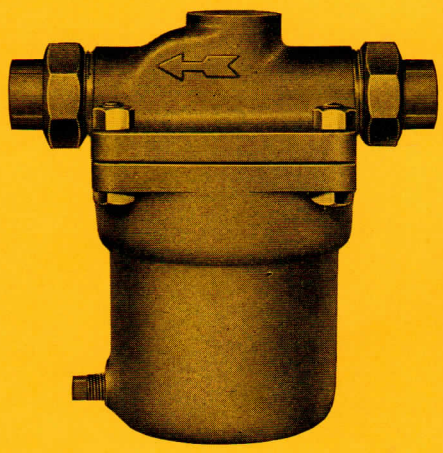
The horizontal, straightline pipe connections make a simplified piping.

Suggested Specification for Bucket Type Steam Traps

Steam traps shall be of the vertical bucket type and have ample capacity for the service. Inlet and outlet pipe connections shall be on opposite sides of the trap in a horizontal plane. Valves and seats shall be interchangeable from zero to full working steam pressure for which each trap is built, without requiring any adjustment changes, and without removing cover of trap or breaking the pipe line connections. The body of each trap shall have a blow-off opening. Traps shall have a capacity of . . . pounds of water per hour at differential pressure of . . . pounds per square inch. Steam traps shall be Wright-Austin "Airxpel" or equal.

"AIRXPEL" VERTICAL BUCKET STEAM TRAPS

"CUB" TYPE



Union Connections

Handiest of all traps to connect up. Double unions save you money on installation labor.

No Fittings to Buy

No unions, elbows, tees, or nipples needed at the Trap.

Easiest to Install

Straight-through horizontal pipe connections. Fits in the pipe line like a straight-way valve.

Your Costs Are Reduced

Because the water seal is entirely within the Trap—no outside special water seal piping is needed.

The "Cub" Traps are the medium and small sizes of the regular "Airxpel" design, and are especially suited for drainage on steam equipment used for cooking, drying, heating, laundry machinery, drips, etc.

For the many applications where a small or medium size individual Trap on each drain is desired, the several sizes of the "Cub" Traps may be used with the highest efficiency. Separate Traps on individual drains will invariably show greatly improved heating results, over the grouping of two or more drains into one larger Trap.

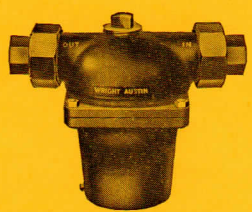
More heat from the same steam is almost certain to result from using "Airxpel" Traps, because they automatically discharge both air and condensate, and eliminate air pockets, cold spots, and sluggish operation.

In the truest sense they are "double duty" Traps as they embody the same principle of operation as the "Master" sizes. The method of discharging air is explained on page 204. The "Cub" Traps operate exactly the same as the "Master" sizes.

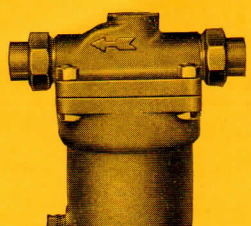
Valves and Seats Interchangeable

The valves and seats are standardized and interchangeable in the different sizes of "Cub" Traps within their range of pressure. Changing a "Cub" Trap for a different pressure, either higher or lower, is extremely simple and is a matter of a couple minutes time because they are so easily accessible. Seats only are changed to provide the correct orifice for a certain pressure range. The seat is unscrewed and another replaced through the plugged opening in the cover, without taking the Trap apart. Nothing else to do. No other changes or adjustments of any kind.

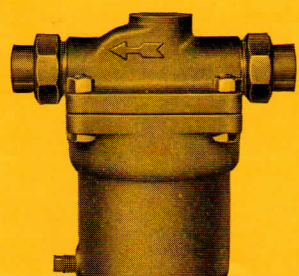
Capacity table on Page 208



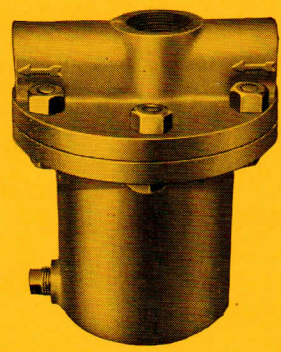
No. 051 Trap
0 to 130 Lbs.
With union connections, pipe size is ½".
With screwed connections, pipe size is ¾".



No. 50 Trap
0 to 250 Lbs.
With union connections, pipe size is ½".
With screwed connections, pipe size is ¾".



No. 51 Trap
0 to 250 Lbs.
With union connections, pipe size is ¾".
With screwed connections, pipe size is 1".



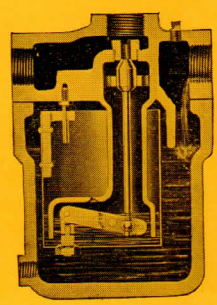
No. 52 Trap
0 to 250 Lbs.
Screwed connections only, pipe size is 1".

Illustration at the right shows screwed connections as available on all sizes of Cub "Airxpel" Steam Traps, when specified.

Also shows the very simple inside working parts of all sizes of the Cub "Airxpel" Steam Trap.

All Cub sizes of "Airxpel" Steam Traps have stainless steel buckets.

All Traps have high chrome stainless steel valves and seats.



There is one inlet and the choice of two outlets on each "Cub" Trap. They may be connected in a straight-way, horizontal run of pipe. Or, the Trap may be connected as an elbow in the line, by using the side inlet and top outlet connections. Of course, the unused outlet must be plugged. Being light in weight, the "Cub" Traps hang in a pipe line without supports, like an ordinary valve.

"AIRXPEL" VERTICAL BUCKET STEAM TRAPS

"CUB" TYPE

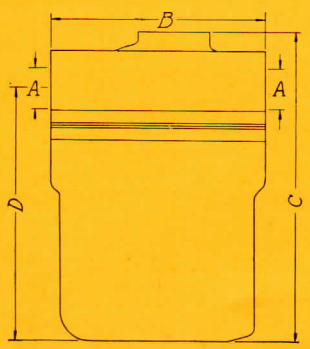
The Internal Water Seal Is Simple

The water seal which prevents waste of steam, is self-contained entirely within the "Airxpel" Trap itself. No part of the water seal is external or held in the piping outside of the Trap. Each Trap is complete ready for operation as delivered. There is no additional piping or fittings needed to provide a water seal.

The water seal is formed by the lower end of the inverted bell tube being submerged in the water, which is purposely retained in the bottom of the bucket after each discharge, to provide this water seal. In regular operation, the valve is closed before the bucket is entirely emptied, thus holding sufficient water in the bucket to cover the bottom of the tube. This forms a perfect water seal, and prevents escape of steam.

Construction

Both body and cover of the "Cub" Traps are cast semi-steel. Valve and seat are high chrome stainless steel. All interior moving parts are stainless steel. The bucket also is stainless steel.



"Cub" Sizes,
Nos. 051, 50, 51, 52.

Simplicity

The inside view of the "Cub" Trap on the preceding page shows how extremely simple this Trap is made. The valve stem, lever and bucket connection with bucket, comprise the operating unit.

All working parts are easily accessible by unbolting the body of Trap from the cover, leaving the inlet and outlet pipe connections undisturbed.

The valve seat is removable through the plugged opening in the cover, after unscrewing the plug.

"Cub" Type

List Prices, Weights, Capacities, Dimensions—In Inches

Size Number of Trap.		051	50	51	52
A—Pipe Size, Inlet and Outlet		*½ or ¾"	*½ or ¾"	*¾ or 1"	1"
List Price**		$7.00	$11.00	$14.00	$23.00
Net Weight in Pounds		5	13	14	24
Code		*Quaint	*Quail	*Quoit	Quirt
Pounds of Water Discharged per Hour at Differential Gauge Pressures of	5	1370	1760	2390	4320
	10	1155	2400	3210	6030
	20	855	1660	2110	4750
	60	480	875	1100	3440
	110	280	620	1120	2450
	130	300	475	660	1900
	150		495	700	2020
	170		515	740	1700
	200		360	545	1445
	250		390	600	1550
B—Width		3¼	4¾	4¾	6¾
C—Height		5½	7⅜	7¾	8¾
D—Center Inlet and Outlet to Bottom		4⅜	6	6⅛	7¾
Inlet to Outlet, Overall		*6½-4¾	*7¾-6	*8—6	6¾
Blow-off Connection		⅛	¼	¼	½

**Add for thermostatic air relief on bucket on all sizes of Cub Traps—List $2.00.

*Pipe sizes and dimensions marked with asterisk furnished unless otherwise specified.

Note that the No. 051, 50 and 51 Traps are each made with two sizes of pipe connections. The smaller connections, which have unions, are furnished, unless the larger connections, which are screwed, are specified.

When ordering be sure to specify:

1—Size number of Traps.
2—Pipe size desired on each.
3—Maximum working steam pressure under which each Trap is to operate.

Double these ratings for continuous discharge capacities.

For complete capacities, please refer to Page 208

CUB TYPE "AIRXPEL" STEAM TRAPS

Trap Capacities and Sizes of Valve Seats

Valve Seat Orifice Dia. Inches		GAUGE PRESSURE POUNDS PER SQ. INCH (DIFFERENTIAL)																								
		1	3	5	10	15	20	30	40	50	60	70	80	90	100	110	120	130	150	160	170	180	200	225	250	Size No. of Trap
		Pounds of Water Discharged Per Hour at Above Pressures																								
	1/16	30	50	70	95	110	125	145	165	185	205	225	240	255	270	280	290	300	320	330	340	350	360	375	390	50
	5/64	45	80	115	155	180	205	245	285	325	355	385	405	425	440	455	465	475	495	505	515	525	545	570	600	51
	3/32	70	120	160	210	255	300	350	400	445	480	520	550	580	600	620	640	660	700	720	740	760	790	830	870	
	1/8	120	210	275	385	460	530	635	735	805	875	935	995	1035	1075	1120	1150	1190	1275	1315	1355	1385	1445	1500	1550	52
	9/64	150	270	345	500	600	675	805	915	1010	1100	1180	1240	1290	1340	1390	1440	1500	1610	1655	1700	1750				
	5/32	200	345	445	605	735	855	1030	1165	1280	1390	1470	1550	1630	1710	1775	1840	1900	2020	2080						
	3/16	280	480	610	860	1030	1190	1440	1630	1750	1875	2000	2120	2240	2360	2450										
Size No. of Trap	7/32	365	630	830	1155	1420	1660	1975	2260	2450	2630	2800	2960													
	1/4	450	845	1085	1455	1830	2110	2540	2860	3170	3440															
051	9/32	620	1065	1370	1870	2290	2630	3170	3640	3970																
50	5/16	790	1370	1760	2400	2980	3440	4100																		
51	3/8	1090	1805	2390	3210	4050	4750																			
	7/16	1500	2560	3290	4650	5700																				
52	1/2	1980	3380	4320	6030																					

Double these ratings for continuous discharge capacities

The capacity ratings on this page are conservatively based on normal intermittent operation of Traps for efficiency and long life. Under flood conditions, these Traps will handle double the rated capacities while the Traps are discharging continuously.

Directions for Using Capacity Table

1. Each size of Trap is represented by a heavy zigzag line. The figures shown on any heavy zigzag line, give the maximum capacity of that Trap, at the highest pressure, and for the largest valve seat orifice which can be used at that particular pressure.

2. Maximum capacity at the highest pressure for each size of valve seat orifice, is the figure in the lower right-hand corner (of any intersection) of the heavy horizontal and vertical zigzag lines.

3. The pressure for any given capacity, is shown at the top of the table, and the size of valve orifice in the extreme left-hand column.

EXAMPLES

1. To Find the Capacity of a Trap.

For an illustration we will take the No. 50 "Airxpel" Trap at 160 lbs. pressure.

Locate 160 lbs. at top of table, proceed down this column to the zigzag line representing the No. 50 Trap. The capacity of this Trap is shown on the heavy zigzag line to be 505 lbs. per hour. The size of the valve seat is 5/64" for this pressure in a No. 50 Trap.

2. To Find What Size of Trap is Needed.

We will assume you have a condition which will require handling 2300 lbs. of water per hour at 110 lbs. pressure.

Follow down the 110 lb. pressure column until you locate a capacity equalling 2300 lbs. or more. The closest available capacity is 2450 lbs., and by tracing left along the heavy zigzag line, we find it will require a No. 52 size of Trap. For this size of Trap and capacity desired at 110 lbs. pressure, the size of the valve seat is 3/16".

Changing Stock Traps for Different Pressures

"Airxpel" Traps must be valved for the highest working pressure under which they are to operate. They will operate successfully at pressures below the maximum for which the Trap is valved, but not above the maximum pressure for which the Trap is valved.

The seat only is changed in any of the Cub "Airxpel" Traps when changing from low to a higher pressure, or from a high to a lower pressure.

The diameter of the orifice is stamped on each seat. The pressure for which the Trap is valved at the factory is stamped on each cover on the rim of plugged opening.

Changing any of the "Cub" Traps for different ranges of working pressures, is done:

(A)—without taking any Trap apart,
(B)—or without making any adjustment,
(C)—and without breaking any pipe connections.

How to change valve seat in "Cub" Traps is described on page 209.

How to Find Size of a Valve Seat

Assuming you have a No. 51 Trap in stock which is now valved for 70 lbs. (9/64" valve seat) and you wish to use this Trap on 110 lbs. pressure.

Follow down the 110 lb. pressure column to the heavy zigzag line for the No. 51 Trap, then horizontally across to the extreme left, where we find the proper valve seat is 1/8" for a No. 51 Trap on 110 lbs. The capacity is 1120 lbs. of water per hour.

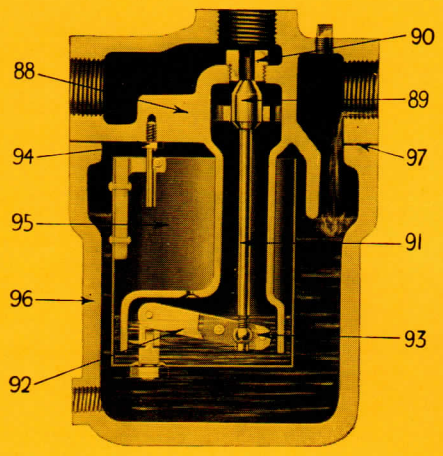
Or, if it is desired to change a Trap from a high to a lower pressure.

Locate the low pressure figure at the top of the table, and follow down to the heavy zigzag line for the size of the Trap being changed, and then left on the horizontal line to the size of the orifice, suitable for the lower pressure.

See next page on how to change valve seats in the "Cub" Traps

PARTS FOR "AIRXPEL" STEAM TRAP

"CUB" SIZES



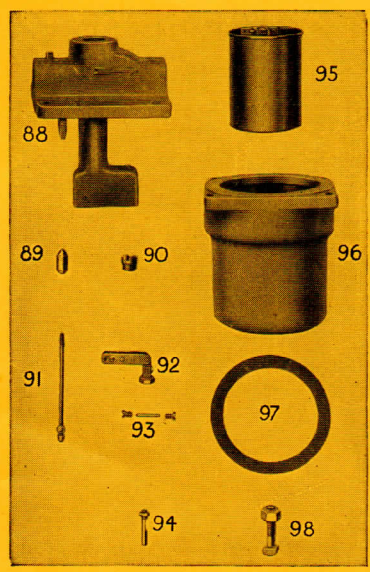
88—Cover and Tube

89—Valve
90—Valve Seat
91—Valve Stem
92—Lever
93—Fulcrum
} Lever Assembly Unit

94—Bucket Stem
95—Bucket
96—Body
97—Gasket
98—Cover Bolts

NOTE—The "Lever Assembly Unit," Parts 89 to 93 inclusive, which make up the working parts, except bucket, can be furnished factory assembled and adjusted ready to place in Trap. When two or three parts must be replaced (the other parts are probably worn also), it is recommended the complete "Lever Assembly Unit" be obtained. This saves the time of putting together and adjusting the new and old parts, and also makes the Trap practically good as new. Whatever is good of the parts removed, may be saved for future spares.

When renewing worn valves and seats, a new valve and seat which have the same size markings, should always be replaced together. A new seat on an old valve, or vice versa, is unlikely to make a perfect fit, and will result in soon wearing the new part.



When ordering Parts be sure to give:

1—Name and number of Part or Parts.
2—Size number of Trap.
3—Maximum working steam pressure on Trap.
4—Mention the Parts are for an "Airxpel" Trap.

How to Change Valve Seats in "Cub" Traps for Different Pressures

The valve seat (part 90) is so readily accessible in the "Cub" Trap because it is just beneath the plugged opening in the cover.

This makes it extremely easy to exchange seats or "revalve" the Trap for any pressure desired.

The seat is slotted for a heavy screw driver. Should the seat stick when attempting to remove it, tap it lightly a few times with a small hammer.

When putting in a new seat, be sure to draw it up tight.

The seat only is changed in any of the Cub "Airxpel" Traps when changing from low to a higher pressure, or from a high to a lower pressure.

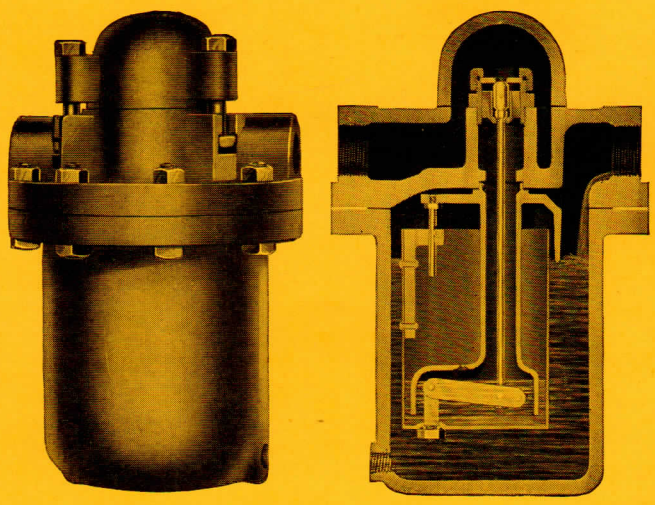
It is not necessary to change the valve, or make any adjustments.

For sizes of valve seats for all pressures, see Page 208

"AIRXPEL" VERTICAL BUCKET STEAM TRAPS

"MASTER" TYPE

Sizes: Nos. 61, 63, 65 Semi-steel Traps for pressures up to 300 lbs.



Master "Airxpel" Steam Traps "60 Series"

The "Master" group comprises the high capacity Traps, and is preferred by many Engineers for general use in power plant service, where dependability for heavy duty is required.

Likewise, they are extensively used in manufacturing plants for drainage of the larger steam heated process equipment, because they do a thorough job of eliminating both air and condensate. This insures maximum heat and efficiency from the equipment drained, and boosts the production output to the top limit. Sectional illustrations, and description of the operation is on the next page.

"Double Life" Valves and Seats

The "Master" Airxpel Traps have "double life" valves and seats, because both the valve and seat are reversible, which provides two new seating surfaces. After long usage, they may be reversed to the new seating surface for a second lifetime of service.

Furthermore, the valve holder has spiral vanes which causes the valve to rotate and reseat itself during each discharge of condensate. This helps to regrind both the valve and seat and keeps the Trap steam tight longer than any other method.

Both valve and seat are easily accessible for reversing by simply lifting off the hood, which uncovers the valve, and without even disturbing the piping, or the cover. Also, a new valve and seat may be installed in the same manner. Please refer to the illustration at the right.

Construction

The body and cover are cast semi-steel for pressures up to 300 lbs. The valves and seats are high Chrome Stainless Steel. All interior working parts are steam bronze, while the bucket is copper in No. 61 and 63, and in No. 65 Trap is stainless steel.

All parts are designed for a liberal factor of safety as to strength, yet they are moderate in weight, so even the largest size may be supported by the pipe line without a special base under the Trap.

Horizontal straight-through pipe connections into the cover of the Trap, are the most economical, as well as the most convenient to install.

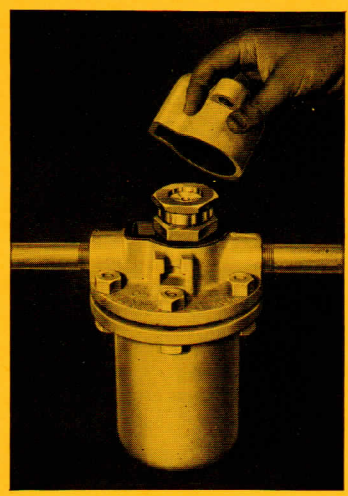
Simplicity

The valve stem, lever and bucket connection with bucket comprise the entire inside working parts. They are simplicity itself, and provide a valve leverage which results in large Trap capacity.

All inside parts are removable by merely unbolting the Trap body, and leaving the inlet and outlet pipe connections intact.

Likewise, merely lifting off the hood on top, gives complete access to both valve and seat.

Accessibility



Shows open access to valve and seat. Easy to reverse valve and seat for "double life." Easy to change Trap valves and seats for different pressures.

The illustration at the right of the "Master" Trap with the hood lifted off, shows the valve and seat uncovered. Notice how open and accessible this makes the valve and seat for reversing or changing. No adjustments are necessary. No special tools are needed — just use an ordinary monkey wrench. The seat lifts out when the valve cap is unscrewed. The valve may be taken out by unscrewing the valve casing and withdrawing a pin. Both operations are very simple, because it is not necessary to disturb either the pipe connections or the cover of the Trap.

Likewise, the body of the Trap can be removed and all working parts, including the bucket, can be taken out while the Trap is still connected in the line. In fact, every part of the Trap is accessible without breaking the pipe connections.

Easy to change trap valves and seats for different pressures, see Page 212

"AIRXPEL" VERTICAL BUCKET STEAM TRAPS

"MASTER" TYPE

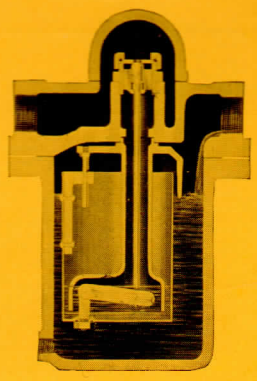


Fig. 1

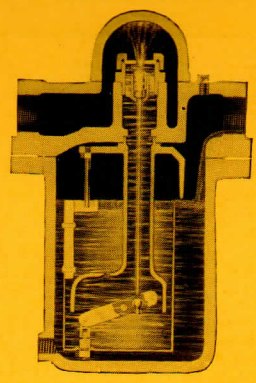


Fig. 2

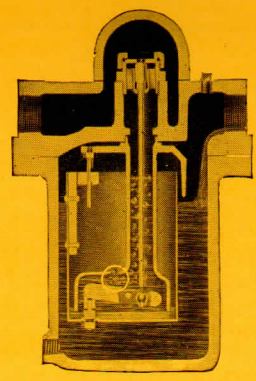


Fig. 3

Operation

Figure 1 shows the Trap with the valve closed shortly after discharge has been completed. More than enough water remains in the bucket after each discharge to form a perfect water seal as described below.

The buoyancy of the bucket is holding the valve shut. Water is now flowing through the inlet, and filling the body around the bucket. Thus the Trap is made ready for the next discharge as shown in Fig. No. 2.

Figure 2 shows the Trap as it begins to discharge after the water has filled the Trap sufficiently to overflow into the bucket, which weighs down the bucket, causing it to sink and open the valve. With the valve open, the water in the bucket is discharged up the tube and out through the valve. The bucket then becomes buoyant and rises again, closing the valve.

Figure 3 shows the Trap immediately after the discharge has been completed and the valve closed.

The bubbles indicate how the air is drawn up into the tube through the air vent, to fill the space evacuated by the water trying to flow back into the bucket.

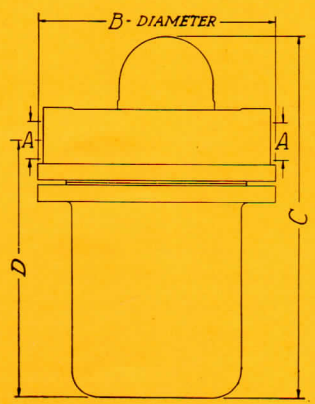
If there is no air in the Trap to replace this water, then the tube will stand full of water.

See Page 204 on "How the "Airxpel" Trap discharges air."

The Internal Water Seal Is Simple

The water seal, which prevents waste of steam, is self-contained entirely within the "Airxpel" Trap itself. No part of the water seal is external or held in the piping outside of the Trap. Each Trap is complete ready for operation as delivered. There is no additional piping or fitting needed to provide a water seal.

The water seal is formed by the lower end of the inverted bell tube being submerged in the water, which is purposely retained in the bottom of the bucket after each discharge, to provide this water seal. In regular operation, the valve is closed before the bucket is entirely emptied, thus holding sufficient water in the bucket to cover the bottom of the tube. This forms a perfect water seal, and prevents escape of steam.



"Master" Sizes,
Nos. 61, 63, 65

"Master" Type
List Prices, Weights, Capacities, Dimensions—In Inches

		61	63	65
Size Number of Trap				
A—Pipe Size, Inlet and Outlet		½ or ¾"*	1 or 1¼"*	1½ or 2"*
List Price		$24.00	$42.00	$55.00
Net Weight in Pounds		28	49	95
Code		Quill*	Quire*	Quern*
Pounds of Water Discharged per Hour at Differential Gauge	Pressures of 5	7020	13250	28430
	10	7600	13530	31300
	20	6710	10550	25580
	60	3440	5670	21450
	110	2450	5600	13670
	140	1960	4875	10875
	150	2020	3870	11200
	170	2130	2990	8560
	200	1820	3170	9250
	250	1550	2510	8000
	300	925	2660	6870
B—Diameter		6¾	8	10
C—Height		12½	15¼	19
D—Center Inlet and Outlet to Bottom		8⅞	11¼	13⅜
Inlet to Outlet, Overall		6⅜	8	9¾
Blow-off Connection		½	½	½

*Pipe sizes and dimensions marked with asterisk furnished unless otherwise specified.

When ordering be sure to specify:
1—Size number of Traps.
2—Pipe size desired on each.
3—Maximum working steam pressure under which each Trap is to operate.

Double these ratings for continuous discharge capacities

For complete capacities, please refer to Page 212

MASTER TYPE "AIRXPEL" STEAM TRAPS

Trap Capacities and Sizes of Valve Seats

Valve Seat Orifice Dia. Inches		GAUGE PRESSURE POUNDS PER SQ. INCH (DIFFERENTIAL)																						
		5	10	15	20	30	40	50	60	70	80	100	110	120	140	150	160	170	200	225	250	275	300	Size No. of Trap
		Pounds of Water Discharged per Hour at Above Pressures																						
	3/32	160	210	255	300	350	400	445	480	520	550	600	620	640	680	700	720	740	790	830	870	900	925	61
	1/8	275	385	460	535	630	735	805	875	935	995	1075	1120	1150	1235	1275	1315	1355	1445	1500	1550	1600	1640	
	9/64	345	500	600	675	805	915	1010	1100	1180	1240	1340	1390	1440	1560	1610	1655	1700	1820	1920	1995	2050	2100	
	5/32	445	605	735	855	1030	1165	1280	1390	1470	1550	1710	1775	1840	1960	2020	2080	2130	2310	2435	2510	2585	2660	63
	3/16	610	860	1030	1190	1440	1630	1750	1875	2000	2120	2360	2450	2540	2720	2810	2900	2990	3170	3330	3455	3580	3700	
	7/32	830	1155	1420	1660	1975	2260	2450	2630	2800	2960	3260	3410	3540	3755	3870	3970	4060	4350	4550	4700	4850	5000	
	1/4	1085	1455	1830	2110	2540	2860	3170	3440	3680	3880	4275	4460	4610	4875	5020	5170	5300	5690	5990	6290	6580	6870	65
	9/32	1370	1870	2290	2630	3170	3640	3970	4300	4600	4900	5400	5600	5800	6150	6340	6510	6680	7190	7600	8000			
	5/16	1760	2400	2980	3440	4100	4670	5170	5670	5990	6310	6910	7180	7450	7915	8140	8360	8560	9250					
	3/8	2390	3210	4050	4750	5460	6140	6870	7500	8100	8630	9460	9840	10200	10875	11200	11500							
	7/16	3290	4650	5700	6710	7720	8830	9800	10700	11540	12200	12960	13670	14200										
	1/2	4320	6030	7480	8620	9890	11100	12300	13300	14240	15100	16750												
Size No. of Trap	9/16	5480	7600	9300	10550	12660	14420	16170	17530	18710	19700													
61	5/8	7020	9510	11430	13280	15700	18040	19850	21450															
	3/4	9580	13530	16220	18570	22395	25500																	
63	7/8	13250	18630	22400	25580																			
	1	16280	23890	28700																				
	1 1/8	22200	31300																					
65	1 1/4	28430																						

Double These Ratings for Continuous Discharge Capacities

The capacity ratings on this page are conservatively based on normal intermittent operation of Traps for efficiency and long life. Under flood conditions, these Traps will handle double the rated capacities while the traps are discharging continuously.

Directions for Using Capacity Table

1. Each size of Trap is represented by a heavy zigzag line. The figures shown on any heavy zigzag line, give the maximum capacity of that Trap, at the highest pressure, and for the largest valve seat orifice which can be used at that particular pressure.

2. Maximum capacity at the highest pressure for each size of valve seat orifice, is the figure in the lower right-hand corner (of any intersection) of the heavy horizontal and vertical zigzag lines.

3. The pressure for any given capacity is shown at the top of the table, and the size of valve orifice in the extreme left-hand column.

EXAMPLES

1. To Find the Capacity of a Trap.

For an illustration we will take the No. 61 "Airxpel" Trap at 170 lbs. pressure.

Locate 170 lbs. at top of table, proceed down this column to the zigzag line representing the No. 61 Trap. The capacity of this Trap is shown on the heavy zigzag line to be 2130 lbs. per hour. The size of the valve seat is 5/32" for this pressure in a No. 61 Trap.

2. To Find What Size of Trap Is Needed.

We will assume you have a condition which will require handling 5200 lbs. of water per hour at 100 lbs. pressure.

Follow down the 100 lb. pressure column until you locate a capacity equalling 5200 lbs. or more. The closest available capacity is 5400 lbs., and by tracing left along the heavy zigzag line, we find it will require a No. 63 size of Trap. For this size of Trap and capacity desired at 100 lbs. pressure, the size of the valve seat is 9/32".

Changing Stock Traps for Different Pressures

"Airxpel" Traps must be valved for the highest working pressure under which they are to operate. They will operate successfully at pressures below the maximum for which the Trap is valved, but not above the maximum pressure for which the Trap is valved.

Changing any of the Master "Airxpel" Traps from a low to a higher pressure, or from a high to a lower pressure, *both the valve and seat must be changed together in sets.*

The diameter of the seat orifice is stamped on both the valve and seat. Always use together a valve and seat having the same size markings.

The pressure for which the Trap is valved at the factory is stamped on each cover on a raised boss.

Changing any of the "Master" Traps for different ranges of working pressures, is done:
(A)—without taking any Trap apart,
(B)—or without making any adjustment,
(C)—and without breaking any pipe connections.
How to change valve and seat in "Master" Traps is described on page 213.

How to Find the Size of a Valve Seat

Assuming you have a No. 65 Trap in stock which is now valved for 60 lbs. (5/8" valve seat) and you wish to use this Trap on 250 lbs. pressure.

Follow down the 250 lb. pressure column to the heavy zigzag line for the No. 65 Trap, then horizontally across to the extreme left, where we find the proper valve seat is 9/32" for a No. 65 Trap on 250 lbs. The capacity is 8000 lbs. of water per hour.

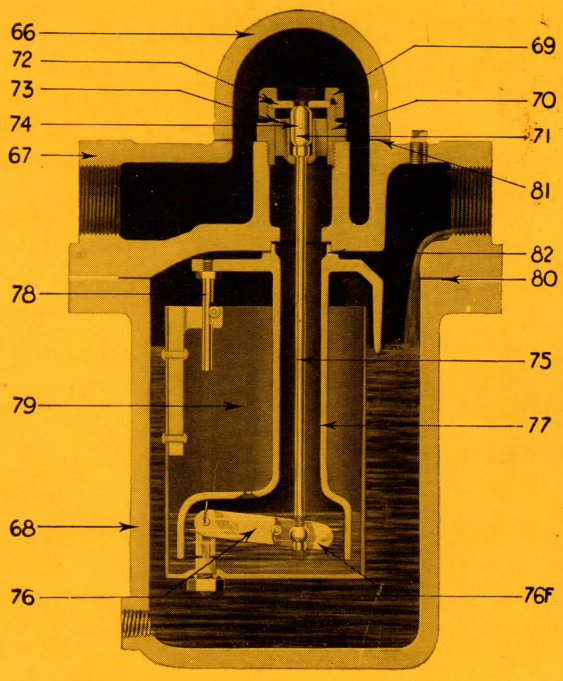
Or, if it is desired to change a Trap from a high to a lower pressure.

Locate the lower pressure figure at the top of the table, and follow down to the heavy zigzag line for the size of the Trap being changed, and then left on the horizontal line to the size of the orifice, suitable for the lower pressure.

See next page on how to change valves and seats in the "Master" Traps

PARTS FOR "AIRXPEL" STEAM TRAP

"MASTER" SIZES

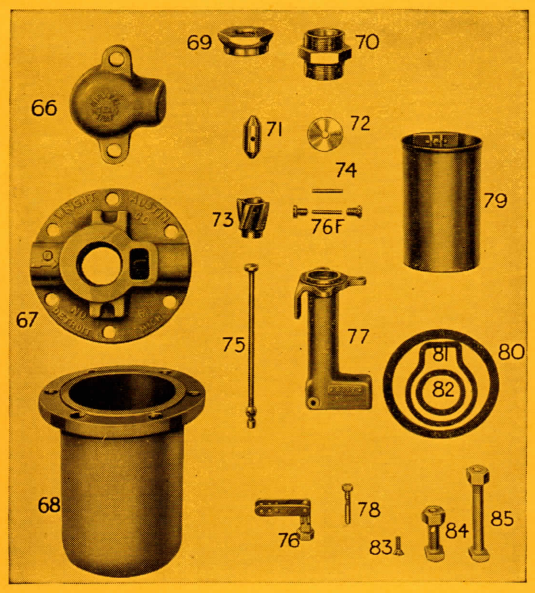


66—Hood
67—Cover
68—Body
69—Valve Cap
70—Valve Casing

71—Valve
72—Valve Seat
73—Valve Holder
74—Valve Pin
75—Valve Stem
76—Lever
76-F—Fulcrum
77—Tube

Lever Assembly Unit

78—Bucket Stem
79—Bucket
80—Cover Gasket
81—Hood Gasket
82—Tube Gasket
83—Tube Screws
84—Cover Bolts
85—Hood Bolts



NOTE—The "Lever Assembly Unit," Parts 71 to 77 inclusive, which make up the working parts, except bucket, can be furnished factory assembled and adjusted ready to place in Trap. When two or three parts must be replaced (the other parts are probably worn also), it is recommended the complete "Lever Assembly Unit" be obtained. This saves the time of putting together and adjusting the new and old parts, and also makes the Trap practically good as new. Whatever is good of the parts removed, may be saved for future spares.

Always replace together, a valve and a seat which have the same size markings. A new valve and seat should also be put in together. A new seat on an old valve, or vice versa, is unlikely to make a perfect fit, and will result in soon wearing the new part. See illustration, page 210, about reversing valve and seat.

When ordering Parts be sure to give:

1—Name and number of Part or Parts.
2—Size number of Trap.
3—Maximum working steam pressure on Trap.
4—Mention that the Parts are for an "Airxpel" Trap.

How to Change Valves and Seats in "Master" Traps for Different Pressures

This is so simple that it can be done with an ordinary monkey wrench. No adjustments of any kind are necessary.

Remove the hood (part 66) as illustrated at the right. You now see the valve cap (part 69) entirely uncovered.

Unscrewing the valve cap frees the valve seat (part 72).

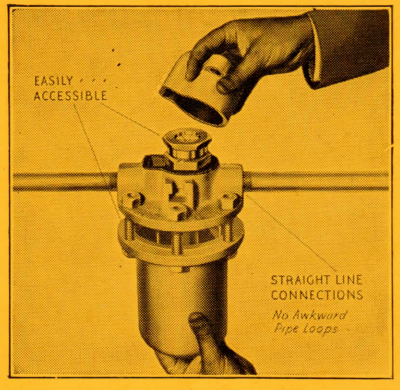
Next, back out the valve casing (part 70). This gives free access to the valve holder (part 73); also the valve pin (part 74).

Then pull out the valve pin (part 74). This releases the valve (part 71) so both valve and seat are now entirely removed.

To put in another valve and seat, you practically reverse these operations. Be sure to replace together, a valve and a seat which have the same size markings. Also make certain to get all joints tight. No other changes or adjustments are required.

This same procedure is followed when reversing the present valves and seats, to the new seating surfaces.

Also, new valves and new seats are replaced in the same simple manner as above described.

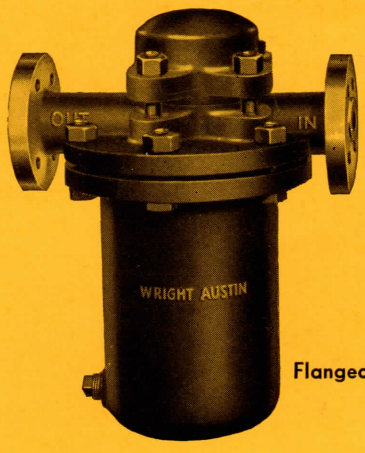


Shows free access to valve and seat—easy to change for different pressures.

For size of valves and seats for all pressures, please refer to Page 212

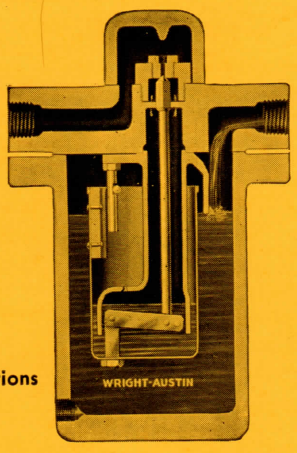
HIGH PRESSURE "AIRXPEL" VERTICAL BUCKET STEAM TRAPS

"STEEL" TYPE



Flanged Connections

Sizes: Nos. 101, 103, 105
Steel Traps for pressures up to 700 lbs.



Screwed Connections

For operating steam pressures up to 700 lbs., the "Airxpel" Steam Traps are made of high quality Cast Alloy Steel. They are of sturdy, compact construction, and every detail is carefully made.

The high pressure "Steel" Traps embody the same simple, proven principle of operation which is one of the patented features of the "Airxpel" design.

A majority of the latest and ultra-modern ships of our New Navy are using Steel "Airxpel" Traps under steam pressures of 450 lbs., and 650 lbs. Many of the new merchant ships carrying high pressure steam are also equipped with "Steel" Traps.

They are equally efficient for 450 and 650 lbs., general service in power plants, and for draining high pressure industrial steam heated process equipment.

Group of Steel "Airxpel" Steam Traps for Marine Service on 450 lbs. and 650 lbs. steam pressure.

With large capacity, especially for their size and weight, and having horizontal, straightline pipe connections, they make a simple and economical piping installation.

Accessibility

Free access to both the valve and seat is provided by simply removing the small hood over the valve, and without breaking any pipe connections, or dismantling the Trap in any way. No special tools are needed. In fact, the valve and seat are easily renewed with an ordinary monkey wrench while the Trap remains in the line. No adjustments of any kind are necessary.

Likewise, the body of the Trap is easily removed and all working parts, including the bucket, may be taken out, without breaking the pipe connections. In fact, every part of the Trap is accessible while it is still connected in the line.

Construction

The body and cover are Cast Alloy Steel. All bolts are high tensile strength alloy steel. The bucket and all inside working parts of these Traps are Stainless Steel, and accurately made. The valve and seat are made from a special wear resisting metal which will not stick under high temperature, and will give a long period of service.

All "Steel" Traps are available with either screwed or flanged inlet and outlet connections in all sizes from ½" to 2". Screwed connections are shipped unless flanged connections are specifically ordered.

Before shipment all Traps are given two tests, a hydrostatic test in excess of double the working pressure, and in addition each Trap is put under an actual steam operating test.

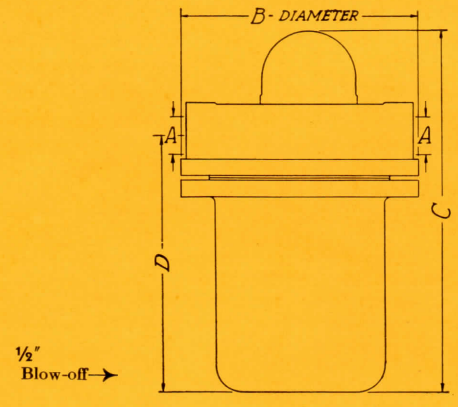
HIGH PRESSURE "AIRXPEL" VERTICAL BUCKET STEAM TRAPS

"STEEL" TYPE

The Internal Water Seal Is Simple

The water seal, which prevents waste of steam, is self-contained entirely within the "Airxpel" Trap itself. No part of the water seal is external or held in the piping outside of the Trap. Each Trap is complete ready for operation as delivered. There is no additional piping or fittings needed to provide a water seal.

The water seal is formed by the lower end of the inverted bell tube being submerged in the water, which is purposely retained in the bottom of the bucket after each discharge, to provide this water seal. In regular operation, the valve is closed before the bucket is entirely emptied, thus holding sufficient water in the bucket to cover the bottom of the tube. This forms a perfect water seal, and prevents escape of steam. Please refer to sectional illustration on page 214, which shows water over the end of the tube.



Simplicity of Trap

The sectional view of the inside of the Steel "Airxpel" Trap on page 214 clearly shows how very simple this Trap is made. The valve stem, lever and bucket connection with bucket, comprise the complete operating unit.

All inside parts are removable by merely unbolting the Trap body, and leaving the inlet and outlet pipe connections intact.

Likewise, merely lifting off the hood on top, gives complete access to both valve and seat.

"Steel" Type

List Prices, Weights, Capacities, Dimensions—In Inches

Size Number of Trap		101	103	105
Code Word		Hydrogen*	Nitrogen*	Oxygen*
A-Pipe Size, Inlet and Outlet		½ or ¾*	1 or 1¼*	1½ or 2*
List Prices:				
Screwed Connections		$75.00	$100.00	$150.00
Flanged Conn. F & D		90.00	125.00	180.00
Weight in Pounds—				
Screwed Connections		35	68	106
Flanged Conn. F & D		45	86	125
Pounds of Water Discharged per Hour at Differential Gauge Pressure of	200	1610	2445	5385
	300	1350	2995	6595
	400	1155	2590	5630
	450	1125	2415	5550
	500	850	1745	4275
	600	930	1910	4680
	700	995	1515	3820
B-Overall — Inlet to Outlet Screwed Connections		7	9⅜	10¾
B-Face to Face—Inlet to Outlet Flanged Connections		10¼*‡	13⅜*‡	15⅝*‡
B-Diameter		7	9⅜	10¾
C-Height		12¾	15½	17¾
D-Center Inlet and Outlet to Bottom		9¼	11¾	13⅝
Blow-off Connection		½	½	½

*Indicates pipe sizes furnished, unless otherwise ordered.
‡Face to face ½"—10⅛", 1"—13⅛", 1½"—15⅛".

When ordering be sure to specify:

1—Size number of Traps.
2—Pipe size desired on each.
3—Maximum working steam pressure under which each Trap is to operate.

Double these ratings for continuous discharge capacities

For complete capacities, please refer to Page 216

STEEL TYPE "AIRXPEL" STEAM TRAPS

Trap Capacities and Sizes of Valve Seats

Double these ratings for continous discharge capacities

Size No. of Trap	Size No. of Valve and Seat	GAUGE PRESSURE POUNDS PER SQ. INCH (DIFFERENTIAL)									Size No. of Trap
		100	200	300	400	450	500	600	650	700	
		Pounds of Water Discharged per Hour at Above Pressures									
	46	380	535	660	760	805	850	930	965	995	101
	41	530	750	920	1060	1125	1185	1295	1350	1390	
	38	580	815	1000	1155	1225	1290	1415	1470	1515	103
	32	779	1100	1350	1560	1655	1745	1910	1985	2045	
101	28	1140	1610	1975	2280	2415	2550	2790	2900	2990	
	25	1295	1830	2240	2590	2745	2895	3170	3295	3395	
	21	1455	2060	2520	2910	3090	3255	3565	3710	3820	105
103	17	1730	2445	2995	3455	3665	3865	4230			
	14	1915	2705	3310	3825	4055	4275	4680			
	3	2620	3700	4535	5235	5550					
	2	2815	3980	4875	5630						
	F	3810	5385	6595							
105	N	5255									

The capacity ratings on this page are conservatively based on normal intermittent operation of Traps for efficiency and long life. Under flood conditions, these Traps will handle double the rated capacities while the Traps are discharging continuously.

Directions for Using Capacity Table

Each size of Trap is represented by a heavy zigzag line. The figures shown on any heavy zigzag line, give the maximum capacity of that Trap at the highest pressure, and for the largest valve seat orifice which can be used at that particular pressure.

Maximum capacity at the highest pressure for each size of valve seat orifice, is the figure in the lower right-hand corner (of any intersection) of the heavy horizontal and vertical zigzag lines.

The pressure corresponding to any given capacity is shown at the top of the table, and the size of valve orifice in the extreme left-hand column.

EXAMPLES

1. To Find the Capacity of a Trap.

For an illustration, we will take the No. 101 "Airxpel" Trap at 300 lbs. pressure.

Locate 300 lbs. at top of table, proceed down this column to the zigzag line representing the No. 101 Trap. The capacity of this Trap is shown on the heavy zigzag line to be 1350 lbs. per hour. The size of the valve seat is No. 32 for this pressure in a No. 101 Trap.

2. To Find What Size of Trap Is Needed.

We will assume you have a condition which will require handling 2500 lbs. of water per hour at 400 lbs. pressure.

Follow down the 400 lb. pressure column until you locate a capacity equalling 2500 lbs. or more. The closest available capacity is 2590 lbs., and by tracing left along the heavy zigzag line, we find it will require a No. 103 size of Trap. For this size of Trap and capacity desired at 400 lbs. pressure, the size of the valve seat is No. 25.

ChangingStockTraps forDifferentPressures

"Airxpel" Traps must be valved for the highest working pressure under which they are to operate. They will operate successfully at pressures below the maximum for which the Trap is valved, but not above the maximum pressure for which the Trap is valved.

Changing any of the Steel "Airxpel" Traps from a low to a higher pressure, or from a high to a lower pressure, *both the valve and seat must be changed together in sets.*

The diameter of the seat orifice is stamped on both the valve and seat. Always use together a valve and seat having the same size markings.

The pressure for which the Trap is valved at the factory is stamped on each cover on a raised boss.

Changing any of the "Steel" Traps for different ranges of working pressures, is done:

(A)—without taking any Trap apart,

(B)—or without making any adjustment,

(C)—and without breaking any pipe connections.

How to change valve seat in "Steel" Traps is described on page 217.

How to Find the Size of a Valve Seat

Assuming you have a No. 103 Trap in stock which is now valved for 300 lbs. (No. 17 Valve Seat), and you wish to use this Trap on 450 lbs. pressure.

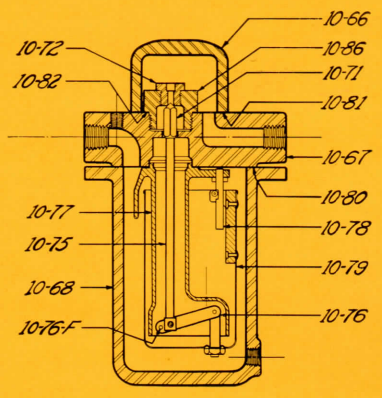
Follow down the 450 lb. pressure column to the heavy zigzag line for the No. 103 Trap, then horizontally across to the extreme left, where we find the proper valve seat is No. 28 for a No. 103 Trap on 450 lbs. pressure. The capacity is 2415 lbs. of water per hour.

Or, if it is desired to change a trap from a high to a lower pressure.

Locate the lower pressure figure at the top of the table, and follow down to the heavy zigzag line for the size of the trap being changed, and then left on the horizontal line to the size of the orifice, suitable for the lower pressure.

See Page 217 on how to change valves and seats in "Steel" Traps

PARTS FOR HIGH PRESSURE "STEEL" TRAP



10-66—Hood
10-67—Cover
10-68—Body

10-71—Valve
10-72—Valve Seat
10-75—Valve Stem
10-76—Lever
10-76-F—Fulcrum Pin
10-77—Tube

Lever Assembly Unit

10-78—Bucket Stem
10-79—Bucket
10-80—Cover Gasket
10-81—Hood Gasket
10-82—Valve Seat Holder Gasket
10-86—Valve Seat Holder

NOTE—The "Lever Assembly Unit," Parts 10-71 to 10-77 inclusive, which make up the working parts, except bucket, can be furnished factory assembled and adjusted ready to place in Trap. When two or three parts must be replaced (the other parts are probably worn also), it is recommended the complete "Lever Assembly Unit" be obtained. This saves the time of putting together and adjusting the new and old parts, and also makes the Trap practically good as new. Whatever is good of the parts removed, may be saved for future spares.

The valve and seat should always be replaced together. A new seat on an old valve, or vice versa, is unlikely to make a perfect fit, and will result in soon wearing the new part. Make certain the new valve and seat are marked the same size.

When ordering Parts be sure to give:

1—Name and number of Part or Parts.
2—Size number of Trap.
3—Maximum working steam pressure on Trap.
4—Mention that the Parts are for "Airxpel" Trap.

How To Change Valves and Seats In "Airxpel" Steel Traps

Easy removal of both the valve and seat in the "Steel" Trap has been provided. A monkey wrench or open end wrench may be used. No special tools are needed. No adjustments of any kind are necessary.

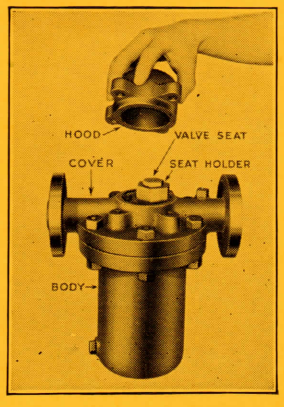
Simply lifting off the hood (part 10-66), as shown at the right, makes both valve and seat accessible.

Next unscrew the valve seat (part 10-72).

Then back out the valve seat holder (part 10-86).

Now there is ample room to unscrew the valve (part 10-71).

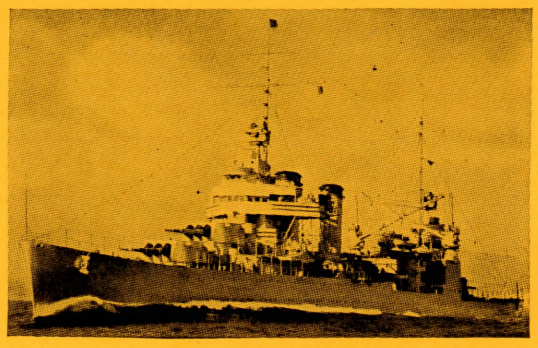
To put in another valve and seat, you practically reverse these operations. Be sure to replace together a valve and a seat which have the same size markings. Also make certain to get all joints tight. No other changes or adjustments are required.



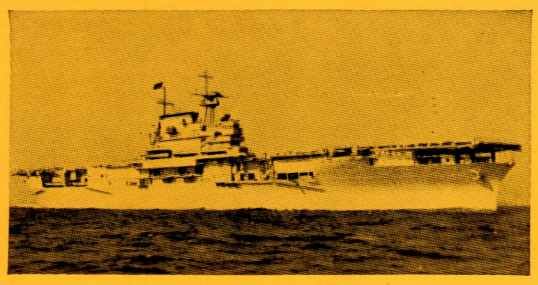
Shows open access to valve and seat. Easy to renew.

For sizes of valves for all pressures, see Page 216

WHERE ONLY THE BEST IS GOOD ENOUGH

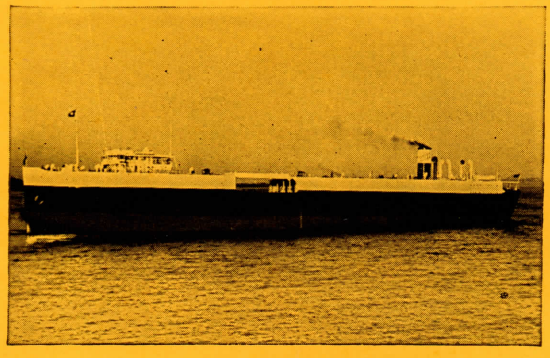


U. S. Navy Modern Cruiser

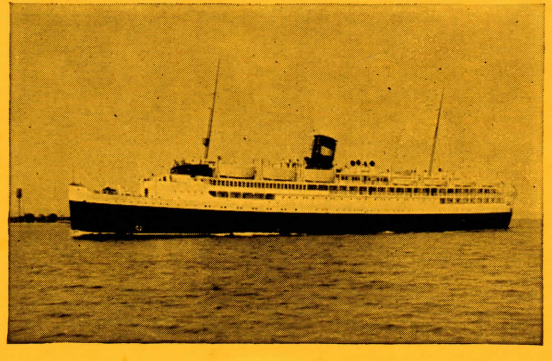


U. S. Navy Aircraft Carrier

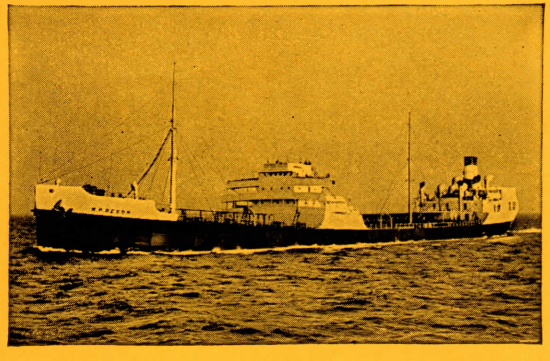
Nearly 90% of the latest U. S. Navy Ships are equipped with Steel "Airxpel" Steam Traps on steam pressures up to 450 and 650 lbs. These include Cruisers, Destroyers and Gunboats; also the newest Aircraft Carriers.



S.S. "Seatrain New York", and her sister ship, S.S. "Seatrain Havana", both use Steel "Airxpel" Steam Traps on 400 lbs. steam pressure. These ships swallow up an entire freight train in New York and run it off on Cuba railroads. Built by Sun Shipbuilding & Dry Dock Co.

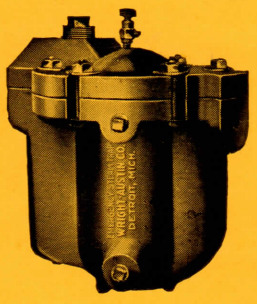


S.S. "Acadia", one of the new coast liners operating on 400 lbs. steam pressure and using Steel "Airxpel" Steam Traps. Built by Newport News Shipbuilding & Dry Dock Co.

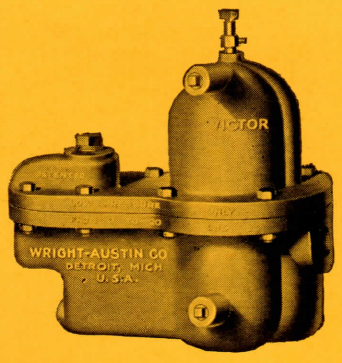


S.S. "Resor" is a modern tanker. Carries 400 lbs. steam pressure and is equipped with Steel "Airxpel" Steam Traps. Built by Federal Shipbuilding & Dry Dock Co.

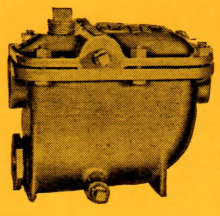
WRIGHT-AUSTIN FLOAT TYPE STEAM TRAPS



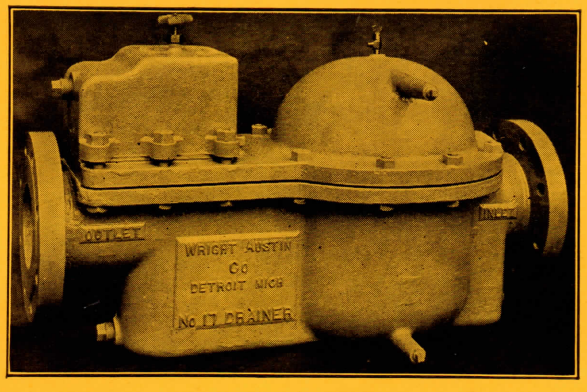
"Emergency" 3-Valve Trap
Page 228.



"Victor" Low Pressure Trap
Page 224.



"Combination" Trap
Pages 220 and 222.

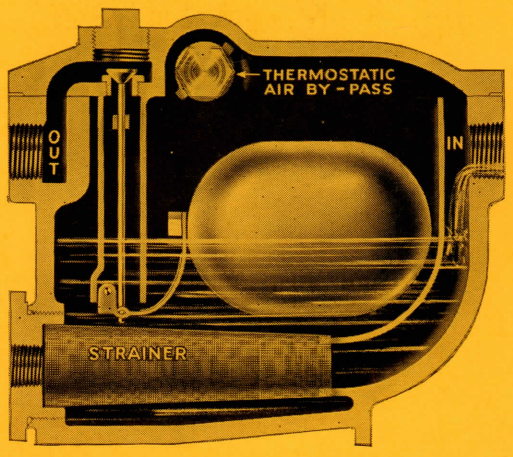


The "Drainer"
Page 232.

The following pages cover our four float types, the "Emergency," "Victor," "Combination," and Heavy Duty Flood "Drainers." The "Bucket" traps are shown on the preceding pages.

No. 23 "COMBINATION" FLOAT AND THERMOSTATIC STEAM TRAPS

FOR VACUUM AND PRESSURES UP TO 40 LBS.



No. 23-C "Combination" Trap with Thermostatic Air By-pass and Strainer.

For all pressures up to 40 lbs., the Wright-Austin "Combination" Float and Thermostatic Steam Trap is broadly guaranteed to be more satisfactory than any type or pattern of bucket steam trap.

It is especially adapted for the entire field of steam heating, and for all kinds of heating equipment and services, within its capacity, and for steam pressures from vacuum up to 40 lbs. gauge.

Because of its unfailing reliability over long periods, it has been highly successful on district heating systems ahead of condensation meters, vacuum heating systems, drips, blast coils and other heating coils, cookers, driers, and steam heated process equipment of all kinds.

Large Capacity

Capacity to handle large volumes of condensation through this Trap is obtained by having an extra large valve orifice. This large orifice is made possible because the valve opens outward—above the seat in the same direction as the outflowing condensation.

By opening away from the seat in the outward direction the valve moves with the pressure, and not against it. as in other Traps.

No pressure is needed to operate this Trap, although what pressure there may be exerts its force to assist in discharging the condensate more rapidly.

Deep Water Seal

This Trap maintains a deep water seal by completely submerging the outlet tube in water and preventing the escape of any steam.

Extremely Simple

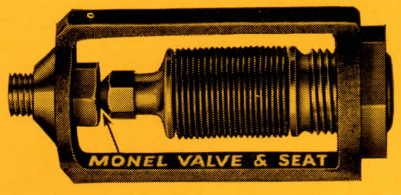
This Trap is so simple that the complete operating unit consists only of the float and lever, and valve and stem.

No. 23-C "Combination" Steam Trap includes both Thermostatic Air By-pass, also Strainer as illustrated.

The letter "C" after the number is used to indicate "complete" meaning the Trap is furnished with both Thermostatic Air By-pass and Strainer, when the letter "C" is given.

To specify, write—No. 23-C "Combination" Float and Thermostatic Steam Trap, and state size of pipe connections desired.

Thermostatic Air By-pass



The Thermostatic Air By-pass is located high up against the cover of the Trap where it is not affected by the condensate. As long as there is any air in the Trap, the thermostatic element will hold open the air vent, thus keeping the air removed continuously, as well as quickly relieving the air when starting up a cold system.

The air is discharged into the outlet of the Trap through a passage cast in the cover, which by-passes around the condensate valve.

When steam reaches the Trap, the thermostat will close the air vent, steam tight.

The Thermostatic Air By-pass is a complete unit in itself and is both positive and reliable. It is attached to the inside of the Trap cover, and may be detached or replaced intact as a unit. A strong and durable bellows type of thermostat is used.

The Thermostatic Air By-pass is not recommended on working steam pressure over 40 pounds per square inch.

If desired the Thermostatic Air By-pass may be omitted. If omitted, then a hand operated pet cock air vent is furnished on the outside of the Trap cover, without charge.

If for any reason the Trap becomes flooded or filled by a sudden accumulation of condensate, the Thermostatic Air By-pass will act as an emergency condensate discharge valve, and assist in quickly relieving the Trap.

No. 23 "COMBINATION" FLOAT and THERMOSTATIC STEAM TRAPS

No. 23-T "Combination" Steam Trap includes the Thermostatic Air By-pass only as illustrated.

The letter "T" after the number is used to indicate "Thermostatic Air By-pass," meaning the Trap is furnished with Thermostatic Air By-pass only, when the letter "T" is given.

To specify, write—No. 23-T "Combination" Float and Thermostatic Steam Trap, and state size of pipe connections desired.

Construction

It is a modern, well designed steam Trap, which combines the float type with inside integral Thermostatic Air By-pass, and a built-in Strainer, when desired.

Straightline, horizontal inlet and outlet pipe connections make the "Combination" Trap easy and economical to connect up.

All working parts are easily accessible by being attached to and removable with the cover of the trap without disturbing the pipe connections.

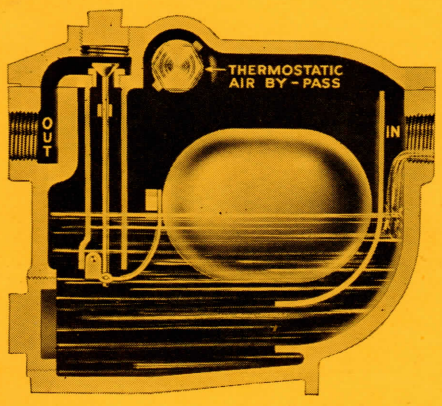
The leverage is designed to firmly hold the float movement in a vertical plane only, so the float cannot touch the side wall, top or bottom of the trap.

Strainer

All drainage flowing into the Trap must pass through the built-in Strainer, if used.

The Strainer is perforated sheet brass, having 400 $\frac{1}{32}$" holes per square inch. The open area through the Strainer is several times the area of the largest pipe connection on the Trap. The Strainer is made in the shape of a cylinder, and is firmly held at both ends. One end fitting around the tube-shaped inlet to the Strainer, while the other end is securely held by the retaining bushing. This retaining bushing is tapped for ½" blow-off connection for flushing out the Strainer as well as draining the Trap. The Strainer is optional and may be omitted if desired.

Every Trap is carefully tested under actual steam conditions before shipment and is fully guaranteed.



No. 23-T "Combination" Trap
with Thermostatic Air By-pass.
(Strainer ommited)

List Prices, Weight, Capacities, Dimensions—In Inches

	Trap No.	*List Price*	*Code*
Including both Thermostatic Air By-pass and Strainer	No. 23-C	$21.00	Kabel
Including Thermostatic Air By-pass, but no Strainer	No. 23-T	$20.00	Kamer
Pipe Size Inlet and Outlet, and Telegraphic Code for pipe size	¾"		Kenda
	1"		Known
	1¼"		Kolan
Weight in Pounds			25
Capacity in Pounds of water per hour discharged at differential gauge — Pressures of	1		1125
	3		1945
	5		2500
	10		3540
	20		5015
	30		6195
	40		7150
Inlet to Outlet Overall			9¼"
Width			5⅝"
Height			7½"
C/L Pipe Connections to Bottom			5"

Water gauge suitable for all sizes, List $2.70. Code word, "Fauge." Water gauges not furnished unless specified.

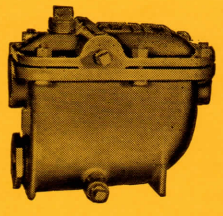
Maximum working steam pressure with thermostatic air by-pass is 40 pounds.

When ordering—

1—Be sure to specify the "letter" after Trap number to designate the internal parts desired.

2—Give size of pipe connection desired, otherwise 1¼" connection will be furnished.

3—State maximum working steam pressure.

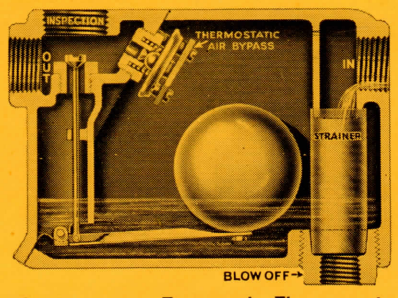


No. 23 "Combination" Trap

For draining compressed air equipment, see Page 234

No. 21 "COMBINATION" FLOAT AND THERMOSTATIC STEAM TRAPS

FOR VACUUM AND PRESSURES UP TO 40 LBS.



No. 21-C "Combination" Trap with Thermostatic Air By-pass and Strainer.

No. 21-C "Combination" Float and Thermostatic Steam Trap includes both the Thermostatic Air By-pass, also Strainer as illustrated above.

The letter "C" after the number is used to indicate "complete" meaning the Trap is furnished with both Thermostatic Air By-pass and Strainer, when the letter "C" is given.

This No. 21 Trap is simply a smaller size of the No. 23 "Combination" Trap described on page 220.

Otherwise, the general description of the functions and operation of the No. 23 Trap also apply to the No. 21 Trap shown above.

As a result of being a smaller pattern, the outside shape has been modified, and a different Thermostatic Air By-pass is used.

For use on heating systems, cooking and drying equipment, etc., it is both efficient and reliable.

It is suitable for vacuum return lines and pressures up to 40 lbs. gauge.

In this Trap the valve is located above or outside the seat, and in opening simply lifts vertically off the seat, without resistance from pressure within the Trap or from the outflowing condensate as in other Traps in which the valve opens inward against the pressure.

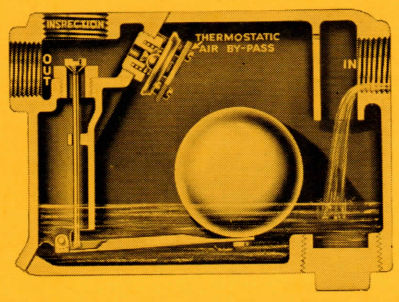
This construction permits the use of a much larger orifice resulting in large capacity for the size and cost of the Trap.

Thermostatic Air By-pass

Two types of Thermostatic Air By-Passes are provided for this Trap. One is the single bellows type, and is suitable for pressures from 0 to 15 lbs. The other is our multifold type, which is suitable for pressures from 0 to 40 lbs. at small extra cost. Both types are of proven dependability and accuracy.

The air is discharged into the outlet of the Trap through a passage cast in the cover, which by-passes around the condensate valve.

This Air By-pass acts as an emergency condensate discharge valve, if for any reason the main discharge valve is temporarily overloaded, and the Trap filled by a heavy accumulation of condensate.



No. 21-T "Combination" Trap with Thermostatic Air By-pass. (Strainer ommited)

No. 21-T "Combination" Float and Thermostatic Steam Trap includes the Thermostatic Air By-pass only as illustrated above. The Strainer is optional.

The letter "T" after the number is used to indicate "Thermostat", meaning the Trap is furnished with the Thermostatic Air By-pass only, when the letter "T" is given.

List Prices, Weight, Capacities, Dimensions—In Inches

		Trap No.	*List Price*	*Code*
Including both Thermostatic Air By-pass and Strainer 0 to 15 lbs.		No. 21-C	$15.00	Keber
Including both Thermostatic Air By-pass and Strainer 0 to 40 lbs.		No. 21-C4	$16.00	Ketch
Including Thermostatic Air By-pass, but no Strainer 0 to 40 lbs.		No. 21-T	$14.50	Kelso
Pipe Size Inlet and Outlet, and Telegraphic Code for pipe size			½″	Karat
			¾″	Kiosk
Weight in Pounds				12
Capacity in Pounds of Water per Hour at Differential Gauge	Pressures of	With Low Pressure Thermostatic Air By-Pass 0 to 15 lbs.	1	360
			3	550
			10	860
			15	1245
		With High Pressure Thermostatic Air By-Pass 0 to 40 lbs.	20	1750
			25	1965
			30	1175
			40	1360
Inlet to Outlet Overall				7⅞″
Width				4⅝″
Height				6½″
C/L Pipe Connections to Bottom				4″

NOTE—No water gauge openings provided on this Trap. Maximum working steam pressure with thermostatic air by-pass is 40 pounds.

When ordering—

1—Be sure to specify the "letter" after Trap number to designate the internal parts desired.

2—Give size of pipe connections preferred, otherwise ¾″ connections will be furnished.

3—State maximum working steam pressure.

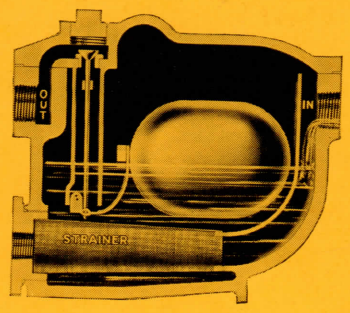
Strainer

All drainage flowing into the Trap must pass through the built-in Strainer, if used.

The Strainer is perforated sheet brass, having 400 $\frac{1}{32}$″ holes per square inch. The open area through the Strainer is several times the area of the largest pipe connection on the Trap. The Strainer is made in the shape of a cylinder, and is firmly held at both ends; one end fitting over the tube-shaped inlet to the Strainer, while the other end is securely held by the retaining bushing. This retaining bushing is tapped for ½″ blow-off connection for flushing out the Strainer as well as draining the Trap. The Strainer may be omitted if not desired.

SMALL FLOAT TRAPS

PRESSURES 0 TO 125 LBS.



No. 23 TRAP

Pressure
0 to 125 Lbs.

Strainer is optional

This is the simple form of the No. 23 "Combination" Trap without Thermostatic Air By-pass, which is shown on page 220.

It provides a low cost, simple, compact Trap of liberal capacity and carries the Wright-Austin high standard of quality.

Straightline, horizontal inlet and outlet pipe connections make the No. 23 Trap easy and economical to install.

In operation the No. 23 Trap carries a deep water seal completely submerging the outlet in from 1½″ to 2″ of water and preventing escape of any steam.

The leverage is designed to firmly hold the float movement in a vertical plane only, so the float cannot touch the side wall, top or bottom of the trap.

All working parts are easily accessible by being attached to and removable with the cover of the Trap without disturbing the pipe connections.

List Prices, Weight, Capacities, Dimensions—In Inches

	Trap No.	*List Price*	*Code*
Including Strainer, and Pet Cock Air Vent	No. 23-S	$17.00	Kacey
Without Strainer, but including Pet Cock Air Vent	No. 23-P	$16.00	Kasky
Pipe Size Inlet and Outlet, and Telegraphic Code for Pipe Size ¾″			Kenda
Pipe Size Inlet and Outlet, and Telegraphic Code for Pipe Size 1″			Known
Pipe Size Inlet and Outlet, and Telegraphic Code for Pipe Size 1¼″			Kolan
Weight in Pounds			25

Capacity in Pounds of water per hour discharged at differential gauge pressures of

Lbs. Press.	1	3	5	10	25	40	50	75	100	125
Capacity..	1125	1945	2500	3540	5655	7150	3000	3675	4250	3560

Inlet to Outlet Overall	9¼″
Width	5⅝″
Height	7½″
C/L Pipe Connections to Bottom	5″

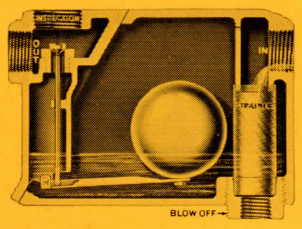
Water gauge suitable for all sizes, List $2.70. Code word, "Fauge." Water gauges not furnished unless specified.

When ordering—

1—Be sure to specify letter "S" after Trap number if Strainer is desired.

2—Give size of pipe connections preferred—otherwise, 1¼″ connections will be furnished.

3—State maximum working steam pressure.



No. 21 TRAP

Pressure
0 to 40 Lbs.

Strainer is optional

Illustrated above is the No. 21 Trap without Thermostatic Air By-pass, which is described on page 222.

This Trap supplies that field of service below 40 lbs. pressure, where moderate capacity and low cost are essential.

It is well made in every way and has but few parts. The float is rigidly attached to the lever so it moves in a vertical plane only and cannot touch body or cover of Trap. Horizontal pipe line connection makes installation easy and economical.

List Prices, Weight, Capacities, Dimensions—In Inches

	Trap No.	*List Price*	*Code*
Including Strainer and Pet Cock Air Vent	No. 21-S	$12.50	Kraft
Without Strainer, but including Pet Cock Air Vent	No. 21-P	$12.00	Koven
Pipe Size Inlet and Outlet, and Telegraphic Code for pipe size ½″			Karat
Pipe Size Inlet and Outlet, and Telegraphic Code for pipe size ¾″			Kiosk
Weight in Pounds			12

Capacity in Pounds of water per hour discharged at differential gauge pressures of

Lbs. Press.	1	3	5	10	15	20	25	30	40
Capacity..	360	550	860	1245	1515	1750	1965	1175	1360

Inlet to Outlet Overall	7⅞″
Width	4⅝″
Height	6½″
C/L Pipe Connections to Bottom	4″

NOTE—No Water Gauge openings in this Trap.

When ordering—

1—Be sure to specify letter "S" after Trap number if Strainer is desired.

2—Give size of pipe connections preferred, otherwise ¾″ connections will be furnished.

3—State maximum working steam pressure.

Strainer in No. 23 and No. 21 Traps

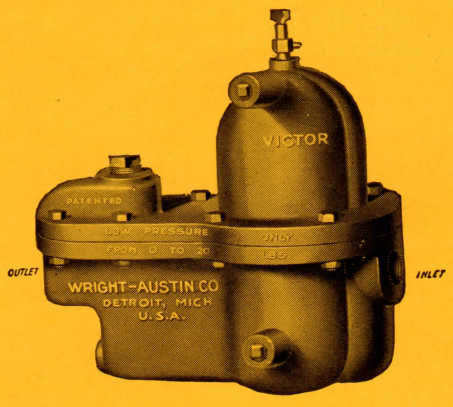
The Strainer is optional in either the No. 23, or No. 21 Traps, and is furnished only when ordered with the Trap at the list price given for each Trap with Strainer.

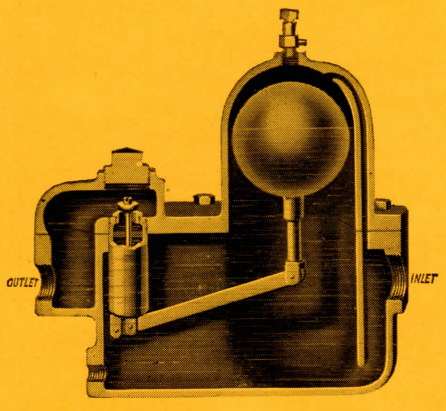
All drainage flowing into the Trap must pass through the built-in Strainer, when used.

The Strainer is perforated sheet brass, having 400 $\frac{1}{32}$″ holes per square inch. The open area through the Strainer is several times the area of the largest pipe connection on the Trap. The Strainer is made in the shape of a cylinder, and is firmly held at both ends; one end fitting around the tube-shaped inlet to the Strainer, while the other end is securely held by the retaining bushing. This retaining bushing is tapped for ½″ blow-off connection for flushing out the Strainer as well as draining the Trap.

"VICTOR" LOW PRESSURE STEAM TRAP

(FOR PRESSURES FROM 0 TO 20 LBS.)





The "Victor" Trap is a heavy duty Trap and is especially designed for low pressure service, and is not an adaptation of a high pressure Trap for low pressure work. No pressure is required to operate the "Victor" Trap. A difference of water level so slight as hardly to be measurable will operate it. It will give perfect results under any working pressure from 0 to 20 pounds.

Dependability

Its most valuable feature is dependability, which follows as a natural result of extremely simple and rugged construction.

Large Capacity

It is especially made for draining large volumes of condensation from low pressure apparatus, such as heating systems, drying processes, hot water heaters, coils, evaporators, etc.

This large capacity makes it often possible to install a size of "Victor" Trap (measuring size by inlet and outlet pipe diameter) which is considerably smaller, for the same service, than Traps of other makes. This results in a very distinct economy in first cost.

We recommend most strongly that Traps be selected on the basis of capacity in pounds of water per hour, not on the basis of pipe size; see capacities of "Victor" Traps.

For Draining Oil Separators

As an Oil or Grease Trap it gives very excellent results. Because of the extremely large valve, it will easily handle any thick, gummy oil that could flow through the pipe from the separator, without choking up the Trap. A strainer is not recommended on any Oil Trap. For detailed recommendations please refer to page 233.

Operation

In the "Victor" Trap the valve opens outward above the seat, and away from pressure within the Trap. Whatever pressure there may be within the Trap exerts its force underneath the valve, assisting the float to open it.

By opening the valve with the pressure (not against it, as in other Traps) and in the same direction as the outgoing flow of condensation, the "Victor" Trap becomes especially adapted for low pressure service.

This construction permits the use of a very large valve, providing enormous capacity at extremely low pressure. In operation the condensation simply overflows through the uplifted valve, freely and unobstructed.

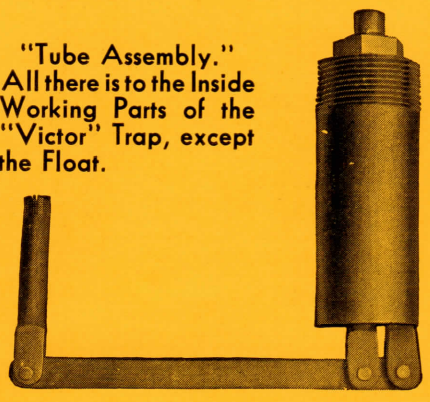
It also serves to make the "Victor" Trap its own safety valve, as the excess pressure, whether water or steam, will force open the valve until the Trap is relieved. This is a feature of considerable importance in some installations, especially where pressure reducing valves are liable to stick open and allow pressure to build up.

"VICTOR" LOW PRESSURE STEAM TRAP

(FOR PRESSURES FROM 0 TO 20 LBS.)

Deep Water Seal

Carrying a deep water seal of several inches, completely submerges the outlet tube and absolutely prevents escape or waste of any steam.



"Tube Assembly." All there is to the Inside Working Parts of the "Victor" Trap, except the Float.

Construction

The illustration on this page marked "Tube Assembly" shows the extremely simple and rugged inside working parts (float not shown) of the "Victor" Trap.

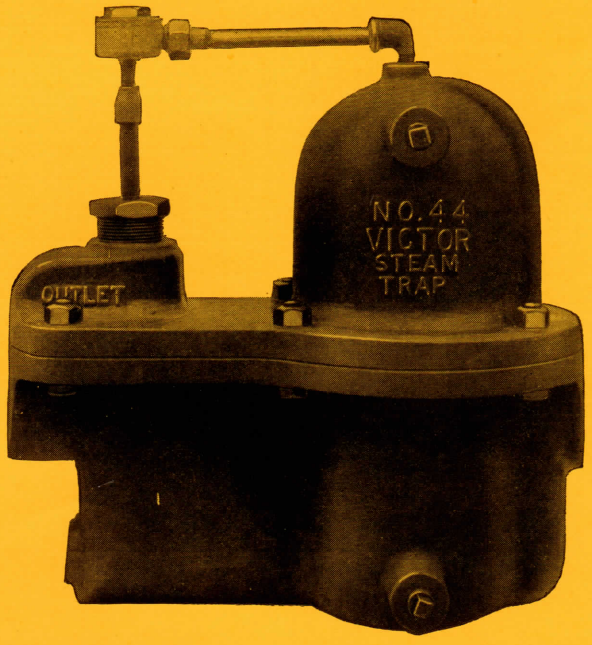
The three working parts are attached to the cover of the Trap, which may readily be removed to the workbench, if necessary, by just lifting off the cover, without breaking any piping to the Trap.

The valve and seat are located directly under the test plug in the cover, where they can be readily inspected and tested with the cover in place. They are easily renewed by the use of ordinary tools.

Materials

Only the highest grade of materials and workmanship are used in the "Victor" Traps. The valve and seat are of steam bronze, the float is copper of the finest quality; other inside parts are brass, while body and cover are semi-steel.

FOR LOW PRESSURE AND VACUUM RETURN LINES



"Victor" Heavy Duty Steam Trap with Outside Thermostatic Air By-pass

The "Victor" Trap is admirably adapted for use on vacuum return lines, ahead of a vacuum pump. When used for this service, it is furnished with a thermostatic air by-pass. This thermostatic air by-pass is outside of the Trap, and is placed in a small pipe connecting the dome of the Trap to the plug over the main valve.

Prices and capacities on next page.

"VICTOR" LOW PRESSURE STEAM TRAP
(FOR PRESSURES FROM 0 TO 20 LBS.)

Accessibility

The inside parts are all attached to the cover and may be removed intact to the work bench or to some light open space by simply lifting off the cover, without breaking any pipe connections. The empty body of the Trap remains in place, with pipe connections undisturbed, so that easy access is provided to the inside of the Trap for inspection and cleaning.

All working parts are standardized and interchangeable, and easily renewed. It is never necessary for any "Victor" Trap to be out of service for the need of parts.

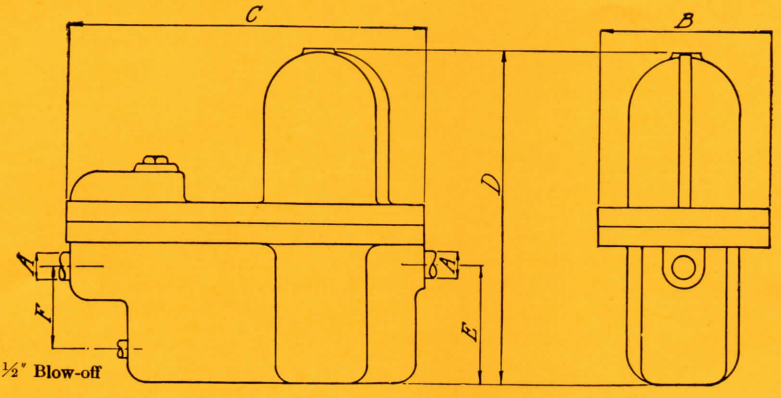
"Victor" Steam Traps

List Prices, Weights, Capacities, Dimensions—In Inches

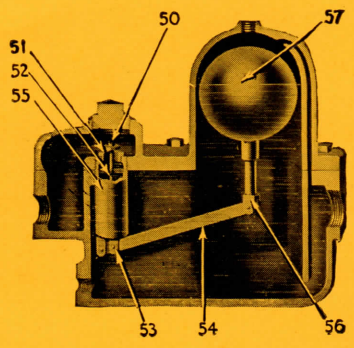
Size Number of Trap		40	41	42	43	44	45	46	47	48	49
Pipe Size of Inlet and Outlet		½	¾	1	1¼	1½	2	2	2½	3	3
List Price—Including Air Vent		$27.00	$28.00	$39.00	$47.00	$60.00	$80.00	$100.00	$130.00	$160.00	$180.00
Net Weight in Pounds		30	30	45	55	75	85	110	165	190	225
Code Word		Kayak	Keyrt	Kirni	Kotto	Kreut	Kymog	Krypt	Kuklu	Kagol	Klapt
Pounds of Water Discharged per Hour at Differential Gauge Pressures of	1 Lb.	1125	1125	2020	3040	3700	6880	9550	11,400	14,580	19,920
	3 Lbs.	1945	1945	3495	5260	6400	11,900	16,520	19,720	25,220	34,460
	5 Lbs.	2500	2500	4500	6770	8250	15,340	21,290	25,420	32,510	44,420
	7 Lbs.	2925	2925	5250	7900	9620	17,885	24,830	29,640	37,900	51,790
	10 Lbs.	3540	3540	6360	9575	11,650	21,670	30,080	35,910	45,920	62,745
	12 Lbs.	3825	3825	6865	10,335	12,580	23,390	32,470	38,760	49,570	67,725
	15 Lbs.	4340	4340	7795	11,735	14,280	26,555	36,860	44,000	56,275	76,890
	18 Lbs.	4770	4770	8565	12,890	15,690	29,170	40,490	48,335	61,820	84,460
	20 Lbs.	5015	5015	9000	13,555	16,500	30,685	42,590	50,845	65,025	88,840
B—Width		6½	6½	7¾	8½	9½	10¼	11	12¾	14	14
C—Inlet and Outlet Over All		9⅝	9⅝	12¾	13¾	15¾	17⅞	19¾	21¾	23¼	24
D—Height		9¼	9¼	11¾	12¾	14½	15¼	17¾	19½	21¼	23¼
E—Center Inlet and Outlet to Bottom		4	4	5	5⅛	5½	5½	6⅜	6½	7¾	8½
F—Center Blow-off to Outlet		3	3	4⅛	4⅛	4⅛	4⅜	5⅛	5¼	6⅞	7

Water gauge suitable for all sizes, List $2.70. Code word, "Fauge." Water gauges not furnished unless specified.

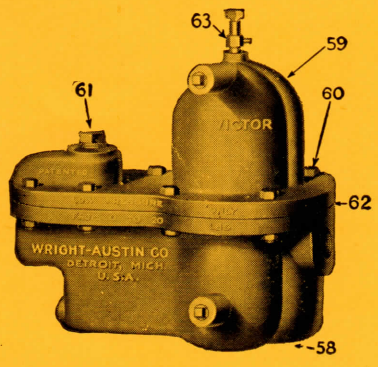
Outside Thermostatic Air By-pass, including connections as illustrated on Page 225, for all sizes, List Price—$8.00.



PARTS FOR "VICTOR" LOW PRESSURE STEAM TRAP



Eight Interior Parts

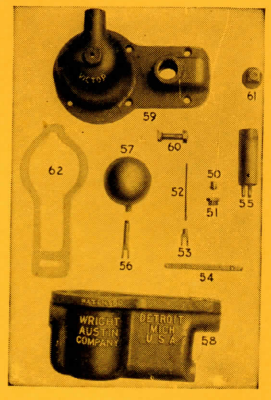


Six Exterior Parts

Valve Assembly Unit

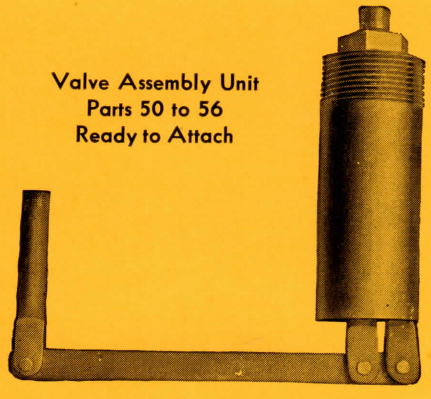
- 50—Valve
- 51—Seat
- 52—Stem
- 53—Clevis and Pin
- 54—Lever
- 55—Tube Machined and Pin
- 56—Swivel and Pin

57—Float



58—Body
59—Cover
60—Bolts and Nuts
61—Plug (Test)
62—Gasket
63—Air Vent

"Victor" Traps Need Never be Out of Service or Discarded, for All Parts are Standardized and May be Renewed Indefinitely



Valve Assembly Unit
Parts 50 to 56
Ready to Attach

You can renew practically as one piece, all the inside working parts of your "Victor" Steam Trap, by simply lifting off the cover.

The entire inside working parts may be obtained, factory assembled and tested, all complete and ready to attach to Trap as a single unit. This is called the "Valve Assembly Unit" as shown above and comprises parts 50 to 56 (except float, which may be included when desired).

Time is saved by ordering the "Valve Assembly Unit" complete rather than separate parts, because there is no fitting together and adjusting of the new parts with the old worn parts.

When the "Valve Assembly Unit" is renewed intact, whatever is usable of the parts removed may be laid away for future spares.

To put in the new "Valve Assembly Unit," you do not need to remove the Trap, nor disconnect the inlet and outlet pipe connections. It is only necessary to—(1) Remove the cover from Trap to work bench vise, detach float—unscrew old Valve Assembly from cover. (2) Screw new Valve Assembly into cover—attach float to it—replace cover on Trap. This done, your Trap is as good as new, for all wearing parts are actually new and will give you another lifetime of usefulness.

Be sure to renew valves and seats in pairs, or complete sets. A new seat on an old valve, or a new valve on an old seat, is unlikely to be a perfect fit, resulting in soon wearing out the new part.

In replacing valves and seats, and other parts, you simply lift off the cover. It is not necessary to take out the Trap, nor disconnect the inlet and outlet pipe connections.

Of course the float and any separate parts can be furnished if desired.

Parts for former "Victor" Trap, Series No. 1 to 8, No. 10 to 18, and No. 20 to 28 inclusive, can be furnished as usual.

When ordering Parts be sure to give:

1—Name and number of Part or Parts.
2—Size number of Trap.
3—Mention the parts are for a "Victor" Trap.

NOTE—Ask for special circular on "Victor" Trap parts which contains prices and maintenance information.

"EMERGENCY" 3-VALVE STEAM TRAP

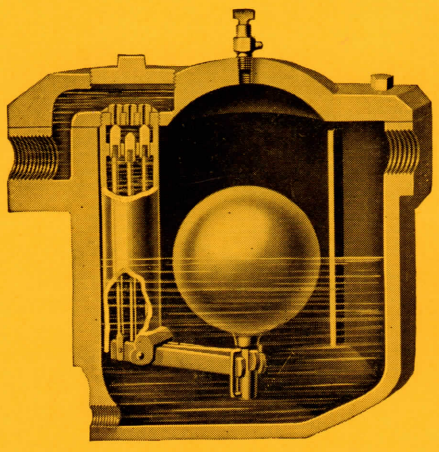


Fig. 1
Showing position of No. 1 Valve open for normal conditions.

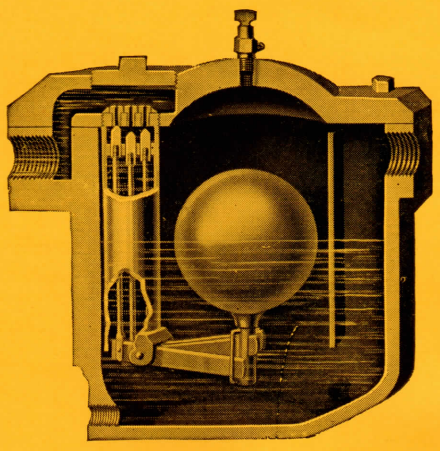
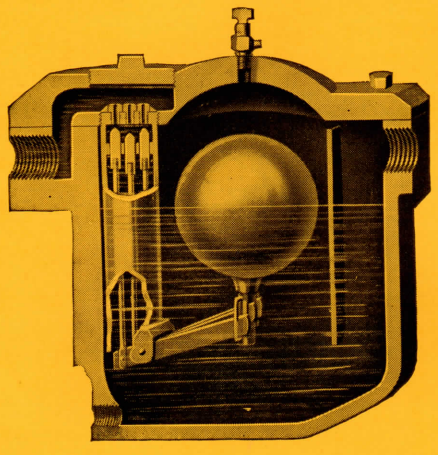


Fig. 2
No. 2 Valve opens wide when the flow exceeds capacity of No. 1 Valve.

Pressure range 0 to 200 lbs. without change of valves and seats, or any adjustment.

Horizontal—Straight-way inlet and outlet pipe connections.



The discharge tube is submerged in 4" to 7" of water according to size of trap, thus providing a deep and perfect water seal.

Fig. 3
Then No. 3 Valve opens, giving full emergency capacity of Trap.

This Trap Is Practically Three Traps in One

By each valve opening wide in turn, as needed, in One-Two-Three order, there are accomplished four great advantages in one simple, compact Trap:

1—Perfect adaptation for any working pressure. No change of parts or adjustments for any working pressures 0 to 200 lbs.

2—Enormous discharge capacity due to the use of three valves—equal to that of three or more ordinary Traps.

3—Automatic regulation of the Trap to any load, heavy or light.

4—Almost complete elimination of throttling effect on valves and seats.

The "Emergency" Trap operates on the principle of three separate units, by putting one valve after another into service as needed to discharge the amount of condensate flowing to the Trap, each valve acting as a separate unit. Or, all three valves will instantly open wide for emergency slugs or floods of condensation. When the rate of condensation decreases and the water level in the Trap recedes, the valves are closed steam tight, one at a time.

Thus, the Trap is automatically adjusted to any degree of load, and, as the amount of water every Steam Trap must handle usually varies greatly from one extreme to another, it will be seen that the three valves of the "Emergency" Traps are naturally adapted to all conditions of load by the fact that they open and close progressively.

This also has an important effect on the capacity of the Trap at different pressures. It will be observed in the table on page 230 that the capacity of the "Emergency" Traps increase in regular progression as the pressure is increased. This is a distinct and unique advantage of the "Emergency" Trap.

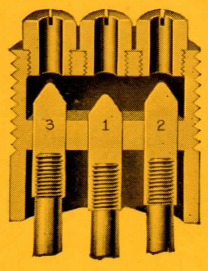
On account of the three-valve design giving the "Emergency" Trap much greater capacity than many Traps, it is very often possible to use an "Emergency" Trap which is smaller (measured by size of inlet and outlet) than other makes required for the same service. This frequently means a considerable saving by purchasing "Emergency" Steam Traps.

"EMERGENCY" 3-VALVE STEAM TRAP

Operation

The three principal positions of the Trap in the course of operation are shown by cuts on page 228 and the details of the valves are shown in cuts on this page.

The valves are controlled by the 3-step stirrup attached to the float. Unless held open by the buoyancy of the float, the weight of the levers plus the pressure in the Trap will keep the valves closed. When each valve operates, or leaves its seat, it opens practically wide without wire drawing or throttling effect, greatly reducing the wear on the valves and seats, and insuring steam tight valves for a long period.



Valves and Valve Seats of "Emergency" Trap—Also Shows Guide Bar for Centering Each Valve.

The float has a straight, direct pull on each valve separately, to open them in the 1-2-3 order, by means of the levers. Steam pressure within the Trap holds each valve tightly closed against the seat before discharging.

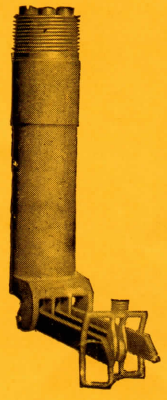
As the condensate flows into the Trap raising the water level, the float is more deeply submerged momentarily, by the steam pressure holding each valve shut, until the rising water level within the Trap increases the buoyancy or power of the float sufficiently to overcome the steam pressure against each valve—and open it with a slight jerk.

The instant the valve leaves its seat, the resistance on the float is released so that it then rises higher out of the water, thus quickly pulling the valve wide open, without throttling effect or wire drawing.

The same advantage is obtained in the closing operation. When nearly touching the seat, the steam pressure behind the valve slaps it shut quickly, practically eliminating wire drawing.

On extremely light service where there is not enough condensation to keep one valve open all the time, the valve will open and shut alternately, discharging small amounts of condensation intermittently, although continuously draining the device or pipe to which it is attached. This action takes place because the valves open and close on a very small variation of the water level within the Trap.

By continuously removing all condensation, steam is maintained at its highest temperature and the apparatus at top heat.



Tube Assembly. A Simple Arrangement of Stirrup, Valve Levers and Tube Containing the Valves.

Construction

The illustration below shows the complete but simple, inside working parts of the "Emergency" Steam Trap.

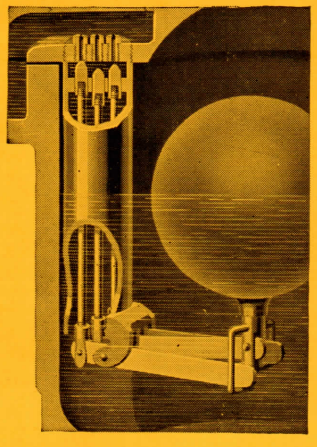
The lever which operates the center or Number 1 valve is fastened to the stirrup and moves rigidly with the float which is attached to the top of the stirrup. The levers attached to the outside valves Number 2 and Number 3, each have some lost motion in the side slots of the stirrup, which is less in case of valve Number 2, than it is in the case of valve Number 3. As the float rises after opening valve Number 1, which is fastened to the stirrup, it opens valve Number 2 at a slightly later interval, due to the lost motion in the stirrup surrounding the lever connected to this valve, and at a still later interval, opens valve Number 3, through its lever and the lost motion in Number 3 portion of the stirrup. This is an exclusive feature of the Wright-Austin "Emergency" Trap which makes it practically three Traps in one.

A round seamless, strong, special high pressure float is used in the "Emergency" Trap. Traps are so designed that floats do not become dented during shipment or in actual operation.

Accessibility

Easy access is provided to the inside of the Trap for inspection and cleaning, without breaking any pipe connections.

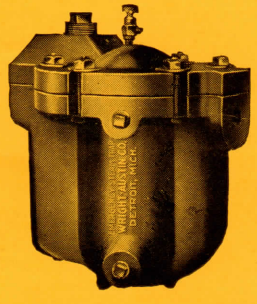
All inside parts are attached to the cover and may be removed intact to the work bench or to some other light open space by simply lifting off the cover. The empty body of the Trap remains in place, with pipe connections undisturbed.



Showing Movement of 3-Step Stirrup Operating the Discharge Valves in One-Two-Three Order.

In addition to this, the valve seats are easily reached by simply unscrewing the test plug in the cover, which is located directly over them; then they may be removed with an ordinary screwdriver.

All working parts are standardized and interchangeable, and easily renewed. It is never necessary for any "Emergency" Trap to be out of service for the need of parts.



"EMERGENCY" 3-VALVE STEAM TRAPS

Chrome Steel Valves and Seats

The valves and valve seats are genuine chrome steel—already well known to most engineers as the toughest steam metal yet discovered for withstanding high velocities and erosion.

Deep Water Seal

In operation the valves of the Trap are closed while the lower end of the discharge tube is still submerged in from 4″ to 7″ of water—according to the size of the Trap—forming a deep and perfect water seal, which prevents any possible escape or waste of steam. (Refer to illustrations on page 228.)

The "Emergency" Trap of itself is non-air binding, and will successfully digest the air from steam separators, headers, etc., without an air vent when placed at lowest point of drainage, so that the water is not forced up to the Trap.

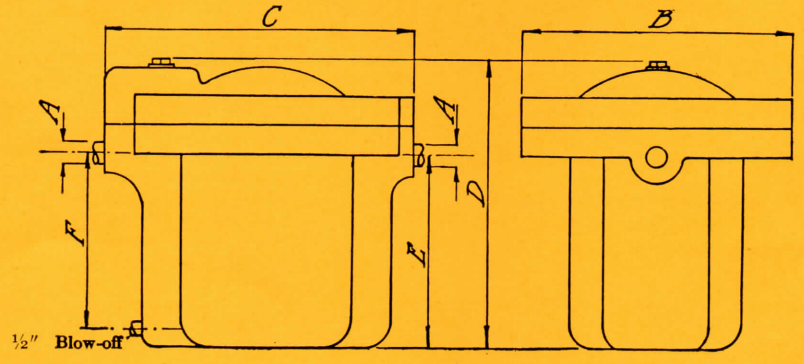
When draining heating systems, blast coils, or receptacles which collect air, it is advisable to use an air vent on or near the Trap to facilitate quick elimination of the accumulated air from the system. A small air vent is regularly furnished with the Trap.

"Emergency" Steam Traps

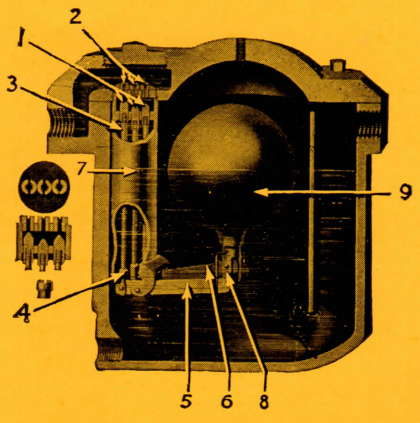
List Prices, Weights, Capacities, Dimensions—In Inches

Size Number of Trap		30	31	32	33	34	35	36	37	38	39
Pipe Size of Inlet and Outlet		½	¾	1	1¼	1½	2	2	2½	2½	3
List Price—Including Air Vent		$27.00	$28.00	$39.00	$47.00	$60.00	$80.00	$100.00	$130.00	$160.00	$180.00
Net Weight in Pounds		40	40	60	75	90	105	125	185	220	275
Code Word		Faced	Fagot	Fatal	Flink	Feign	Fichu	Fidge	Firtz	Flord	Flake
Pounds of Water Discharged per Hour at Differential Gauge Pressures of	10 Lbs.	900	900	2000	2400	3100	4000	5500	7000	11,500	16,100
	20 Lbs.	1160	1160	2500	3200	4050	5960	7800	10,300	16,500	22,800
	30 Lbs.	1400	1400	2900	3700	4800	7000	9300	12,400	20,200	28,000
	40 Lbs.	1560	1560	3200	4200	5300	7800	10,500	13,800	22,600	31,500
	50 Lbs.	1750	1750	3500	4500	5700	8400	11,300	15,000	24,900	34,800
	75 Lbs.	2000	2000	4000	5100	6400	9500	13,100	17,400	29,200	41,000
	100 Lbs.	2100	2100	4400	5600	7100	10,400	14,400	19,200	32,500	45,900
	125 Lbs.	2200	2200	4700	6000	7600	11,200	15,600	20,800	35,800	49,800
	150 Lbs.	2300	2300	4900	6300	8100	12,000	16,700	22,400	38,000	53,700
	175 Lbs.	2400	2400	5100	6700	8600	12,800	17,800	23,900	40,700	57,600
	200 Lbs.	2500	2500	5300	7000	9000	13,700	19,000	25,500	43,500	61,500
B—Diameter of Cover		7¾	7¾	9	10	11¼	11¾	12¾	14¼	15⅛	16½
C—Inlet to Outlet Over All		9½	9½	11¼	12	12¾	13¾	15¼	16½	18	19½
D—Height		9⅝	9⅝	11⅞	12⅝	13⅜	13⅝	14⅝	16¼	17¾	19
E—Center Inlet and Outlet to Bottom		6	6	7¾	8¾	9	9⅜	10⅛	10¾	11½	12¼
F—Center Blow-off to Outlet		4¾	4¾	6½	7¼	8	8¼	9	10	10	10¾

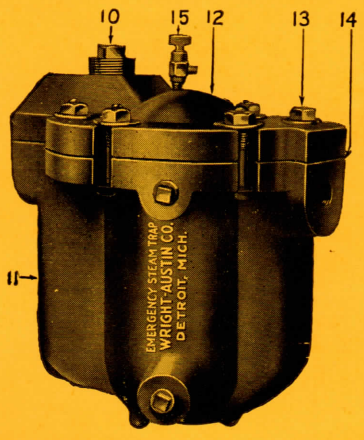
Water gauge suitable for all sizes, List $2.70. Code word, "Fauge." Water gauges not furnished unless specified.



PARTS FOR "EMERGENCY" STEAM TRAP



Nine Interior Parts

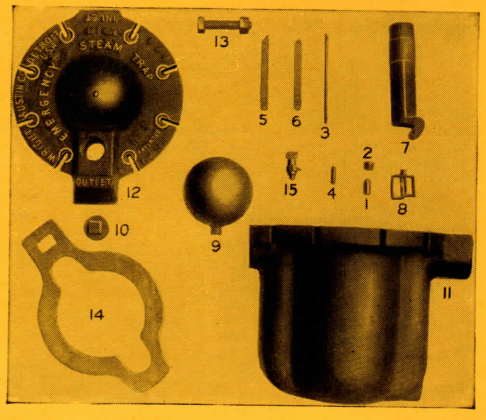


Six Exterior Parts

Tube Assembly Unit

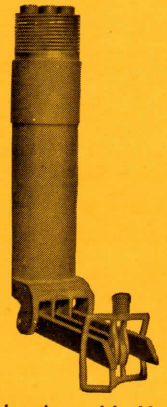
1—Valves
2—Seats
3—Stems
4—Clevises and Pins
5—Outside Lever
6—Center Lever
7—Tube Machined and Pins
8—Stirrup and Pin

9—Float



10—Plug (Test)
11—Body
12—Cover
13—Bolts and Nuts
14—Gasket
15—Air Vent

"Emergency" Traps Need Never be Out of Service or Discarded, for All Parts are Standardized and May be Renewed Indefinitely



Tube Assembly Unit Parts 1 to 8 Ready to Attach.

You can renew practically as one piece, all the inside working parts of your "Emergency" Steam Trap by simply lifting off the cover.

The entire inside working parts may be obtained, factory assembled and tested, all complete and ready to attach to Trap as a single unit. This is called the "Tube Assembly Unit" as shown at the left, and comprises parts 1 to 8 (except float, which may be included when desired).

Time is saved by ordering the "Tube Assembly Unit" complete rather than separate parts, because there is no fitting together and adjusting of the new parts with the old worn parts.

When the "Tube Assembly Unit" is renewed intact, whatever is usable of the parts removed may be laid away for future spares.

To put in the new "Tube Assembly Unit," you do not need to remove the Trap, nor disconnect the inlet and outlet pipe connections. It is only necessary to—

(1) Remove the cover from Trap to work bench vise, detach float—unscrew old Tube Assembly from cover. (2) Screw new Tube Assembly into cover—attach float to it—replace cover on Trap. This done, your Trap is as good as new, for all wearing parts are ~~actually new and~~ will give you another lifetime of usefulness.

Be sure to renew valves and seats in pairs, or complete sets. A new seat on an old valve, or a new valve on an old seat, is unlikely to be a perfect fit, resulting in soon wearing out the new part.

In replacing valves and seats, and other parts, you simply lift off the cover. It is not necessary to take out the Trap, nor disconnect the inlet and outlet pipe connections.

Of course the float and any separate parts can be furnished if desired.

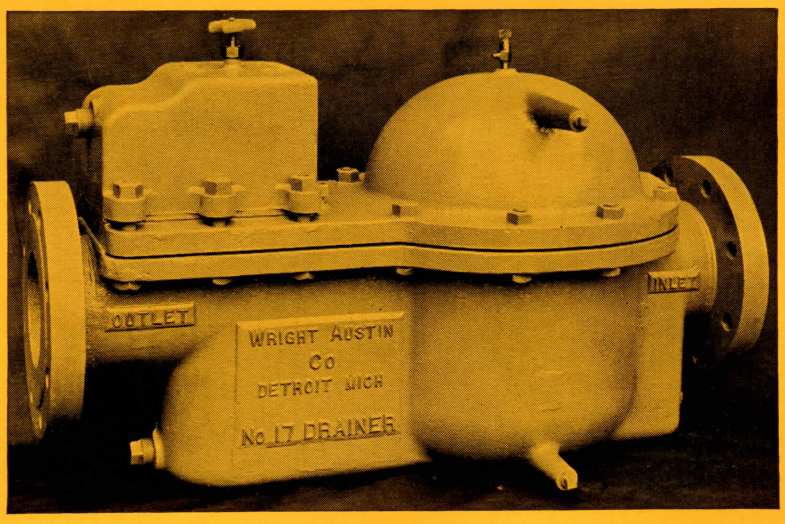
Parts for former "Emergency" Trap Series No. 1 to 8 inclusive, can be furnished as usual.

When ordering parts be sure to give:

1—Name and number of Part or Parts.
2—Size number of Trap.
3—Mention the parts are for an "Emergency" Trap.

NOTE—Ask for special circular on "Emergency" Steam Trap parts which contains prices and maintenance information.

WRIGHT-AUSTIN "DRAINER"



The "Drainer" Type of Steam Trap
This type handles huge volumes of condensate.
Illustration shows 5″ size.

The "Drainer" is made in sizes of 4″, 5″ and 6″ pipe connections, for condensation return lines of these sizes.

It is suitable for pressures up to 125 lbs.

A double-seated type of valve is used which provides the capacity necessary to handle the very large amount of liquid.

The valve is actuated by float and lever arrangement very similar to our "Victor" Trap. A deep water seal of several inches is maintained to completely submerge the outlet tube and valve.

Easy access to the valve and seat is provided by removal of the hood over the valve. Also all parts are attached to and removable by lifting off the cover without disturbing the inlet or outlet pipe connections.

Prices are cheerfully given.

However, as this "Drainer" is adapted to many special applications, it is possible for us to quote more accurately if your inquiry will advise:

1—Maximum pounds of condensate to be handled per hour.

2—Minimum pressure—also maximum pressure.

3—Pipe size.

4—Name of apparatus to be drained.

CORRECTLY DRAINING OIL SEPARATORS

Operating Non-Condensing

Oil Separators should be drained automatically for the reason that the efficiency, and even the usefulness of every Oil Separator depends upon the instant removal of the condensation and oil collected. Drainage by hand at intervals is generally unsatisfactory, unless continuously watched, for only an occasional oversight will permit the oil to accumulate in the Separator and overflow into the system, and thus defeat the purpose for which the Separator was installed.

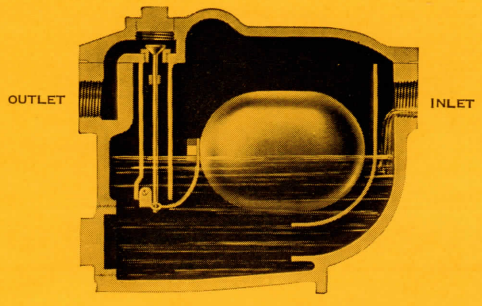
The best practical method of draining an Oil Separator is with a good automatic Trap of the closed float type. This Trap must have a large valve opening, so it will easily handle any thick, gummy oil from the Oil Separator without choking up the Trap.

For this service, the Wright-Austin Company manufactures two float Traps which have proven very satisfactory as "Emulsion" Traps. These are the "Victor" float Trap for the larger Separators, and the "Combination" Float Trap for the smaller Separators.

The excellent success of these two Traps for draining Oil Separators is the result of, (1) the large oversize valve openings, and (2) the fact that in both Traps the valve opens outward, lifting off the seat in the same direction as the outflowing oil and condensation, and does not open inward and against the flow as in most Traps.

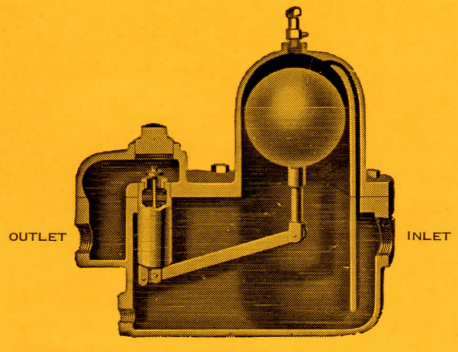
The "Victor" and "Combination" Traps are extremely simple and have but few parts, and are sturdily built for long life of reliable service. Today, thousands are in use as "oil and grease" Traps draining Oil Separators.

IMPORTANT—Use no Trap having smaller discharge capacities than given below, for a smaller Trap is very likely to choke up and cause the oil collected to overflow from the Separator back into the exhaust steam. Closed float Traps will give better results in draining Oil Separators than open bucket Traps.



"Combination" Trap

A strainer is not recommended on any Oil Trap.



"Victor" Trap

Recommended Sizes of Traps for Draining Oil Separators

Size of Oil Separator	1½" to 3½"	4" to 7"	8" to 12"	14" to 20"
Type of Trap	"Combination"	"Victor"	"Victor"	"Victor"
Size No. of Trap to Use (Order by Size Numbers)	No. 23-P	No. 42	No. 43	No. 44
Pipe Size in Inches	1"	1"	1¼"	1½"
Price	$16.00	$39.00	$47.00	$60.00
Code	Kroil	Kirni	Kotto	Kreut
Weight in Pounds	25	45	55	75
Capacity in Pounds of Water at Differential Pressure of 5 Lbs.	2500	4500	6700	8200
Face to Face of Inlet and Outlet in Inches	9¼"	12¾"	13¾"	15¾"
Width in Inches	5⅝"	7¾"	8½"	9½"
Height in Inches	7½"	11¾"	12¾"	14½"
Distance from Bottom to center of Inlet and Outlet, Inches	5"	5"	5⅛"	5½"

Our regular petcock air vent is furnished with each Trap.
Price for water gauge—all sizes—list $2.70. Code word "Fauge." Water gauges not furnished unless specified.
Every Trap is carefully tested before shipment and is fully guaranteed.

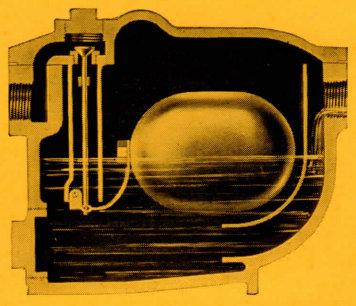
When ordering—Be sure to specify the Size No. of each Trap wanted.

If working pressure is above 20 pounds, then ask for our recommendations, and give us:

1—Pipe size of Oil Separator.

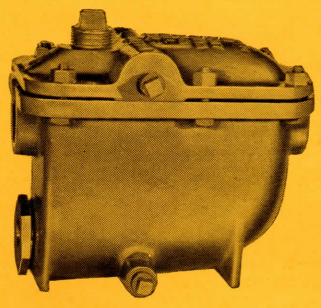
2—Highest working steam pressure on Separator.

TRAPS FOR DRAINING COMPRESSED AIR LINES



No. 23 Float Trap for compressed air service is designated No. 23-AC.

Pressure 0 to 125 lbs.



Compressed air is a gas but it differs from steam. Condensation occurs in both, but the two services differ in some very important ways, and it is in caring for these particular features that the Wright-Austin compressed air purifiers, separators and drainage traps have been prominently successful.

Compressed air purifiers, separators, and receivers should be drained automatically because the efficiency of the equipment depends upon the complete and instant removal of all condensate.

Drainage by a hand valve at intervals is generally unsatisfactory, unless very carefully watched, for only an occasional oversight will permit the condensate to accumulate and be carried over into the system with bad results. Or, if the hand valve should be opened too wide, or too long, the result will be a waste of expensive compressed air.

The closed float type of Trap is recommended on compressed air service for most installations for 3 reasons—

1. Handles the thick oily emulsion from cylinder lubrication better than any other type, because of the large outward opening valve.
2. Closed float Trap does not need priming —because the valve is closed when the Trap is empty.
3. Never gives trouble because of losing its prime.

Over a period of years our simple float Trap in the No. 23-AC pattern has been used on compressed air service under pressures 0 to 125 lbs. with very satisfactory success.

It embodies several features in its construction which makes it especially suited to this service, and has given dependable and efficient operation without any attention or upkeep for many years.

Never Needs Priming

This Trap never needs priming or filling with water by hand at any time.

When empty, without any water in the Trap whatever, the valve remains closed, so there is no leakage or waste of valuable compressed air during the starting up or empty period.

Also the Trap can be blown down for cleaning, and during the blow down period the Trap valve will be closed against leakage.

As shown in the illustration on this page, the valve in the No. 23-AC Trap opens outward, above the seat —in the same direction as the outgoing flow of condensate. For this reason a much larger orifice can be used which will promote a free flow of cold gummy oil in the water from the compressed air, without choking up the Trap.

The No. 23-AC Trap is an exceedingly simple float type and is made of proper materials for long and dependable life on compressed air service. It is convenient to install because of the straightline, horizontal pipe connections into body of the Trap. Also all working parts are removable by simply lifting off the cover without breaking the inlet and outlet pipe connections.

List Prices, Weight, Capacities, Dimensions—In Inches

Size Number of Trap		Float Type No. 23-AC
Pipe Size of Inlet and Outlet		¾"—*1" and 1¼"
List Price		$16.00
Net Weight in Pounds		25
Telegraphic Code		Krair
Discharge Capacity in Lbs. of Water per Hour at Differential Gauge Pressures of—	40	2650
	125	3560
Inlet to Outlet Overall, Inches		9¼"
Width, Inches		5⅝"
Height, Inches		7½"
Center Inlet and Outlet to Bottom, Inches		5"

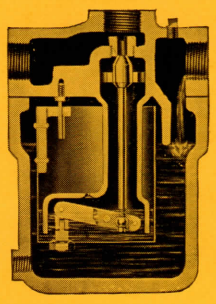
*The No. 23-AC Trap is made with three sizes of pipe connections. The 1" connections are furnished as standard unless either the ¾" or the 1¼" connections are specified.

All Traps for compressed air are valved for 125 lbs. working pressure, unless a lower pressure is specified on the order.

When ordering be sure to specify:

1—Size Number of Traps.
2—Pipe size desired on each Trap.
3—Maximum working pressure for each Trap.
4—Mention that Traps are for compressed air service.

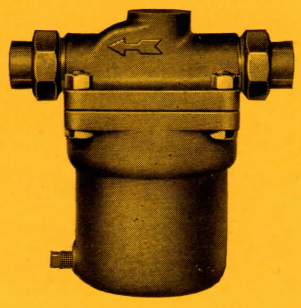
TRAPS FOR DRAINING COMPRESSED AIR LINES



With screwed connections, pipe size is ¾".

No. 50 "Airxpel" Bucket Trap for compressed air service is designated No. 50-AC.

Pressure 0 to 250 lbs.



With union connections, pipe size is ½".

Regularly furnished with ½" union connections but may be supplied with ¾" screwed connections when specified on order.

The open bucket type of Trap is suitable on installations where the lubricating oil has been separated out of the compressed air. Or, where there is no oil in the condensate. When the condensate contains oil, a float Trap is recommended.

For those who prefer the open bucket type of Trap for draining compressed air pipe lines and equipment, the "Airxpel" bucket Trap is successful.

The most popular size for compressed air drainage is the No. 50 which is priced and dimensioned in the table below. Other sizes, described in the first part of this book are also satisfactory, except the No. 051 size which is not furnished for compressed air service.

All Bucket Traps Must Be Primed

This applies to all bucket Traps alike, because when empty or nearly so, the Trap valve remains open.

All types of bucket Traps when used on compressed air service must be primed by filling them with water before turning the air pressure on them. The water is necessary to close the Trap valve before starting, because there is seldom enough water in the compressed air lines to fill the Trap at once, and close the valve.

Otherwise, if the Trap is not primed and the Trap valve is allowed to remain open, considerable compressed air may blow through the Trap and be wasted, before sufficient water is accumulated in the Trap to float the bucket and close the valve for regular operation.

Also when the blow-off on a bucket Trap is opened to blow dirt out of the Trap, or if the Trap should be taken out of the line for any reason, it should likewise be filled with water when again installed to start it functioning properly.

When "Airxpel" Traps are desired for draining compressed air, the order to the factory must specify that the Traps are "for compressed air."

List Prices, Weight, Capacities, Dimensions—In Inches

Size Number of Trap	Bucket Type No. 50-AC
Pipe Size of Inlet and Outlet	*½"—¾"
List Price	$11.00
Net Weight in Pounds	13
Telegraphic Code	Quade
Discharge Capacity in Lbs. of Water per Hour at Differential Gauge Pressures of— 40	285
125	470
Inlet to Outlet Overall, Inches	*7¾"—6"
Width, Inches	4¾"
Height, Inches	7⅜"
Center Inlet and Outlet to Bottom, Inches	6"

NOTE—*Pipe size and dimension marked with asterisk are furnished unless otherwise specified on order.

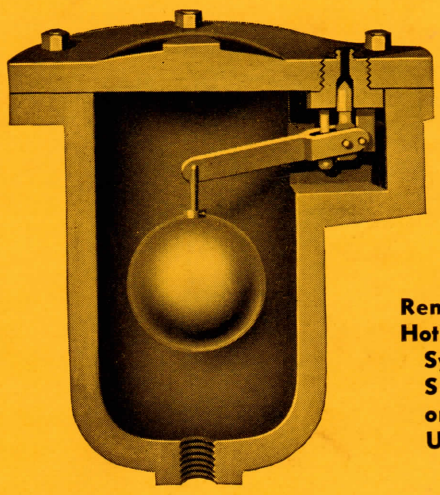
The No. 50-AC Trap is made with two sizes of pipe connections. The ½" connections which have unions are furnished as standard unless the ¾" connections which are screwed are specified.

All Traps for compressed air are valved for 125 lbs. working pressure, unless a different pressure is specified on the order.

When ordering be sure to specify:

1—Size Number of Traps.
2—Pipe size desired on each Trap.
3—Maximum working pressure for each Trap.
4—Mention that Traps are for compressed air service.

WRIGHT-AUSTIN AIR RELIEF TRAP



Suitable for Removing Air from Hot Water Heating Systems, Water Supply Lines, or Other Liquids Under Pressure.

The Wright-Austin Air Relief Trap is extensively and very successfully used on hot water heating systems, closed water tanks and receivers, water supply lines, centrifugal pumps, etc.

It is positive in action, entirely dependable and requires no attention. It is extremely simple and well built and is fully guaranteed. It operates under any working pressure up to 150 pounds.

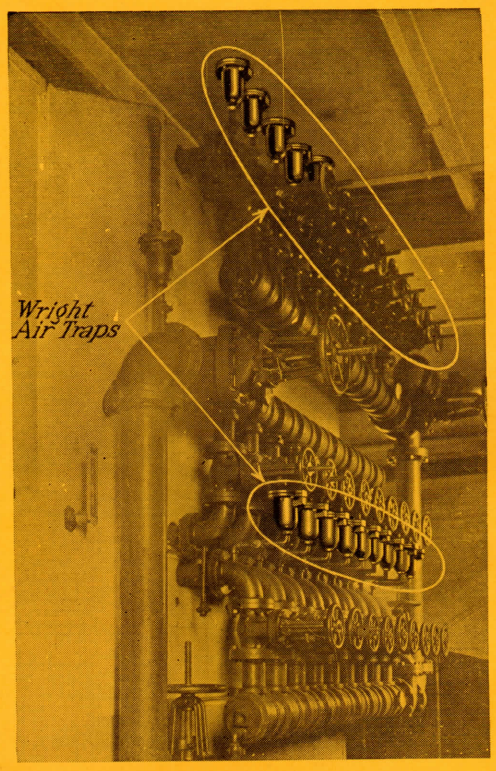
When desired it is furnished with a whistle for sounding an alarm when the water reaches a certain level in a tank or receiver.

Dimensions—In Inches

Size of Connections	Diameter	Height	Wgt. Lbs.	List Price	Code Word
¾	6	7½	15	$11.00	Urabe

Trap can be furnished tapped for ½″ connection if specified, without extra charge. Both ½″ and ¾″ carried in stock.

Several Hundred Air Traps are used on Hot Water Heating System in Plant of Ford Motor Company, Detroit



Air Traps on Oil Piping Feeding Oil Quenchers

Wright-Austin Expansion Air Valve

For speeding up sluggish steam heating systems—a positive, simple and reliable valve which will provide quick relief from air binding and air pockets in steam heating systems, steam traps, unit heaters, receivers, etc.

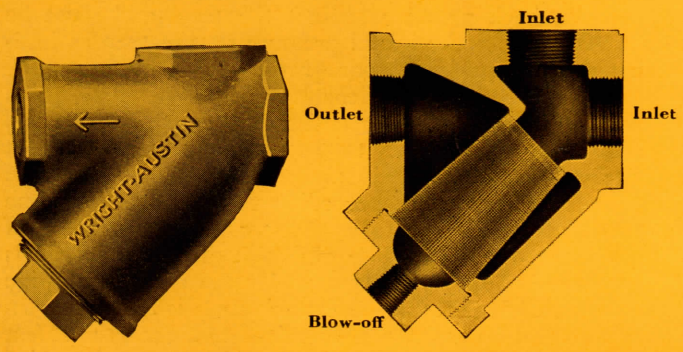
When cool the valve remains wide open, until closed by temperature of steam entering the brass tube. The tube then expands upward, closing against the valve at the top; the valve being held in a fixed position by the side rods which do not expand.

The valve may be adjusted and locked by a thumb nut. There is nothing to crystallize or wear out, and it will give a lifetime of dependable service.

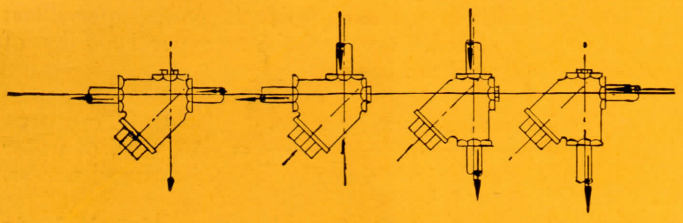
It is suitable for pressures up to 50 lbs.

Connection	⅜″
Length	11¼″
Weight	1 lb.
Price	$3.00
Code	Wegeb

WRIGHT-AUSTIN STRAINERS FOR STEAM, AIR, GAS, OIL OR WATER



The "Tuway" Strainer



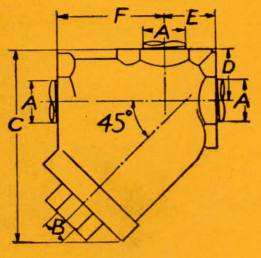
No need to bother whether the job requires straightway or angle Strainers. Just send out the "Tuway"—it's the universal Strainer.

The unusual advantage of the "Tuway" Strainer, is that on the job it may be connected up any one of the four ways shown above —straightway or angle, horizontal or vertical, whichever suits the piping or location.

The two inlets, at right angles to one another, either of which may be used and the other one plugged, multiplies its usefulness and convenience.

The construction of the "Tuway" Strainer is extremely sturdy, simple and compact and is made with a cast semi-steel body.

The screen, as regularly furnished, is made of perforated sheet brass having 400—$\frac{1}{32}$" holes per sq. in. Because of its cylinder shape, the open area of the screen is several times greater than the area of the pipe connection. The screen is securely held at both ends. The perforation of the screen can be changed to suit special requirements upon request.



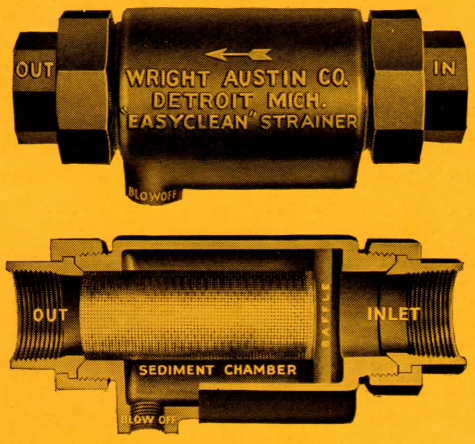
The "Tuway" Strainer may be conveniently cleaned under pressure by flushing through the blow-off.

The regular semi-steel "Tuway" Strainers are suitable for pressures up to 300 lbs.

List Prices, Weights and Dimensions—In Inches

Size No.	Pipe Size of Inlet and Outlet A	Blow Off B	C	D	E	F	Wt. Lbs.	List Price	Code Word
10	½	½	4½	1¼	1¼	2⅞	4	$3.00	Targe
10	¾	½	4½	1¼	1¼	2⅞	4	3.50	Tends
12	1	½	6⅛	1⅝	1⅝	3⅜	10	4.00	Thumb
12	1¼	½	6⅛	1⅝	1⅝	3⅜	10	5.00	Taste
14	1½	¾	7½	2⅛	2⅛	3¼	17	8.00	Trast
14	2	¾	7½	2⅛	2⅛	3¼	17	10.00	Twarm

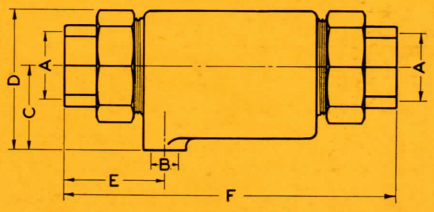
All sizes carried in stock.



The "Easyclean" Strainer

Special features of the "Easyclean" Strainer

1. Easy to connect up as a union in a pipe line.
2. Easy to keep clean.
3. Dirt pocket in the bottom of the Strainer collects dirt and scale before reaching the screen.
4. Scale and dirt held in dirt pocket are easily discharged through blow-off.
5. This prolongs intervals between cleaning.
6. When cleaning becomes necessary, just open the unions and slip out the Strainer. The screen is then easily removed—cleaned and replaced.
7. Very compact, symmetrical streamline appearance in the piping.
8. The screen is securely held at each end.
9. Has large screen area—openings are several times greater than size of pipe.
10. Screen is perforated sheet brass having 400—$\frac{1}{32}$" holes per square inch.
11. Body is cast semi-steel, suitable for working pressures up to 250 lbs.



List Prices, Weights and Dimensions—In Inches

Size No.	A	B	C	D	E	F	Wgt. Lbs.	List Price	Code Word
½	½	⅜	1 3/16	2	1 11/16	3	2½	$2.00	Talon
¾	¾	⅜	1½	2½	2⅛	3 7/16	3	2.20	Taper
1	1	½	1⅝	2 13/16	2 5/16	3 13/16	3½	3.30	Tenon
1¼	1¼	½	2 1/16	3 7/16	2 7/16	8⅛	5	4.60	Terse
1½	1½	½	2⅜	4	2 9/16	9⅛	7	5.50	Tonic
2	2	½	2¾	4¾	2¾	10⅝	10	7.00	Trine

All sizes carried in stock.

HOW TO SELECT STEAM TRAPS

There is no one type or pattern of steam trap, which will successfully render the most efficient results under all the varying conditions of service as they actually exist in different steam plants; pressure, temperature, amount of condensate, whether it be a steady or an intermittent flow, and the kind of equipment to be drained—all should be considered in the selection of the proper trap for an efficient installation.

Each of the different float and bucket patterns is especially adapted to a particular field of service in which it excels. It naturally follows that the apparatus thus drained will produce more efficient results whether it be steam mains, heating, drying or processing equipment.

For size, it is necessary to know the working steam pressure under which the trap is to operate, as well as the amount of condensate to be discharged at a given pressure.

The pressure and the amount of condensate to be handled are twin factors in determining the size of the trap.

When referring to pressures as used in connection with the capacity of steam traps, it always means the "differential" pressure, which is the difference between the pressure on the trap inlet, and the pressure on the trap outlet. Should you have 100 lbs. pressure on the inlet, with the trap discharging against a back pressure of 25 lbs., the net difference is 75 lbs., which is the differential pressure, and is the pressure basis for the capacity of the trap.

If the trap is to elevate the water it discharges, the elevation will be a back pressure on the trap and must be taken into consideration when determining closely the capacity and size of the trap. For most purposes it is sufficiently accurate to figure that each 2 ft. of height which the water must be elevated, is equivalent to 1 lb. back pressure against the trap, and must be deducted from the initial pressure on the trap as indicated in the preceding paragraph.

Tables are published elsewhere in this book, which will be of assistance in arriving at the proper capacity. Also complete capacity tables for the different traps at various pressures are given.

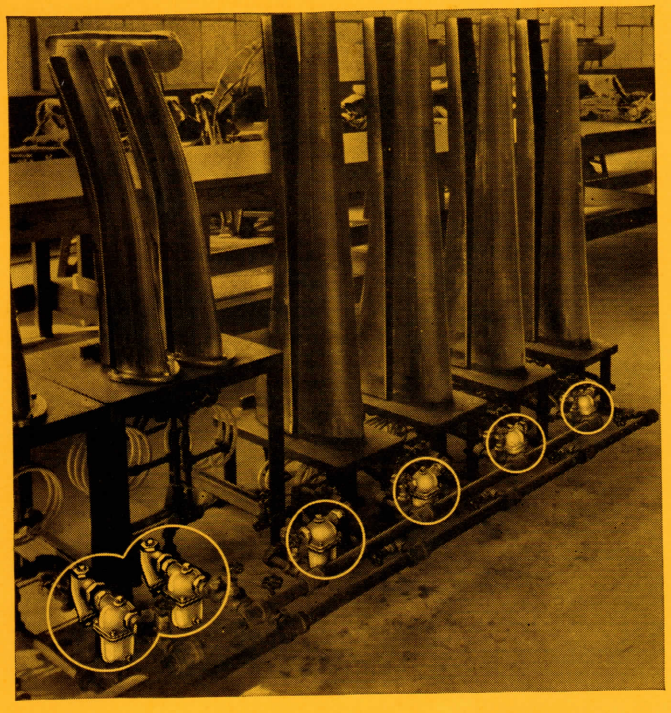
Do not buy a trap according to pipe size, for some traps have only 1/25th as much capacity as others of the same pipe size. The pipe size of a steam trap is no more indication of its capacity than is a large pipe on a small boiler. If the capacity needed is unknown and cannot be satisfactorily calculated, then the safest way is to select the trap having the largest capacity for the size of pipe desired.

Before purchasing, make this comparison of the different traps. Multiply the net price of the trap by 1000 and divide by the capacity in pounds per hour; the result will be the cost of the trap per 1000 lbs. of water discharged per hour.

$$\text{Thus} \quad \frac{\text{Price of Trap x 1000 lbs.}}{\text{Capacity in lbs. per hr.}} = \text{Cost of Trap per 1000 lbs. of water discharged per hr.}$$

Steam traps should be figured as to cost on the basis of the amount of work done, just as boilers are sold on a horsepower basis, or pumps on the basis of duty in gallons per minute. The cost per thousand pounds of water discharged per hour is the only common unit basis of comparison by which the cost of different makes of traps can be closely compared.

Placing the trap where most convenient is customary with "Airxpel" Traps, because of their light weight it is possible to hang them in the line like an ordinary straight-way valve.



For rapid drying and greatest production on this laundry equipment, the owners use a small individual trap on each unit.

INDIVIDUAL TRAP DRAINAGE VERSUS GROUP DRAINAGE

It is a fact frequently overlooked, that the innocent little steam trap in the drainage line from a piece of steam heated equipment, can actually exercise as much control over the production of the major equipment it is intended to serve, as a throttled valve on the main steam supply line.

Group drainage of two or more steam heated units into one trap does not give the highest heating efficiency in the equipment thus drained, and results in sluggish or intermittent operation, requiring a longer time to produce the work or heat desired.

Practical experience has proven that perfectly equalized pressure conditions do not exist in different steam coils or chambers, even though drawing steam from the same supply line. Pressure differences of a couple ounces, or a few degrees difference in temperature will unbalance the final discharge pressures and restrict the free flow of the condensate from the different units.

This variable condition may result from one or more causes, or from a combination of several, which will produce a fluctuation in the rate of condensation or heat transfer in different units, namely:

1—Variations of the stage of the heating cycle within the equipment.

2—Temperature differences of the material or air in contact with steam heated surfaces in the various coils or units being drained.

3—Difference in areas of heating surfaces or sizes of the units.

4—Differences in the condition of the heat transferring surfaces whether clean or encrusted with scale.

5—Longer or shorter distances of the units from the boiler.

6—Differences in the size of steam supply branch lines to the units.

7—Varying back pressures or "lift" in the drain pipes.

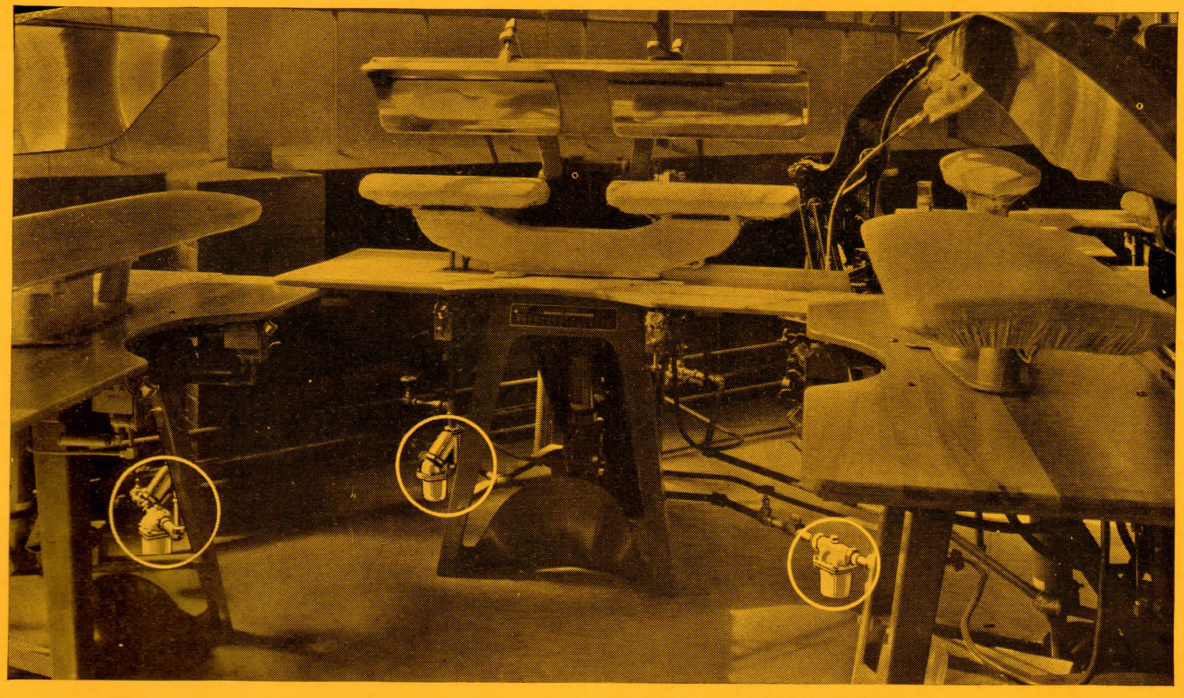
8—Location and size of steam traps.

9—Difference in distance of units from steam trap.

10—Improper arrangement of piping to trap.

Yet these are only some of the causes for a see-sawing or short circuiting effect in the multiple discharge lines to one trap, so do not connect more than one unit or coil to a trap, if you want to get the greatest amount of useful work out of your steam. This is the recommendation supported by every qualified authority.

Steam traps are now available in a wider range of sizes and prices than ever before, which are adapted for small or large heating apparatus. The price of an individual steam trap is insignificant compared to the cost of reduced production of the equipment it is intended to assist.



Clothes Pressing Machines individually trapped for best results.

INSTALLATION OF STEAM TRAPS

Assuming correct selection, then proper installation, will largely determine the results which your steam traps will give you.

Installation of a trap should be made in such a manner as to eliminate the possibility of any air pockets in the piping ahead of the inlet of the trap. Give your pipe lines ample pitch for gravity drainage, so air and water can easily reach the trap and be discharged.

Always install the trap below the lowest point to be drained.

Place the trap in an accessible location so it will be made easy for the operator to open the blow-off valve on the trap as often as may be necessary to discharge the dirt too coarse for the trap itself to digest.

The trap should also be located where it will be convenient for regular inspection.

Every trap must be set level, whether it hangs on the pipe line, or is supported on a base.

When steam is first turned on, open the blow-off valve for several minutes to thoroughly blow out all pipe lines. On new piping installations, every trap should be blown off several times daily for the first week after going into service, because of the large amount of pipe thread dope, scale and dirt, which accumaltes in a new piping system.

Probably the most frequent and annoying trap trouble is caused by dirt and pipe scale. The nature of its location makes the trap a logical catchall for debris of all kinds from the piping system.

For this reason, a strainer installed ahead of the trap is very advantageous in keeping dirt entirely out of the trap.

This helps to prolong the life of the trap valve. A strainer will prevent many trap troubles, and reduce maintenance.

For strainer details, please turn to page 237.

Never use a strainer ahead of a trap, which is draining steam separators, oil separators, or compressed air lines.

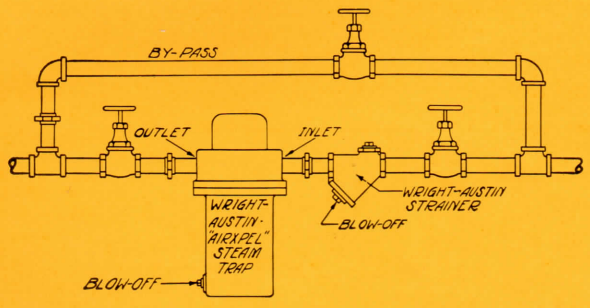
When it is suspected that a trap is leaking, one should make certain that it is steam which is escaping before deciding that the trap valves are leaking. Steam has a bluish tint, while re-evaporated condensate is white. This may be observed by opening the trycocks on a boiler, above and below the water level, and see the difference between steam and water when discharged under pressure.

Lifting Water with Steam Traps

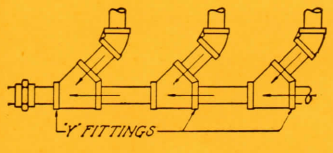
When discharging against a head of water, steam traps of the non-return type such as bucket and float traps, will lift the water discharged by them, a height of two feet for each pound of steam pressure on the inlet connection of the trap.

When using this factor the correct minimum pressure on the inlet of the trap should first be known or determined by putting a reliable pressure gauge on the trap inlet to accurately check the pressure at this point.

The initial pressure on the trap will not be the same as the steam supply line, in heating and process equipment because there is considerable pressure drop, therefore only the actual pressure on the trap itself will be effective to lift the water.



Typical piping arrangement with by-pass applicable to most all Traps. Blow-off connection is also recommended.

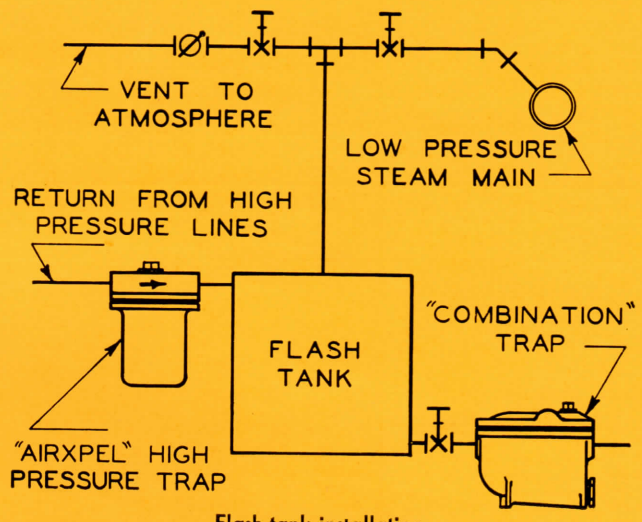


Always use "Y" connections as illustrated above, where two or more drains are grouped to one Trap. This prevents retarding the flow of condensation in some lines by others discharging, as occurs when tees are used instead of "Y" fittings.

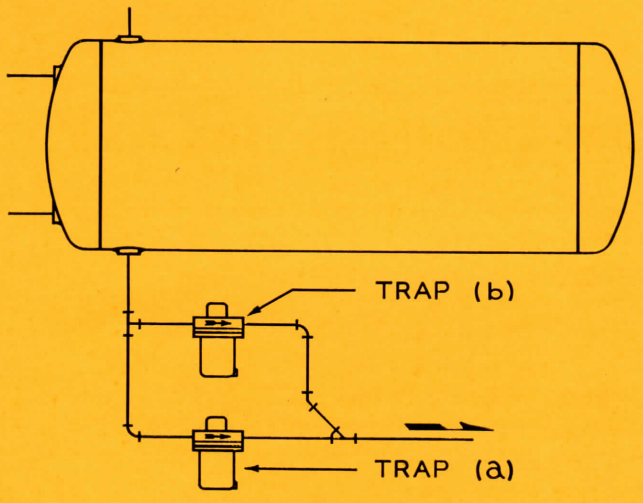
MODERNIZED HOOK-UPS INCREASE EFFICIENCY

Right—Taking advantage of the hot "flash" or vapors, from high pressure condensate, and making good use of it for heating, etc.

There are many plants, both small and large, where the valuable heat units in the flash can be conserved for useful work, and pay handsome dividends on the cost of the simple piping connections illustrated here.



Flash tank installation



Duplex Trap installation

Left—The duplex trap installation as illustrated has increased production on equipment originally having one large Trap.

By using two smaller Traps with more frequent operation, promotes circulation through the steam space in the heater or cooker, and consequently better drainage.

Trap (a) takes the normal load, but as the peak load exceeds its capacity, the condensate backs up and trap (b) comes into service and handles the overflow.

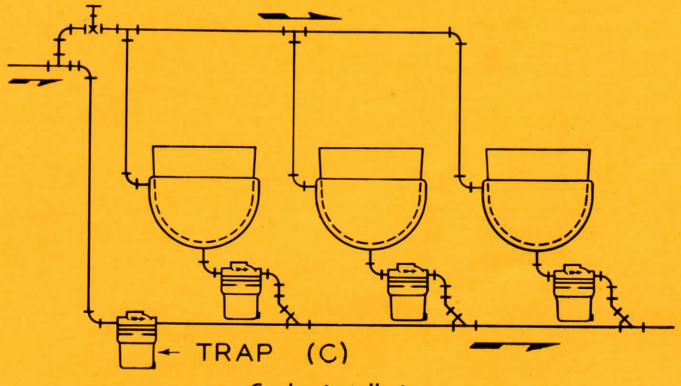
This method can be recommended with every assurance of improved results.

Right—A simple way to insure dry, hot steam for cookers, dryers or other steam heated process equipment.

Note the take-off for cookers from top of tee before end of the steam supply line, and then draining the end of the steam supply line by a suitable steam trap.

By-passing the accumulated pipe line condensate around the cookers, instead of forcing it through them, will considerably increase cooker production and efficiency.

Because the steam line is continuously drained, there will always be hot steam at the point of service.



Cooker installation

RADIATION AND HEATING SURFACE

Rates of Condensation from Heating, Drying and Cooking Operations

TABLE 1

Following table gives rates of condensation per lineal foot in bare steel pipe in a room temperature of 70° F., and natural movement of air.

This table has been computed from data in Kent's Mechanical Handbook.

Pipe Size In Inches	Steam Pressure in Lbs. per Sq. In. Gauge															Sq. Ft. of Surface Equivalent to 1 Lineal Ft. of Pipe
	1	2	4	6	8	10	20	30	40	50	75	100	125	150	200	
	Pounds of Water Condensed Per Hour, Per Lineal Foot of Pipe															
¾″	.11	.13	.14	.14	.15	.15	.16	.18	.20	.22	.26	.29	.32	.35	.40	.275
1″	.15	.15	.16	.16	.17	.18	.20	.23	.25	.27	.31	.35	.39	.42	.49	.345
1½″	.21	.21	.22	.23	.23	.24	.28	.33	.36	.39	.45	.50	.55	.60	.69	.497
2″	.24	.25	.26	.27	.27	.29	.33	.38	.42	.46	.54	.61	.68	.74	.81	.622
2½″	.30	.31	.32	.33	.34	.36	.41	.46	.51	.55	.65	.73	.81	.88	.97	.752
3″	.38	.39	.40	.41	.43	.44	.50	.56	.61	.66	.77	.86	.94	1.03	1.19	.917
4″	.46	.47	.48	.49	.51	.53	.61	.68	.76	.83	1.04	1.11	1.23	1.33	1.50	1.179
5″	.55	.56	.59	.60	.62	.64	.74	.83	.91	1.00	1.24	1.32	1.46	1.59	1.81	1.459
Per Sq. Ft. of Heat. Surf.	.34	.35	.36	.37	.39	.41	.47	.53	.59	.65	.73	.81	.90	1.00	1.15	

Determining the Capacity of Traps Needed for Steam Equipment

1. For **Radiation** and ordinary space heating, use the amount of condensation given after "per sq. ft. of heating surface."
2. For **Unit Heaters, Blast Coils, Drying Rooms,** etc., having forced air circulation by fans,—multiply quantities in above table by 5.
3. For **Drying Rolls, Calenders,** etc., for paper, textiles, chemicals, laundry equipment, etc.,—multiply quantities in above table by 5.
4. For **Water Heaters, Submerged Coils, Steam-Jacketed Equipment,** etc., containing water or other thin non-viscous liquids,—multiply quantities in above table by 6.

   (A)—For thicker and more viscous liquids, multiply by 4.

   (B)—Agitating or forcing movement of liquid over the heating surfaces—

   For thin liquids, multiply by 8.

   For thick liquids, multiply by 6.
5. For **Copper Coils** additional capacity is required—multiply above results by 1.75.
6. For **Evaporators, Vacuum Pans and Cookers** operated with a vacuum on the cooking chamber, our recommendations for suitable steam traps will be cheerfully given, by communicating the essential information to our District Representative, or to Detroit Office.

The above method of computing the capacity requirements for steam traps is given in this manner for simplicity, and while rather general, they will average sufficiently close in most applications for determining the capacity of the trap to use.

It is recognized there will be variations from these figures under some conditions, and for more specific recommendations, we suggest our Representatives or the Detroit office be given complete details.

At the start and during the "heating up" period, the cold surfaces condense steam much more rapidly, and produce temporarily an abnormal amount of condensation. In turn, this rapid condensation causes a pressure drop in the equipment, and likewise a much reduced pressure within the trap itself and just at the time it is given the greatest amount of condensation to handle. Therefore, consideration must be given these extremes of the heating up period.

Example:

What size trap will be needed for a water heater or cooker having coils containing 3000 ft. of 1″ steel pipe, to be operated at 10 lbs. pressure?

3000 ft. × .18 (above table) × 6 (paragraph 4) = 3240 lbs. of condensate per hour.

First checking the "Combination" Trap, we find the No. 23-T (page 221) has a capacity of 3540 lbs. and will be the first choice.

However, should these coils be copper, then we must add 1.75% of 3240 (paragraph 5) or 2430 lbs. to the capacity which will then total 5670 lbs. of condensate per hour. This will require the No. 42 "Victor" Trap (page 226), and on this service it is recommended the thermostatic air by-pass be supplied as shown on page 225.

TABLE 2

Condensation in 100 Feet of Covered Pipe in Pounds of Water per Hour

Figured for Pipe Insulated With 2″ Thickness of 85% Magnesia Covering

Gauge Pressure in Lbs. per Sq. In.	Diameter of Pipe to Be Drained in Inches											
	¾	1	1½	2	2½	3	4	5	6	8	10	12
1	2	3	3	4	4	5	6	7	8	11	13	15
2	2	3	3	4	4	5	6	7	8	11	13	15
3	2	3	3	4	4	5	6	7	9	11	14	15
4	2	3	4	4	4	5	6	7	9	12	14	16
6	3	3	4	4	5	5	6	7	10	12	14	17
8	3	3	4	4	5	5	6	8	10	12	15	17
10	3	3	4	4	5	5	7	9	11	13	15	18
20	3	3	4	5	5	5	8	10	12	15	18	21
30	3	4	5	5	6	7	9	11	13	16	20	24
40	4	4	5	6	6	8	10	12	14	18	22	26
50	4	4	5	6	7	9	11	13	16	19	24	28
60	4	5	5	6	7	9	12	14	17	21	26	30
70	4	5	6	7	8	10	13	15	18	22	27	32
80	5	5	6	7	8	11	13	16	19	23	29	34
90	5	5	6	7	8	11	14	17	19	24	30	36
100	5	5	7	8	9	12	15	18	20	25	31	37
125	5	6	7	8	9	13	16	19	22	28	35	41
150	6	6	8	9	10	14	17	21	24	31	38	45
175	6	6	8	9	10	15	18	22	26	33	41	49
200	6	7	8	9	11	15	19	24	28	35	44	51

Table 2 for covered pipe has been computed for condensation, also corrected for heat loss due to friction, the velocity being taken at 8000 ft. per minute, and the loss being figured for 3 inch pipe and larger, based on formulas in Kent's Mechanical Hand Book.

TABLE 3

Moisture in Steam Pipe Carried Over from Boilers or Other Source of Steam

Table Is Figured for 2½% Moisture, and Velocity of 8000 Ft. per Minute with 2″ Thickness of 85% Magnesia Covering on the pipe

Moisture Is Given in Pounds of Condensation per Hour

For long pipe lines, add for normal condensation at rate given in Table 2

Gauge Pressure in Lbs. per Sq. In.	Diameter of Pipe to be Drained in Inches											
	¾	1	1½	2	2½	3	4	5	6	8	10	12
1	2	2	6	13	18	25	43	68	100	173	270	388
2	2	2	6	13	18	28	45	73	105	180	285	410
3	2	3	8	13	18	28	48	78	110	193	300	433
4	2	3	8	13	20	30	50	80	115	203	318	455
6	3	4	10	15	20	33	58	88	128	223	348	500
8	3	4	10	15	23	35	63	98	140	245	380	545
10	3	5	10	18	25	38	68	105	150	260	410	590
20	4	6	15	25	35	53	93	143	210	358	563	808
30	4	8	18	30	43	68	115	180	260	453	713	1025
40	5	10	23	38	53	80	140	218	315	548	860	1235
50	6	10	25	43	60	95	163	255	370	640	1008	1445
60	7	13	30	50	70	108	185	293	423	733	1153	1653
70	8	15	33	55	78	123	210	328	475	823	1295	1860
80	10	15	38	60	88	135	233	365	525	913	1435	2063
90	10	18	40	68	95	148	255	400	578	1005	1580	2265
100	13	20	45	73	105	163	278	435	630	1093	1718	2468
125	15	23	53	88	125	195	333	523	758	1313	2065	2963
150	15	25	63	103	145	228	390	613	885	1533	2413	3463
175	18	30	70	118	168	258	445	698	1010	1750	2750	3950
200	20	35	80	133	188	290	500	785	1133	1960	3090	4438

From Standard Authorities

This table has been computed for 2½% moisture, and 8000 feet per minute velocity of steam, because these are average, normal conditions in steam power piping. To compute moisture for other than 2½%, divide the condensation given by 2½, and multiply by the required percentage of moisture. Similarly, to convert to another velocity, divide by 8000 and multiply by the required velocity in feet per minute.

The formula upon which the table is based is: C = 60AVWP where C = condensation in lbs. per hour; A = internal area of pipe in sq. ft; V = velocity in ft. per min.; W = weight of one cu. ft. of steam at the given pressure and P = the percentage moisture in the steam.

THE FIGURES IN THIS TABLE SHOULD BE MULTIPLIED BY A FACTOR OF SAFETY OF 5, to allow for slugs of water, when the table is used to determine the correct size of Steam Traps to handle condensation. **This figure is the result of many years of practical experience with drainage design on the part of the Wright-Austin Company.**

TABLE 4

Table for Converting Lineal Feet of Pipe to Square Feet of Surface

Lineal Ft. of Pipe Equivalent to 1 Sq. Ft. of Surface	Pipe Size	Sq. Ft. of Surface Equivalent to 1 Lineal Ft. of Pipe
3.63	¾″	.275
2.90	1″	.345
2.30	1¼″	.435
2.01	1½″	.497
1.608	2″	.622
1.329	2½″	.752
1.090	3″	.917
.955	3½″	1.046
.848	4″	1.179
.763	4½″	1.310
.685	5″	1.459
.576	6″	1.735
.501	7″	1.995
.442	8″	2.27
.397	9″	2.52
.355	10″	2.82

TABLE 5

Comparative Carrying Capacities of Different Sizes of Pipe

EXAMPLE: To get size pipe to serve a ½″ pipe and a ¾″ pipe
½″ equals 2
¾″ equals 3.5
5.5 equals 1″ pipe

Dia. Pipe	Capacity Factor
½″	2.
¾″	3.5
1″	5.5
1¼″	10.
1½″	13.5
2″	22.5
2½″	31.5
3″	48.5
3½″	65.
4″	84.
5″	131.5
6″	190.
7″	255.
8″	329.

Standard Dimensions of Wrought-Iron Welded Pipe

Diameter			Nominal Thickness Inches	Circumference		Transverse Areas			Length of Pipe Containing One Cubic Foot	Nominal Weight per Foot Pounds	No. of Threads per inch of Screw
Nominal Internal Inches	Actual External Inches	Approximate Internal Diam. Inches		External Inches	Internal Inches	External Sq. Ins.	Internal Sq. Ins.	Metal Sq. Ins.			
⅛	.405	.269	.068	1.272	.845	.129	.0568	.0720	2533.8	.244	27
¼	.540	.364	.088	1.696	1.144	.229	.1041	.1249	1383.8	.424	18
⅜	.675	.493	.091	2.121	1.549	.358	.1909	.1669	754.36	.567	18
½	.840	.622	.109	2.639	1.954	.554	.3039	.2503	473.91	.850	14
¾	1.050	.824	.113	3.299	2.589	.866	.5333	.3327	270.03	1.130	14
1	1.315	1.049	.133	4.131	3.296	1.358	.8640	.4940	166.62	1.678	11½
1¼	1.660	1.380	.140	5.215	4.335	2.164	1.495	.6685	96.28	2.272	11½
1½	1.900	1.610	.145	5.969	5.058	2.835	2.036	.7995	70.75	2.717	11½
2	2.375	2.067	.154	7.461	6.494	4.430	3.355	1.075	42.91	3.652	11½
2½	2.875	2.469	.203	9.032	7.757	6.492	4.788	1.704	30.08	5.793	8
3	3.500	3.068	.216	10.996	9.638	9.621	7.393	2.228	19.48	7.575	8
3½	4.000	3.548	.226	12.566	11.146	12.566	9.886	2.680	14.57	9.109	8
4	4.500	4.026	.237	14.137	12.648	15.904	12.730	3.174	11.31	10.790	8
4½	5.000	4.506	.247	15.708	14.156	19.635	15.947	3.688	9.03	12.538	8
5	5.563	5.047	.258	17.477	15.856	24.306	20.006	4.300	7.20	14.617	8
6	6.625	6.065	.280	20.813	19.054	34.472	28.891	5.581	4.98	18.974	8
7	7.625	7.023	.301	23.955	22.063	45.664	38.738	6.926	3.72	23.544	8
8	8.625	7.981	.322	27.096	25.073	58.426	50.027	8.399	2.88	28.554	8
9	9.625	8.941	.342	30.238	28.089	72.760	62.786	9.974	2.29	33.907	8
10	10.750	10.020	.365	33.772	31.479	90.763	78.855	11.908	1.83	40.483	8
11	11.750	11.000	.375	36.914	34.558	108.434	95.033	13.401	1.51	45.557	8
12	12.750	12.000	.375	40.055	37.699	127.676	113.097	14.579	1.27	49.562	8

From Standard Authorities

Areas of Circles

Dia.	Area	Dia.	Area	Dia.	Area	Dia.	Area	Dia.	Area
1/8	0.0123	3 1/4	8.295	12 1/2	122.71	22 1/2	397.60	40	1256.6
1/4	0.0491	3 1/2	9.621	13	132.73	23	415.47	41	1320.2
3/8	0.1104	3 3/4	11.044	13 1/2	143.13	23 1/2	433.73	42	1385.4
1/2	0.1963	4	12.566	14	153.93	24	452.39	43	1452.2
5/8	0.3067	4 1/2	15.904	14 1/2	165.13	24 1/2	471.43	44	1520.5
3/4	0.4417	5	19.635	15	176.71	25	490.87	45	1590.4
7/8	0.6013	5 1/2	23.758	15 1/2	188.69	26	530.93	46	1661.9
1	0.7854	6	28.274	16	201.06	27	572.55	47	1734.9
1 1/8	0.9940	6 1/2	33.183	16 1/2	213.82	28	615.75	48	1809.5
1 1/4	1.227	7	38.484	17	226.98	29	660.52	49	1885.7
1 3/8	1.484	7 1/2	44.178	17 1/2	240.52	30	706.86	50	1963.5
1 1/2	1.767	8	50.265	18	254.46	31	754.76	51	2042.8
1 5/8	2.073	8 1/2	56.745	18 1/2	268.80	32	804.24	52	2123.7
1 3/4	2.405	9	63.617	19	283.52	33	855.30	53	2206.1
1 7/8	2.761	9 1/2	70.882	19 1/2	298.64	34	907.92	54	2290.2
2	3.141	10	78.540	20	314.16	35	962.11	55	2375.8
2 1/4	3.976	10 1/2	86.590	20 1/2	330.06	36	1017.8	56	2463.0
2 1/2	4.908	11	95.030	21	346.36	37	1075.2	57	2551.7
2 3/4	5.939	11 1/2	103.86	21 1/2	363.05	38	1134.1	58	2642.0
3	7.068	12	113.09	22	380.13	39	1194.5	59	2733.9

To find the area of a circle when diameter is given, multiply the square of the diameter by .7854.

Decimal Equivalents

Inch Fractions

1/64—.015625	17/64—.265625	33/64—.515625	49/64—.765625
1/32—.03125	9/32—.28125	17/32—.53125	25/32—.78125
3/64—.046875	19/64—.296875	35/64—.546875	51/64—.796875
1/16—.0625	5/16—.3125	9/16—.5625	13/16—.8125
5/64—.078125	21/64—.328125	37/64—.578125	53/64—.828125
3/32—.09375	11/32—.34375	19/32—.59375	27/32—.84375
7/64—.109375	23/64—.359375	39/64—.609375	55/64—.859375
1/8—.125	3/8—.375	5/8—.625	7/8—.875
9/64—.140625	25/64—.390625	41/64—.640625	57/64—.890625
5/32—.15625	13/32—.40625	21/32—.65625	29/32—.90625
11/64—.171875	27/64—.421875	43/64—.671875	59/64—.921875
3/16—.1875	7/16—.4375	11/16—.6875	15/16—.9375
13/64—.203125	29/64—.453125	45/64—.703125	61/64—.953125
7/32—.21875	15/32—.46875	23/32—.71875	31/32—.96875
15/64—.234375	31/64—.484375	47/64—.734375	63/64—.984375
1/4—.25	1/2—.5	3/4—.75	1—1.

Conversion Table

Millimetres ×.03937 = inches.
Millimetres ÷25.4 = inches.
Centimetres ×.3937 = inches.
Centimetres ÷2.54 = inches.
Metres ×39.37 = inches. (Act of Congress.)
Metres ×3.281 = feet.
Metres ×1.094 = yards.
Kilometres ×.621 = miles.
Kilometres ÷1.6093 = miles.
Kilometres ×3280.7 = feet.
Square millimetres ×.00155 = square inches.
Square millimetres ÷645.1 = square inches.
Square centimetres ×.155 = square inches.
Square centimetres ÷6.451 = square inches.
Square metres ×10.764 = square feet.
Square kilometres ÷247.1 = acres.
Hectares ×2.471 = acres.
Cubic centimetres ÷16.383 = cubic inches.
Cubic centimetres ÷3.69 = fluid drachms (U. S. P.).
Cubic centimetres ÷29.57 fluid ounces (U. S. P.).
Cubic metres ×35.315 = cubic feet.
Cubic metres ×1.308 = cubic yards.
Cubic metres ×264.2 = gallons (231 cubic inches).
Litres ×61.022 = cubic inches. (Act of Congress.)
Litres ×33.84 = fluid ounces (U. S. P.).
Litres ×.2642 = gallons (231 cubic inches).
Litres ÷3.78 = gallons (231 cubic inches).
Litres ÷28.316 = cubic feet.

Hectolitres ×3.531 = cubic feet.
Hectolitres ×2.84 = bushels (2150.42 cubic inches).
Hectolitres ×.131 = cubic yards.
Hectolitres ×26.42 gallons (231 cubic inches).
Grammes ×15.432 = grains. (Act of Congress.)
Grammes ×981 = dynes.
Grammes (water) ÷29.57 = fluid ounces.
Grammes ÷28.35 = ounces avoirdupois.
Grammes per cubic centimetres ÷27.7 = pounds per cubic inch.
Joules ×.7373 = foot pounds.
Kilogrammes ×2.2046 = pounds.
Kilogrammes ×35.3 = ounces avoirdupois.
Kilogrammes ÷907.2 = tons (2,000 pounds).
Kilogrammes per square cent. ×14.223 = pounds per square inch.
Kilogrammes per square metre ÷4.89 = pounds per square foot.
Kilogrammetres ×7.233 = foot pounds.
Kilogrammes per metre ×.672 = pounds per foot.
Kilogrammes per cubic metre ×.062 = pounds per cubic foot.
Kilogrammes per cheval ×2.235 = pounds per horse-power.
Kilowatts ×1.34 = horse-power.
Watts ÷746 = horse-power.
Watts ×.7373 = foot pounds per second.
Calories ×3.968 = British thermal units.
Cheval vapeur ×.9863 = horse-power.
Cheval vapeur per square metre of heating surface ÷10.9 = horse-power per square foot of heating surface.
(Centigrade ×1.8) +32 = degrees Fahrenheit.
Gravity Paris = 980.94 centimetres per second.

To Convert From	MULTIPLY BY														
	To Cu. In.	To Cu. Ft.	To Cu. Yd.	To Fl. Oz.	To Pint	To Quart	To Gallon	To Grain	To Oz. Troy	To Oz. Av.	To Lb. Troy	To Lb. Av.	To CC or G	To Ltr or Kg	To Cu. M
Cu. In.	1.00000	.$0_3$5787	.$0_4$2143	.554112	.039632	.017316	.004329	252.891	.526857	.578037	.043905	.036127	16.3871	.016387	.$0_4$1639
Cu. Ft.	1728.00	1.00000	.037037	957.505	59.8992	29.9221	7.48052	436996	910.408	998.898	75.8679	62.4280	28316.9	28.3169	.028317
Cu. Yd.	46656.0	27.0000	1.00000	25852.6	1615.79	807.896	201.974	1179$90_3$	24581.0	26968.9	2048.42	1685.56	764556	764.556	.764556
Fl. Oz.	1.80469	.001044	.$0_3$3868	1.00000	.062500	.031250	.007813	456.390	.950813	1.04318	.079234	.065199	29.5736	.029574	.$0_4$2957
Pint	28.8750	.016710	.$0_2$6189	16.0000	1.00000	.500000	.125000	7302.23	15.2130	16.6908	1.26775	1.04318	473.177	.473177	.$0_3$4732
Quart	57.7500	.033420	.001238	32.0000	2.00000	1.00000	.250000	1460.45	30.4260	33.3816	2.53550	2.08635	946.354	.946354	.$0_3$9464
Gallon	231.000	.133681	.004951	128.000	8.00000	4.00000	1.00000	58417.9	121.704	133.527	10.1420	8.34541	3785.42	3.78542	.003785
Grain	.003959	.$0_5$2288	.$0_7$8975	.002191	.$0_3$1369	.$0_4$6850	.$0_4$1712	1.00000	.002083	.002286	.$0_3$1736	.$0_3$1428	.064799	.$0_4$6480	.$0_7$6480
Oz. Troy	1.89805	.001098	.$0_3$4068	1.05173	.065733	.032867	.008217	480.000	1.00000	1.09714	.083333	.068571	31.1035	.031104	.$0_3$3110
Oz. Av.	1.72999	.001001	.$0_3$3708	.958608	.059913	.029957	.007489	437.500	.911457	1.00000	.075955	.062500	28.3495	.028350	.$0_2$2835
Lb. Troy	22.7766	.013181	.$0_3$4882	12.6208	.788800	.394400	.098600	5760.00	12.0000	13.1657	1.00000	.822857	373.242	.373242	.$0_3$3732
Lb. Av.	27.6799	.016018	.$0_2$5933	15.3378	.958611	.979306	.119826	7000.00	14.5833	16.0000	1.21528	1.00000	453.593	.453593	.$0_2$4536
CC or G	.061029	.$0_3$3531	.$0_5$1308	.033814	.002113	.001057	.$0_2$2642	15.4323	.032151	.035274	.002679	.002205	1.00000	.001000	.000001
Ltr. or Kg.	61.0237	.035315	.001308	33.8140	2.11337	1.05669	.264172	15432.3	32.1507	35.2739	2.67923	2.20462	1000.00	1.00000	.001000
Cu. M	61023.7	35.3146	1.30795	33814.0	2113.37	1056.69	264.172	154320$_3$	32150.7	35273.9	2679.23	2204.62	100000.	1000.00	1.00000

Note: The small subnumeral following a zero indicates that the zero is to be taken that number of times; thus, .$0_3$1428 is equivalent to .0001428.
In this table the relation between volume and weight in lbs. is for H_2O; For other substance multiply by Specific Gravity.

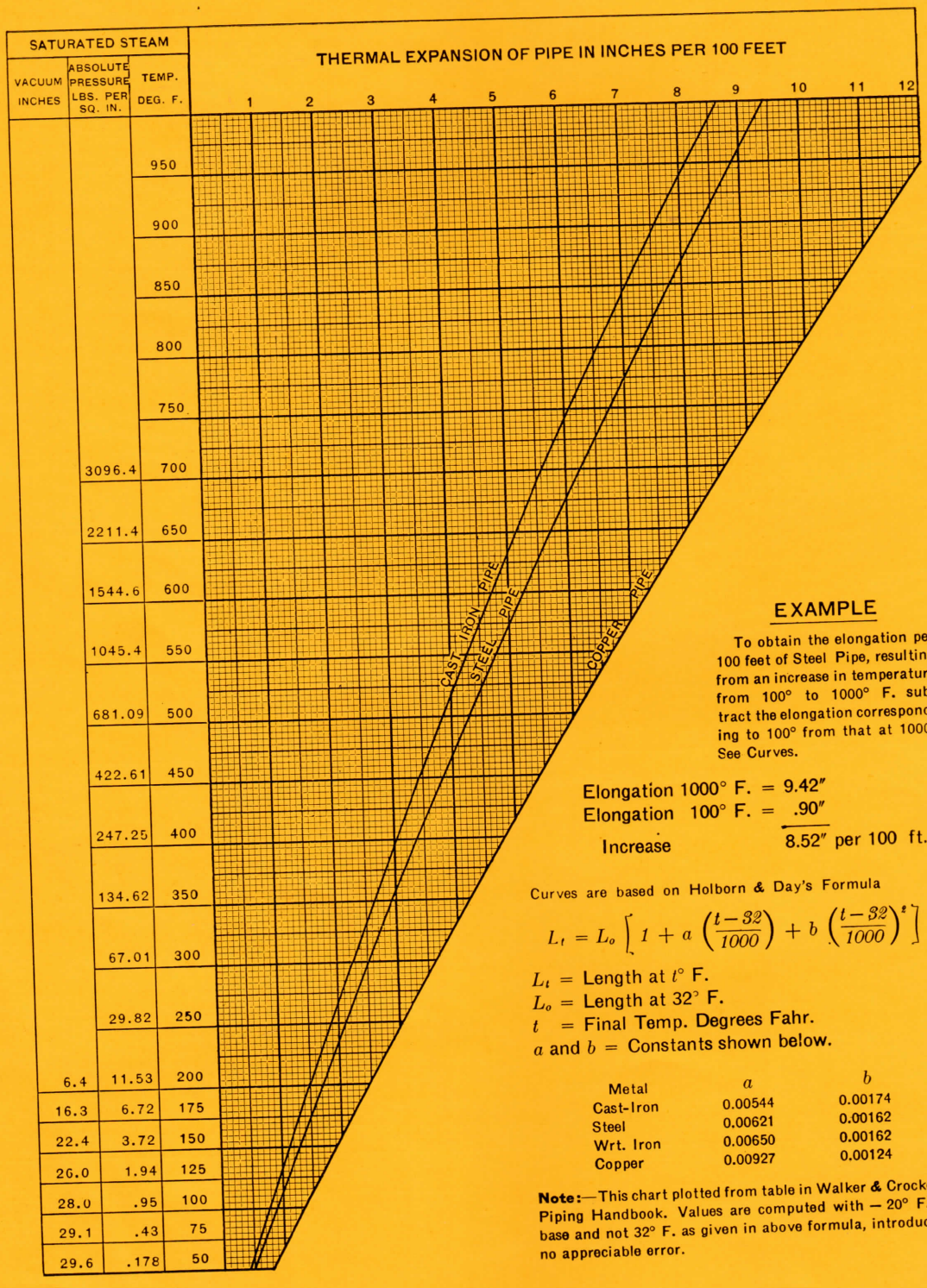
Values used in constructing tables:
1 in. = 2.54001 c. m.
1 cu. in. = 16.387083 c. c.
16.387083 g H O at 40oC = 39°F
1 lb. av. = 453.5926 g
1 gal. = 8.34541 lbs.
1 lb. av. = 27.679886 cu. in. H_2O at 40°C.
1 lb. av. = 7000 grains
1 gal. = 58417.87 grains
231 cu. in. = 3785.4162 g.

Convert From	MULTIPLY BY									
	To B.T.U.	To P. C. U.	To Cal.	To Ft. Lbs.	To Ft. Tons	To Kg. M.	To HP. Hrs.	To K W Hrs.	To Joules	To Lbs. C.	To Lbs. H_2O
B. T. U.	1.00000	.555556	.251996	778.000	.389001	107.563	.$0_3$3929	.$0_3$2931	1055.20	.$0_4$6876	.001031
P. C. U.	1.80000	1.00000	45.3593	1400.40	.700202	193.613	.$0_3$7072	.$0_3$5276	1899.36	.$0_3$1238	.001855
Calories	3.96832	2.20462	1.00000	3091.36	1.54368	426.844	.001559	.001163	4187.37	.$0_2$2729	.004089
Ft. Lbs.	.001285	.$0_3$7141	.$0_3$3239	1.00000	.000500	.138255	.$0_5$5050	.$0_5$3767	1.35625	.$0_7$8840	.$0_5$1325
Ft. Tons	2.57069	1.42816	.647804	2000.00	1.00000	276.511	.001010	.$0_3$7535	2712.59	.$0_3$1768	.002649
Kg. M.	.009297	.005165	.002343	7.23301	.003617	1.00000	.$0_5$3653	.$0_5$2725	9.81009	.$0_4$6394	.$0_5$9580
H.P. Hours	2544.99	1413.88	641.327	1980000	990.004	273747	1.00000	.74600	2685473	.175044	2.62261
K W Hrs.	3411.57	1895.32	859.702	2654200	1327.10	366959	1.34041	1.00000	3599889	.234648	3.51562
Joules	.$0_3$9477	.$0_3$5265	.$0_3$2388	.737311	.$0_3$3687	.101937	.$0_3$3724	.$0_3$2778	1.00000	.$0_7$6518	.$0_5$9766
Lbs. C.	14544.0	8080.00	3665.03	113150$_3$	5657.63	1564396	5.71434	4.26285	153470$_3$	1.00000	14.9876
Lbs. H_2O	970.400	539.111	244.537	754971	377.487	104379	.381270	.284424	1023966	.066744	1.00000

"P. C. U." refers to the "pound-centigrade-unit." The ton used is 2,000 pounds.
"Lbs. C" refers to pounds of carbon oxidized, 100% efficiency equivalent to the corresponding number of heat units.
"Lbs. H O" refers to pounds of water evaporated at 100° C = 212° F at 100% efficiency.

From Standard Authorities

EXPANSION OF PIPE



EXAMPLE

To obtain the elongation per 100 feet of Steel Pipe, resulting from an increase in temperature from 100° to 1000° F. subtract the elongation corresponding to 100° from that at 1000° See Curves.

Elongation 1000° F. = 9.42″
Elongation 100° F. = .90″
Increase 8.52″ per 100 ft.

Curves are based on Holborn & Day's Formula

$$L_t = L_o \left[1 + a \left(\frac{t-32}{1000} \right) + b \left(\frac{t-32}{1000} \right)^2 \right]$$

L_t = Length at $t°$ F.
L_o = Length at 32° F.
t = Final Temp. Degrees Fahr.
a and b = Constants shown below.

Metal	a	b
Cast-Iron	0.00544	0.00174
Steel	0.00621	0.00162
Wrt. Iron	0.00650	0.00162
Copper	0.00927	0.00124

Note:—This chart plotted from table in Walker & Crocker's Piping Handbook. Values are computed with — 20° F. as base and not 32° F. as given in above formula, introducing no appreciable error.

INDEX OF TELEGRAPHIC CODE WORDS IN THIS BOOK

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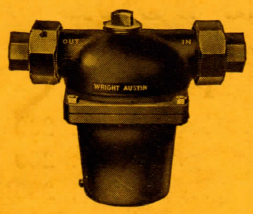
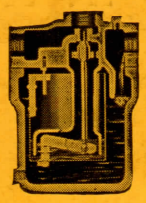
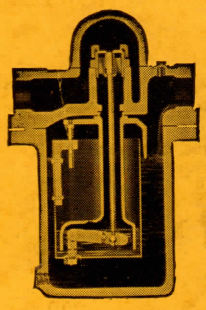


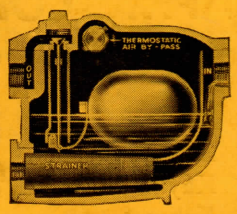
"Baby" Airxpel Bucket Steam Trap



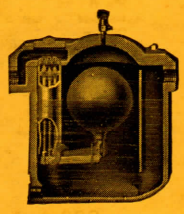
"Cub" Airxpel Bucket Steam Trap



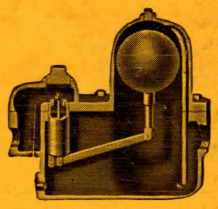
"Master" Airxpel Bucket Steam Trap



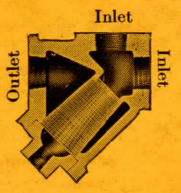
"Combination" Float and Thermostatic Steam Trap



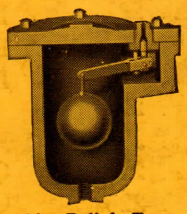
"Emergency" Float type for varying pressures



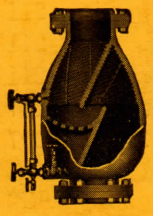
"Victor" Float type for heavy duty Also Oil and Grease Trap



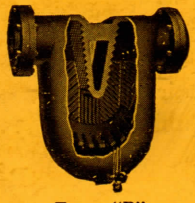
The "Tuway" Strainer—either straightway or angle.



Air Relief Trap

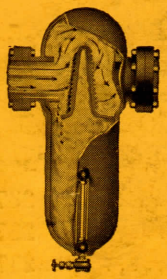


Type "A" Vertical Steam Separator

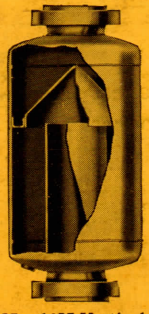


Type "B" Horizontal Steam Separator

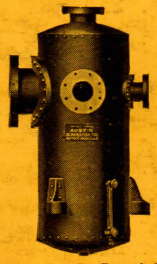
Type "T" Compressed Air purifier



Type "E" Horizontal Steam and Air Separator



No. 10N Vertical Separator 3 to 14 Inches



"Standard Special" Steel Receiver Separator

COMPLETE LINE *of* STEAM POWER SPECIALTIES

Because of the endless variations of actual working conditions, no steam trap is an all-purpose trap, any more than one valve is an all-purpose valve.

By manufacturing several kinds of traps for different conditions, a type and size for the highest efficiency may easily be selected from the large Wright-Austin line.

Likewise, in Steam and Oil Separators, Wright-Austin offers the most complete and largest number of types and sizes made in this Country.

The same applies to Boiler Trimmings and other Steam Power Specialties.

Continuously in close contact with modern plants, our Engineers have been quick to add new improvements, types and sizes wherever needed.

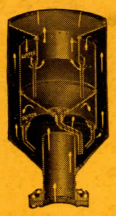
Today, the Wright-Austin Company offers a very complete line of time-tested and thoroughly reliable Power Specialties—all modestly priced. Write for descriptive literature.

WRIGHT AUSTIN

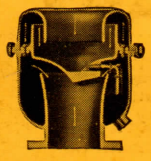
315 W. Woodbridge Street **Detroit, Michigan**

Distributors and Agents in Principal centers

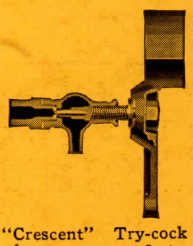
Type "S" Oil Separator Self Cleaning



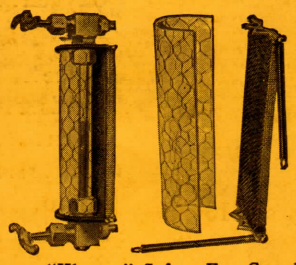
"Cyclone" Galvanized Exhaust Head and Muffler



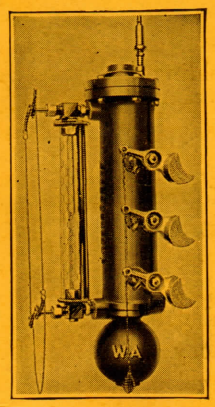
Cast Iron Exhaust Head



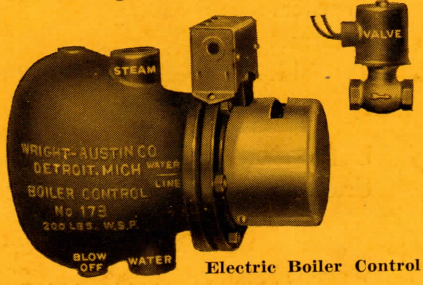
"Crescent" Try-cock for pressures 0 to 700 lbs.



"Kleervu" Safety Eye Guard and Gauge Glass Protector

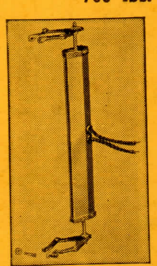


High and Low Alarm Water Column Water Gauge. "Crescent" Try-cocks and "Kleervu" Safety Eye Guard and Gauge Glass Protector.

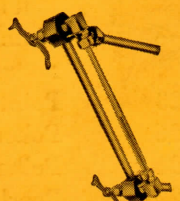


Electric Boiler Control

Controls for Liquid Level and Boiler Feeding—an iron watchman that never sleeps, but automatically maintains a normal liquid level.



A Gauge Light which makes your water level visible at distance of 150 feet.



"Plainsite" Inclined Water Gauge

ESTABLISHED NEARLY FIFTY YEARS AGO

Printed in U. S. A.