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637 MINNA STREET
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PHONE: MARKET 3612

MARINE BULLETIN

Standard with STEAM USERS SINCE '94

WRIGHT-AUSTIN

BULLETIN NO. 40

WRIGHT-AUSTIN COMPANY

Main Office and Shops

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
Controls

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 each to you FOB Detroit, Mich.
Stocker —Can ship at once from stock
Onefold —Can ship within one week
Twofold —Can ship within two weeks
Threefold —Can ship within three weeks
Fourfold —Can ship within four weeks
Fivefold —Can ship within five weeks
Sixfold —Can ship within six weeks
Sevenfold —Can ship within seven weeks
Eightfold —Can ship within eight weeks
Tenfold —Can ship within ten 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

Polar	1 lb.	Poker	125 lbs.
Poise	3 lbs.	Plane	150 lbs.
Polka	5 lbs.	Pivot	175 lbs.
Point	10 lbs.	Prime	200 lbs.
Podge	15 lbs.	Power	225 lbs.
Posey	20 lbs.	Punch	250 lbs.
Poppy	25 lbs.	Plimp	275 lbs.
Posse	30 lbs.	Plots	300 lbs.
Pouch	40 lbs.	Phram	350 lbs.
Poorl	50 lbs.	Phlit	400 lbs.
Porch	75 lbs.	Phads	450 lbs.
Plumb	100 lbs.	Photo	500 lbs.
Pence	110 lbs.	Phirn	600 lbs.
		Potent	650 lbs.

See Index of all Code Words in this book on page 444.

PRINTED IN U. S. A.

INDEX

SEPARATORS FOR MARINE USE

SEPARATORS

FOR ALL TYPES OF SHIPS AND ALL PIPE LINE PURPOSES

Steam Separators

Oil Separators

Inert Gas Separators

Smoke Screen Separators

Compressed Air Purifiers

To separate and remove condensate, moisture, oil, and liquids from pipe lines.

A COMPLETE LINE FOR MARINE SERVICE

All types of Separators described in this bulletin have been proven highly efficient in marine service over a long period of years.

These Separators will successfully separate and collect the liquids, but it is vitally important that these liquids be discharged instantly and automatically and not allowed to accumulate in the Separator.

A positive quick acting, mechanically operated trap is recommended to draw away the liquids as fast as collected in the Separator. Suitable Traps are described on pages 416 to 436. An index is printed on page 415.

All Separators are plainly marked to indicate the direction of flow.

Your inquiries are cordially invited for further information, and on other types of Separators and installations not shown in this bulletin.

When writing for prices and information please give:

1. Pipe size
2. Highest working pressure
3. Whether for Siren or Whistle, Main or Auxiliary steam lines, above or below deck, etc.
4. Kind of Ship

GENERAL RULES AND REGULATIONS OF U. S. BUREAU OF MARINE INSPECTION AND NAVIGATION

Page References below are from the 51st Supplement to General Rules, dated January 1, 1935

STEAM SEPARATORS AND TRAPS

APPROVAL **Rule 2, Section C-16-1, Page 93.**

(a) Evaporators, heaters, **TRAPS**, valves and fittings, **SEPARATORS** and pressure vessels are subject to approval by the board of supervising inspectors before being installed on vessels coming under the jurisdiction of this bureau.

DEFINITION **Rule 2, Section C-16-2, Page 93.**

(d) A **STEAM SEPARATOR**, is a pressure vessel fitted in the steam pipe line and equipped with means for extracting the moisture from the steam.

(e) A **STEAM TRAP** is a pressure vessel designed to trap and discharge water from steam spaces.

MATERIALS **Rule 2, Section C-16-3, Page 93.**

(b) **CAST IRON**, conforming to Rule 1, Section M-18, Page 34.

Allowable for **SEPARATORS** if pressure does not exceed 25 lbs. and if Separators are not subject to "shock."

Allowable for **TRAPS** if pressure does not exceed 125 lbs. (Rule 2, Section P-19-3-L, Page 101).

BRONZE, conforming to Rule 1, Section M-20, Page 38.

Allowable if temperature of steam does not exceed 450°F.

STEEL, conforming to Rule 1, Section M-17, Page 31.

For all other conditions.

STRENGTH **CAST IRON, Rule 1, Section M-18, Page 34.**

"Grade A" for walls less than ½" thickness. Minimum tensile strength 20,000 lbs. per sq. in. "Grade B" for walls ½" to 2" thickness. Minimum tensile strength 25,000 lbs. per sq. in.

BRONZE **Rule 1, Section M-20, Page 38.**

"Grade A" for pressures up to 150 lbs. or total temperatures up to 366°F. Minimum tensile strength 27,000 lbs. per sq. in.

"Grade B" for pressures up to 300 lbs. or total temperatures up to 450°F. Minimum tensile strength 32,000 lbs. per sq. in.

STEEL **Rule 1, Section M-17, Page 33.**

"Grade A" for temperatures up to 500° F. Minimum tensile strength 60,000 lbs. per sq. in.

"Grade B" for temperatures up to 850° F. Minimum tensile strength 70,000 lbs. per sq. in.

HYDROSTATIC TESTS **Rule 1, Section M-17-11, Page 33.**

All body castings for valves, etc., or other **PRESSURE VESSELS** or in pipe lines and to be under working pressures of *100 lbs. per square inch or over*, shall be subjected to a hydrostatic test at the *place of manufacture* equal to 3 times the working pressure until the test pressure reaches 1000 lbs. per sq. in. *Then* in a ratio of working pressure to hydrostatic pressure viz:

Working Pressure	*Test Pressure*
600 lbs.	1500 lbs.
900 lbs.	2000 lbs.
1500 lbs.	3500 lbs.

SCREWED ENDS **Rule 2, Section P-19-3-n,**
FLANGED ENDS **Page 101.**

SEPARATORS—Nominal diameters exceeding 2" used for pressures in excess of 100 lbs. shall have flanged ends.

TRAPS—Nominal diameters exceeding 2" used for pressures in excess of 100 lbs. shall have flanged ends.

REGULATIONS OF OTHER MARINE BOARDS

American Bureau of Shipping United States Maritime Commission

These are identical with those of the Bureau of Marine Inspection and Navigation.

Lloyd's rules are also practically the same for Separators and Traps, except inspection at the manufacturer's plant may or may not be required.

SPECIFICATIONS OF U. S. NAVY BUREAU OF SHIPS

APPROVAL TRAPS—Must be of a type previously tested and approved by the Bureau of Ships, U. S. Navy.

SPECIFICATION To meet all requirements in Specification 45Tlc of August 1, 1938.

Note: Wright-Austin "Airxpel" Traps, Series 50, 60, and 100 are approved by the Bureau of Ships, U. S. Navy, for use on Navy ships for:

Type 1—"Open bucket and intermittent discharge"

Type 2—"Pulsating Continuous Flow"
Type 3—"Continuous Flow"

SIREN AND WHISTLE SEPARATORS

Dry steam is necessary for successful signals; therefore, slugs of water, condensate, and wet steam seriously hinder the operation of steam sirens and whistles. Trouble of this nature is eliminated by the use of a suitable steam Separator.

TYPE "U" VERTICAL UPFLOW STEAM SEPARATOR

This is one of the most extensively used Separators on Merchant Ships for siren and whistle service, because of its uniformly fine and dependable results. It is known by many marine engineers as WRIGHT-AUSTIN Drawing B-3348.

Installation of this Separator should be made in the riser as closely as possible to the siren or whistle.

The Separator should be the same pipe size as the steam line to the siren or whistle.

To continuously relieve the Separator of the collected condensate, it should be drained by a suitable mechanically operated steam trap.

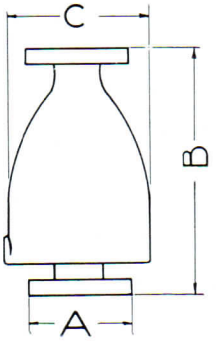
This Separator is made in bronze for 300 lbs. and cast steel for working steam pressures up to 450 lbs.

TYPE "U"

Weights and Dimensions—In Inches

Pipe Size	A	B	C	Drain	Wgt. Lbs.	Code
1¼	5¼	16	9	¾	65	Unbar
1½	6⅛	16⅛	9	¾	65	Unbear
2	6	16⅜	9	¾	65	Unbend

Pressure requirements will govern flange schedule, face-to-face dimensions, and exact weight.



TYPE "UN" VERTICAL UPFLOW STEAM SEPARATOR

For protection against water and wet steam for sirens and whistles on Navy Ships, the "UN" Separator has proven entirely dependable.

It should be the same size as the upflow pipe line, and installed just beneath the siren or whistle.

The Separator should be continuously drained of all water by a dependable, mechanically operated steam trap.

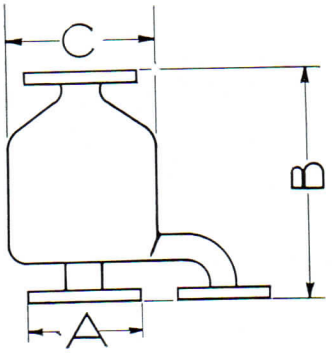
This Separator is made in cast bronze Navy composition G for steam pressures up to 300 lbs.

TYPE "UN"

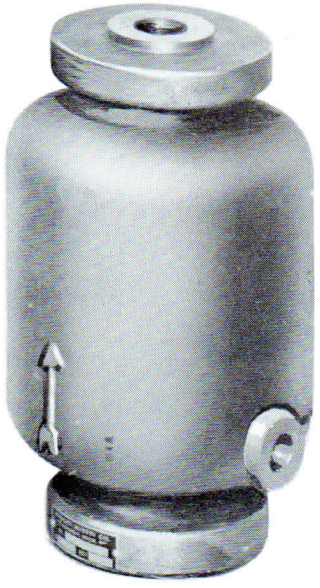
Weights and Dimensions—In Inches

Pipe Size	A	B	C	Drain	Wgt. Lbs.	Code
1	4⅞	10⅞	7	1	67	Unbid
1¼	5¼	11	7	1	75	Unbolt

Pressure requirements will govern flange schedule, face-to-face dimensions, and exact weight.



TYPE "UN2" VERTICAL UPFLOW STEAM SEPARATOR

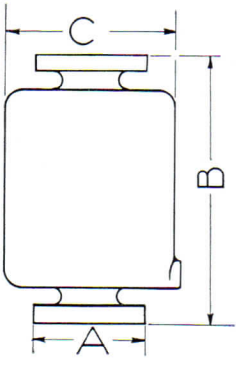


This Separator is used on Navy Ships to deliver dry steam to siren or whistle. It is an upflow type for installation next to the siren or whistle. The pipe size of the Separator should be the same as the steam line.

The Separator must be automatically drained by a good quick acting, mechanically operated steam trap.

This Separator may be provided with flanged drain connection when desired.

Designed for operating steam pressures up to 650 lbs., this Separator is made in cast steel, Navy Class B or C.M.O. Grade.



TYPE "UN2"

Weights and Dimensions—In Inches

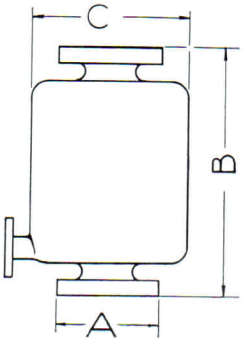
Pipe Size	A	B	C	Drain	Wgt. Lbs.	Code
1	4⅞	10⅞	7¼	1	67	Undine
1¼	5¼	11	7¼	1	75	Unhat

Pressure requirements will govern flange schedule, face-to-face dimensions, and exact weight.

TYPE "DCN" VERTICAL DOWNFLOW STEAM SEPARATOR

This Separator is principally used on Navy Ship auxiliaries. When installed on each unit, it insures dry steam at the throttle. It is compact and symmetrical and blends uniformly with the piping.

Regularly made for working steam pressures up to 650 lbs., in cast steel, Navy Class B or C.M.O.; or for 300 lbs. pressure, in Navy composition G bronze. Sizes 1¼" and 1½" are made with screwed drain connections, and on 2½" and 3" size drain, is flanged.



TYPE "DCN"

Weights and Dimensions—In Inches

Pipe Size	A	B	C	Drain	Wgt. Lbs.	Code
1¼	5¼	12	7¼	¾	47	Unlock
1½	6⅛	12⅛	7¼	¾	47	Unpeg
2½	7	18	10	¾	80	Unrig
3	7½	18	10	¾	80	Unseal

Pressure requirements will govern flange schedule, face-to-face dimensions, and exact weight.

TYPE "TH" HORIZONTAL STEAM SEPARATOR

Intended for Navy Ships below deck on horizontal steam lines to the auxiliaries, or in the combined whistle and siren steam line, to remove the water and condensate and deliver dry steam at the point of service.

Because the body of this Separator is entirely below the pipe line, it is especially suited for cramped spaces, and may be installed right up against the deck ceiling or hull wall, or parallel pipe lines.

For best results, every Separator must be automatically drained of the water collected, by a good mechanical type of steam trap.

The "TH" Separator is designed for working steam pressures up to 650 lbs. in cast steel, Navy Class B or C.M.O. A flanged drain connection is regularly provided on this Separator; also, flanged water gauge connections if desired.

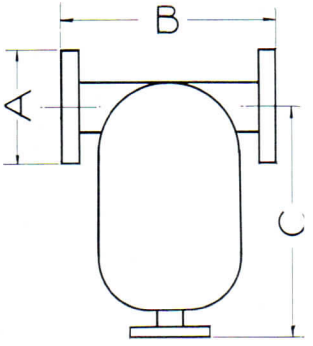
TYPE "TH"

Weights and Dimensions—In Inches

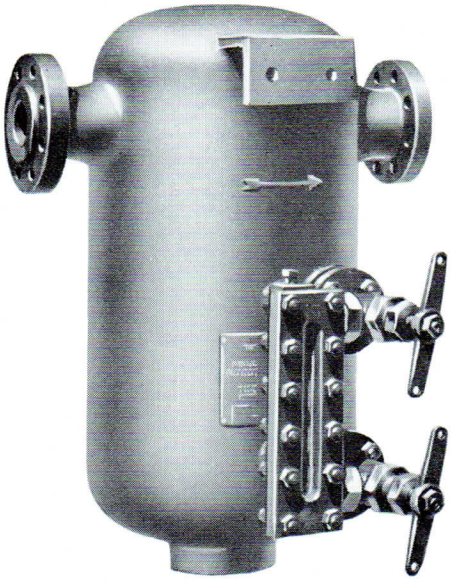
Pipe Size	A	B	C	Drain	Wgt. Lbs.	Code
1½	6⅛	12¾	13⅜	¾	120	Uncage
2	6	12⅛	15 3/16	¾	126	Uncoil
*2½	7	14¼	15⅜	¾	143	Uncurl

*This Separator can be furnished in bronze with 2" pipe connection for 300 lbs. W. S. P.

Pressure requirements will govern flange schedule, face-to-face dimensions, and exact weight.



TYPE "HN" HORIZONTAL RECEIVER TYPE STEAM SEPARATOR



Shows Special Water Gauge which may be furnished on request.

Primarily designed with extra large internal volume or receiver capacity to catch slugs of water or carry over from the boilers and deliver dry steam.

This Separator is used on Navy ships below deck in the horizontal steam lines to the auxiliaries.

Instant and positive drainage of the water collected must be provided by a dependable large capacity bucket steam trap.

Material is cast steel, Navy Class B or C.M.O., for working steam pressures up to 650 lbs.

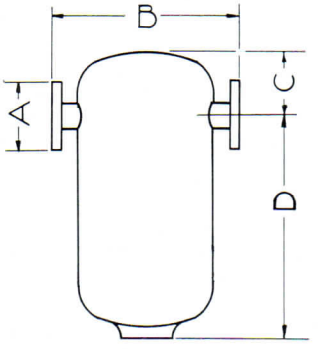
Flanged drain connection is usually provided on this Separator: also, two flanged openings for a water gauge.

TYPE "HN"

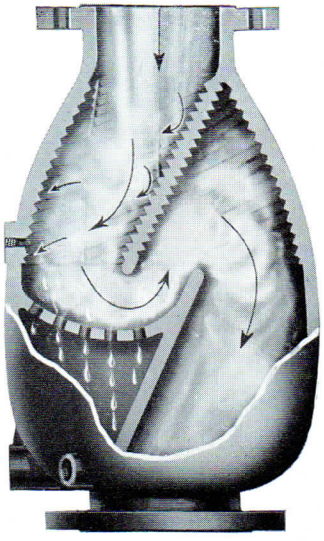
Weights and Dimensions—In Inches

Pipe Size	A	B	C	D	Drain	Wgt. Lbs.	Code
2	6	20½	4	23⅛	2	275	Unhand
2½	7	20½	4	23⅛	2	290	Unhelm
3	7½	23	7	25	2½	340	Unhusk

Pressure requirements will govern flange schedule, face-to-face dimensions, and exact weight.



TYPE "AM" VERTICAL DOWNFLOW STEAM SEPARATOR



Chiefly used on Merchant Ships for protection of main and auxiliary steam equipment where it is desired to place the Separator on the throttle valve of each unit. This is a downflow type and will supply dry steam at the throttle.

A reliable mechanical type steam trap is necessary to drain each Separator.

For Marine service the Type "AM" Separator is designed for working steam pressures up to 25 lbs. in cast iron, and in cast steel for 450 lbs. pressure.

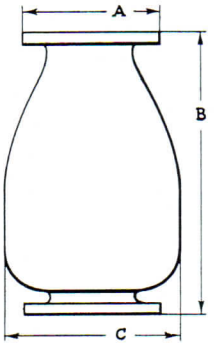
Flanges are sized, faced, and drilled to suit requirements.

TYPE "AM"

List Prices, Weights and Dimensions—In Inches

Pipe Size	A	B	C	Drain	Wgt. Lbs.	List Price	Code Word
*1½	S. E.	11	7	½	40	$27.50	Abate
*2	S. E.	11	7	½	40	32.50	About
2½	7½	13	8	¾	60	44.00	Above
3	8¼	15¼	9	¾	85	48.00	Actor
3½	9	16¾	10	¾	110	54.00	Alert
4	10	18	11	¾	190	65.00	Adrip
5	11	22¼	13	1	210	92.00	Adult
6	12½	25¼	15	1	300	120.00	Acute

*Available with flanged ends, List 1½"—$32.00; 2"—$37.00.



TYPE "BM" HORIZONTAL STEAM SEPARATOR

Where space is limited, this Separator has special advantages, because the body does not extend beyond the outside diameter of the connecting flanges in any direction except directly beneath. This makes it especially adapted for low head room, or where the pipe line is carried right up against a wall or close to other parallel pipes.

The "BM" Separator is for Merchant Ship service and will deliver dry steam for any purpose.

Up to 25 lbs. working steam pressure, it is made in cast iron; and in cast steel for working steam pressures up to 450 lbs.

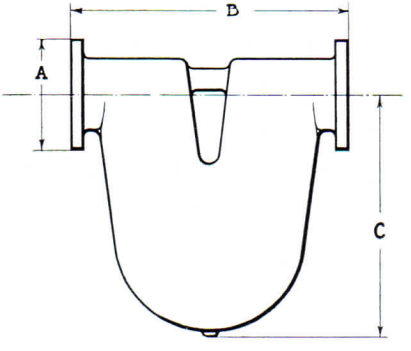
Flanges are faced, drilled, and dimensioned to suit specifications.

TYPE "BM"

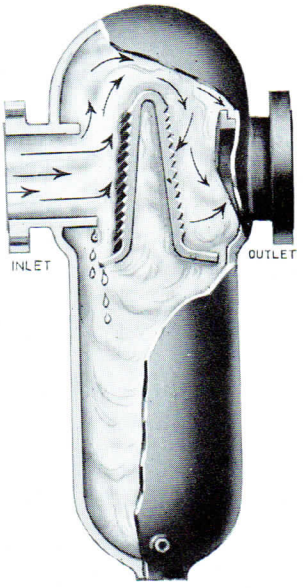
List Prices, Weights and Dimensions—In Inches

Pipe Size	A	B	C	Drain	Wgt. Lbs.	List Price	Code Word
*1½	S. E.	9¼	9	½	45	$23.00	Bacca
*2	S. E.	9¼	9	½	45	26.00	Bravo
2½	7½	13¼	12	¾	80	34.00	Baker
3	8¼	15¼	13	¾	110	41.00	Bandy
3½	9	16	14	¾	130	51.00	Barge
4	10	18¼	15	¾	165	63.00	Brier
5	11	20¾	20¾	1	270	81.00	Batch
6	12½	24¼	22	1	400	122.00	Basis

*Available with flanged ends, List 1½"—$27.00; 2"—$30.00.



TYPE "EM" HORIZONTAL RECEIVER STEAM SEPARATOR



A very efficient Separator with considerable internal cubic volume and receiver capacity in the larger sizes for boiler carry-over or slugs of water. This Separator will deliver dry steam to all below deck equipment on Merchant Ships.

Made in cast iron for working pressures up to 25 lbs., and in cast steel for pressures up to 450 lbs. Prices of cast steel upon request.

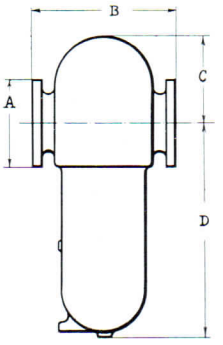
Flanges are faced, drilled, and sized to suit requirements.

TYPE "EM"

List Prices, Weights, and Dimensions—in Inches

Dimensions in Inches						Wgt. Lbs.	List Price	Code Word
Pipe Size	A	B	C	D	Drain			
*1½	S. E.	9¼	5	10	½	60	$26.00	Equip
*2	S. E.	9¼	5	10	½	60	28.00	Eagle
2½	7½	11	6	12	¾	105	36.00	Eblis
3	8¼	12¼	6½	13	¾	145	43.00	Eclat
3½	9	13⅜	7½	15	¾	170	54.00	Edict
4	10	14¾	9	17	¾	200	66.00	Eider
5	11	19¼	11	23	1	380	108.00	Eland
6	12½	21¼	12	26	1	510	132.00	Elate
8	15	24	16	32	1¼	840	224.00	Enjoy

*Avaiable with flanged ends, List 1½"—$30.00; 2"—$32.00.



COMPRESSED AIR PURIFIER

TYPE "TM" WHIRLWIND PATTERN

This Purifier has proven very satisfactory in removing moisture and oil from compressed air up to 600 lbs. working pressure.

Highest efficiency will be obtained by installing the Purifier as closely as possible to the point of use for the compressed air, because the cooler the air, the better the results.

There is no perceptible pressure loss through this Purifier—no small ports or screens to clog—no moving parts to wear or get out of order.

Because of the small amount of condensate in compressed air, it is customary to place a drip leg below the Purifier with a good valve for hand operation.

It is made in cast iron for pressures up to 25 lbs., and in bronze and steel for working pressures up to 600 lbs.

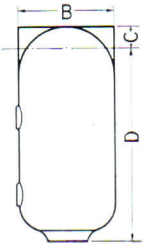
TYPE "TM"

List Prices, Weights and Dimensions—in Inches

Pipe Sizes	B	C	D	Drain	Wgt. Lbs.	List Price	Code Word
½ ¾ 1*	4	⅞	8⅛	1	10	$12.00	½ Piraf ¾ Pifra 1 Pfair
1½ 2*	6¾	1⅜	10⅝	1¼	30	$20.00	1½ Prafi 2 Pairf

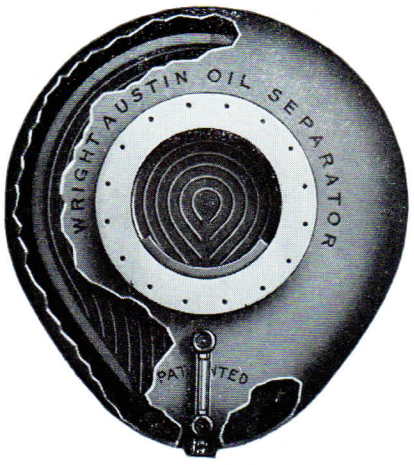
*Regularly tapped this size and bushed to smaller connection.

Prices of bronze and steel Purifiers on request.

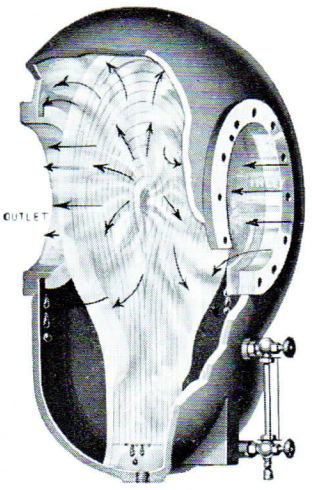


OIL SEPARATORS FOR PURIFYING EXHAUST STEAM

TYPE "SM"



For Pressures from
0 to 25 Lbs.



TYPE "SM" HORIZONTAL SELF-CLEANING OIL SEPARATOR

Provides clean steam and purified condensate by removal of oil from exhaust steam.

Oil-free exhaust steam contains nearly 90% of its original heat, and is then perfectly adapted for heating purposes. Elimination of the oil prevents accumulation of the oily film on the inside of the heating surfaces, and the resulting loss or low degree of heat transfer.

Furthermore, the purified condensate is clean, distilled, and deareated water and excellent for boiler feed.

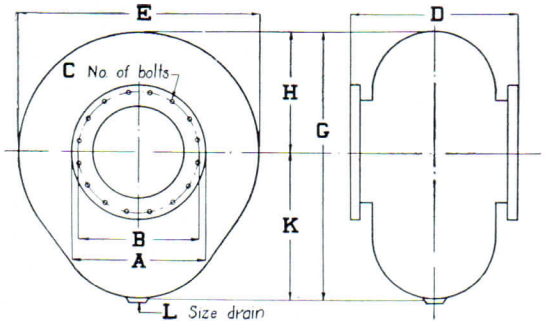
The Type "SM" Oil Separator is positively self-cleaning and requires no cleaning and no maintenance of any kind. Having the large internal area, it will not produce back pressure.

Best results will be obtained by having the Oil Separator placed as far as possible from the engine and auxiliaries, with a straight run of pipe ahead of the inlet to Separator. It is desirable to avoid having a tee or elbow close to the Separator inlet.

Every Separator must be automatically drained by a type of grease trap especially suited to successfully drain away the oil and condensate. See page 435.

The Type "SM" Oil Separator is ordinarily made in cast iron for working pressures up to 25 lbs., and having flanges finished to the A.S.M.E. flange schedule for 125 lbs.

On the larger sizes, the Type "SM" Separators are usually furnished in welded steel construction to suit conditions.



TYPE "SM"

List Prices, Weights, and Dimensions—in Inches

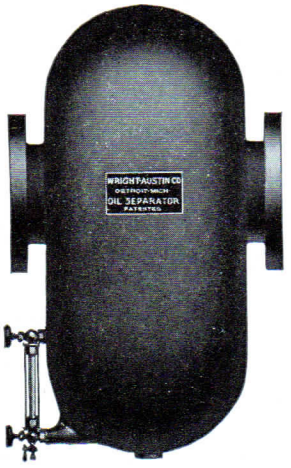
Pipe Size	Dimensions in Inches A	B	C	D	E	G	H	K	L	Wgt. Lbs.	List Price	Code Word
1½	Scrd.	....	.....	10	12	15½	6⅛	9⅜	¾	65	$24.00	Saxon
2	Scrd.	....	.....	10	12	15½	6⅛	9⅜	¾	70	27.00	Saury
2½	7	5½	4– ⅝	10¼	14½	17⅞	7 7/16	10 7/16	1	100	42.00	Skiny
3	7½	6	4– ⅝	10½	15	18	7½	10½	1	120	48.00	Satin
3½	8½	7	4– ⅝	11 -	17	20	8½	11½	1	175	54.00	Sandy
4	9	7½	8– ⅝	12⅜	19	23	9½	13½	1	200	72.00	Saint
5	10	8½	8– ¾	15½	23	27	11½	15½	1¼	315	100.00	Scene
6	11	9½	8– ¾	17½	25	30	12½	17½	1½	4?0	122.00	Scope
8	13½	11¾	8– ¾	18½	29	36	14½	21½	1½	620	170.00	Stick

Water Gauges are supplied on all sizes except 1½" and 2".
Type "SM" Oil Separator is also made in larger sizes.
When cramped for room or where close fits are necessary, please write our Engineering Department for information.

INERT GAS SEPARATORS

FOR FIRE EXTINGUISHING SYSTEMS

TYPE "SM" SEPARATOR



For Working Pressures
Up to 25 Lbs.

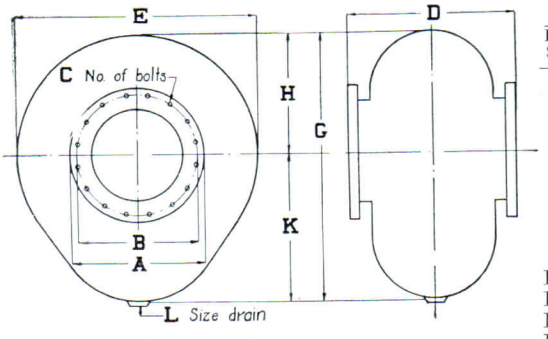
For the delivery of dry gas, the Type "SM" Separator is very efficient in removing the moisture and water.

An oversize drain is provided on this Separator, and in the larger sizes the drain may be provided with a flanged connection.

This Separator is made in cast iron with flanges faced and drilled to 125 lb. flange schedule.

TYPE "SM"

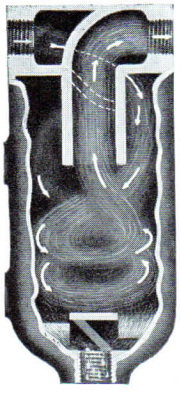
List Prices, Weights and Dimensions—in Inches



Pipe Size	Dimensions in Inches A	B	C	D	E	G	H	K	L	Wgt. Lbs.	List Price	Code Word
1½	Scrd.	....	.....	10	12	15½	6⅛	9⅜	¾	65	$24.00	Saxon
2	Scrd.	....	.....	10	12	15½	6⅛	9⅜	¾	70	27.00	Saury
2½	7	5½	4- ⅝	10¼	14½	17⅞	7 7/16	10 7/16	1	100	42.00	Skiny
3	7½	6	4- ⅝	10½	15	18	7½	10½	1	120	48.00	Satin
3½	8½	7	8- ⅝	11	17	20	8½	11½	1	175	54.00	Sandy
4	9	7½	8- ⅝	12⅜	19	23	9½	13½	1	200	72.00	Saint
5	10	8½	8- ¾	15½	23	27	11½	15½	1¼	315	100.00	Scene
6	11	9½	8- ¾	17½	25	30	12½	17½	1½	400	122.00	Scope
8	13½	11¾	8- ¾	18½	29	36	14½	21½	1½	620	170.00	Stick
10	16	14¼	12- ⅞	19	32	40	16½	23½	1½	800	228.00	Scull
12	19	17	12- ⅞	20	34	42	17½	24½	1½	900	300.00	Sight
14	21	18¾	12-1	20⅜	36	43	18½	24½	1½	1000	348.00	Seize
16	23½	21¼	16-1	22	40	44	20½	23½	1½	1280	400.00	Sense

SMOKE SCREEN SEPARATORS

TYPE "TM" PURIFIER



Because of the similarity of conditions in removing moisture from gases and vapors and from compressed air, the Type "TM" Purifier is also recommended for smoke screen service on Navy Ships.

Drainage should be made by hand-operated valves frequently enough to keep the Purifier clear.

It is supplied in cast iron for working pressures up to 25 lbs., and in bronze for pressures up to 300 lbs.

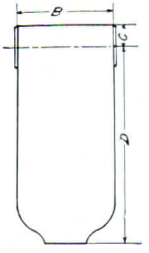
TYPE "TM"

List Prices, Weights and Dimensions—In Inches

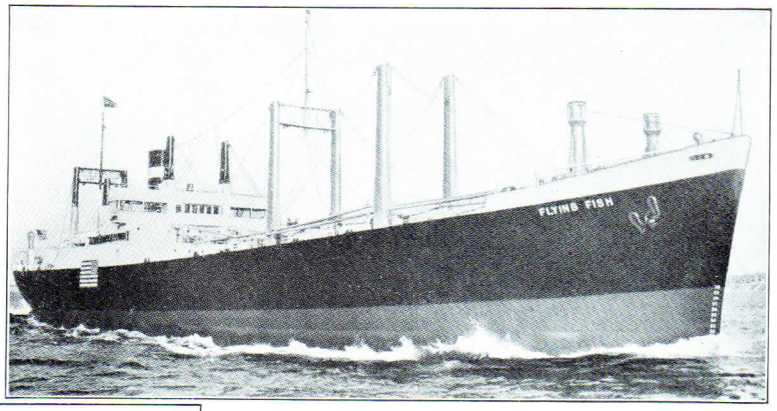
Pipe Sizes	B	C	D	Drain	Wgt. Lbs.	List Price	Code Word
¾	4	⅞	8⅛	1	10	$12.00	¾ Pifra
1*							1 Pfair
1½	6¾	1⅜	10⅝	1¼	30	$20.00	1½ Prafi
2*							2 Pairf

*Regularly tapped this size and bushed to smaller connection.

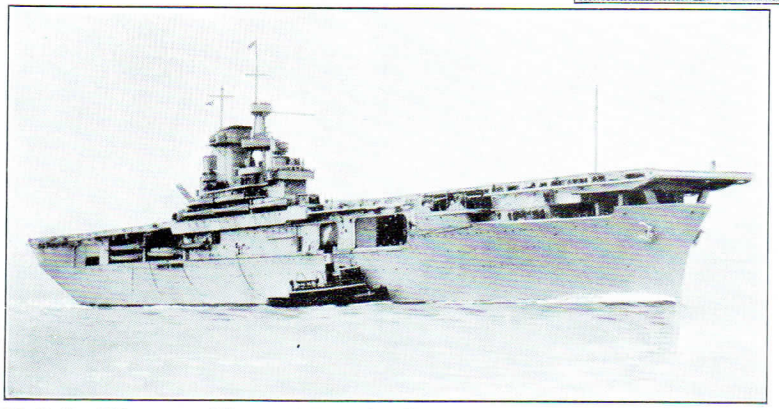
Prices of bronze Separators upon request.



OVER 1000 SHIPS USE WRIGHT-AUSTIN EQUIPMENT



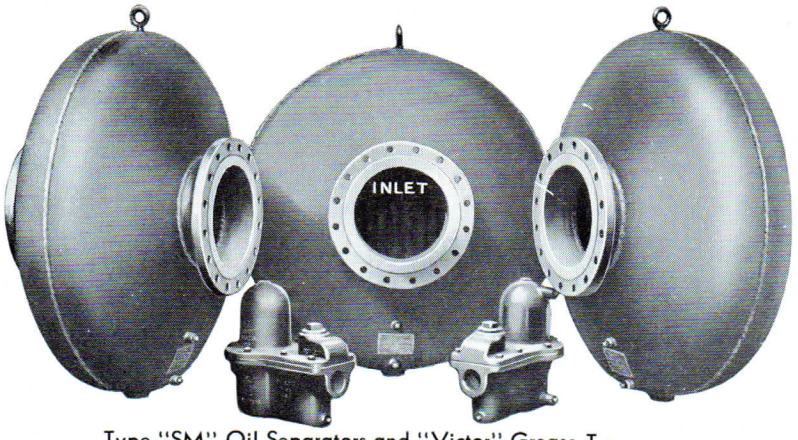
S.S. Flying Fish. One of the many ships of Maritime Commission's design furnished with Wright-Austin Separators. Built by Federal Shipbuilding & Drydock Co.



U.S.S. Wasp. Navy Aircraft Carrier operates with 600 lbs. working steam pressure and uses Wright-Austin Steam Separators.

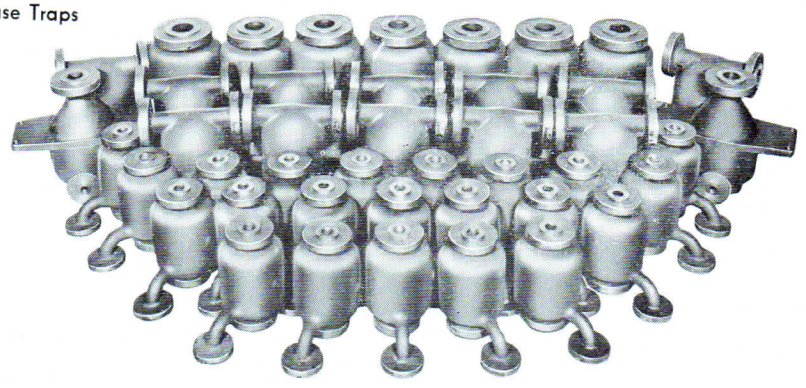
Wright-Austin Separators are approved by all Steamship and Marine bodies having jurisdiction, including the Maritime Commission, Navy Department Bureau of Ships, American Bureau of Shipping, U. S. Bureau of Marine Inspection and Navigation and Lloyd's for operating steam pressures up to 650 lbs.

There are no Separator requirements more rigid or exacting than marine service and especially on Navy Warships. Nothing short of the very peak in efficiency and accomplishment is considered. It is significant that Naval Engineers and Architects should specify and select Wright-Austin Separators for use on the majority of both Navy and Merchant Ships.



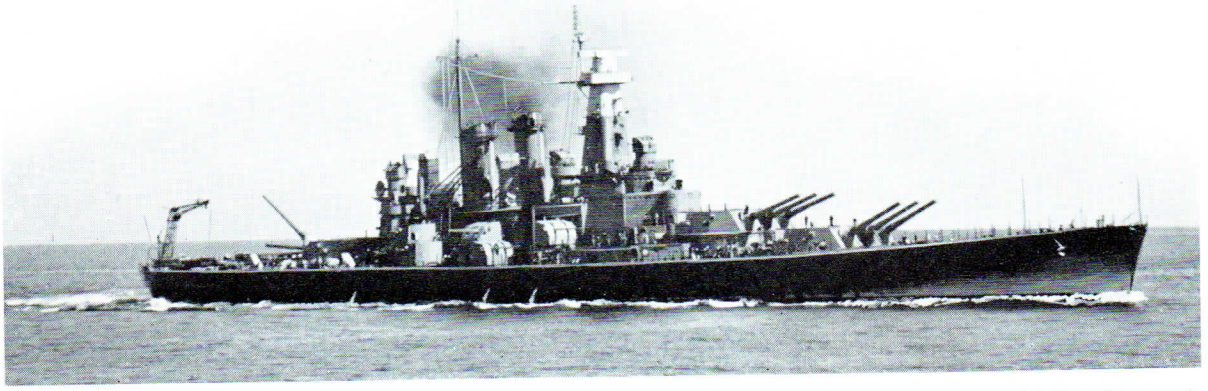
Type "SM" Oil Separators and "Victor" Grease Traps

On the right is illustrated a group of Steam Separators for 650 lbs. working pressure installed on the Navy's latest warships.



WRIGHT AUSTIN

OVER 1000 SHIPS USE WRIGHT-AUSTIN EQUIPMENT

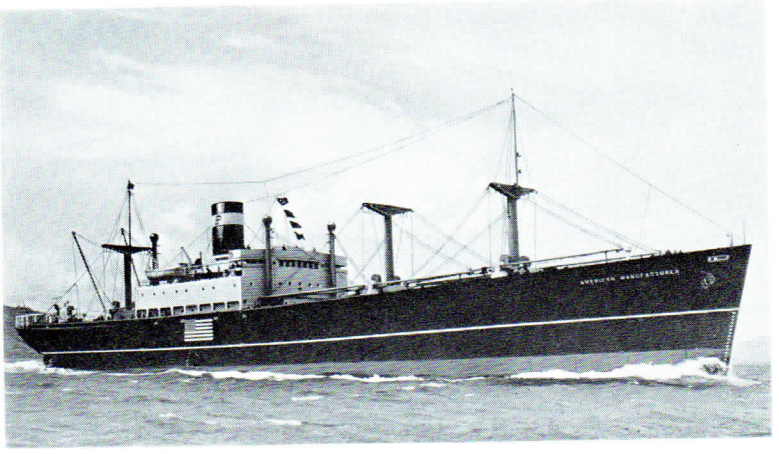


U.S.S. "North Carolina"

Official Navy Photograph

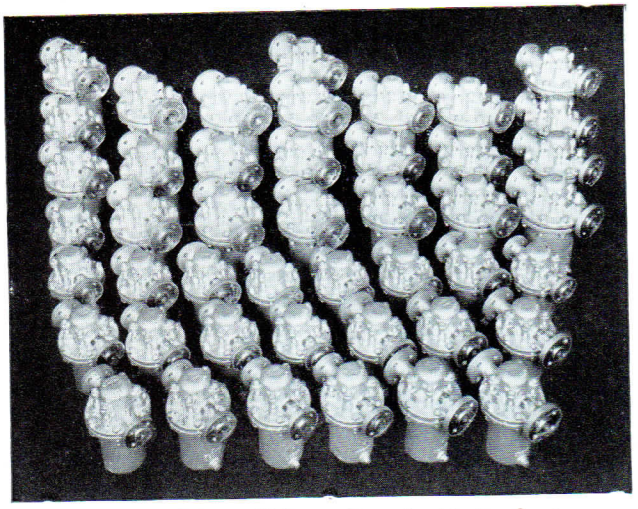
Approved by All

Wright-Austin Traps are on the approved list of all Steamship and Marine Bodies having jurisdiction, including Maritime Commission, American Bureau of Shipping, U. S. Bureau of Marine Inspection and Navigation, as well as Lloyds.

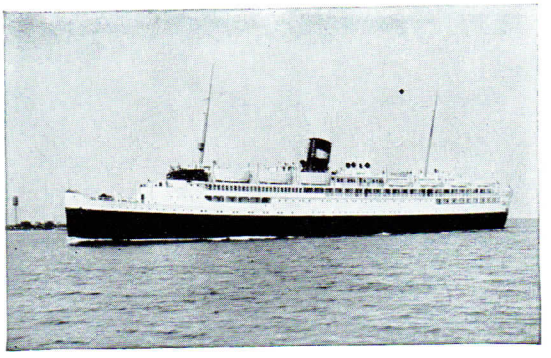


S.S. "American Manufacturer"

Built by Western Pipe & Steel Co., San Francisco, California



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



S.S. "Acadia"

Built by Newport News Shipbuilding and Dry Dock Co., Newport News, Virginia

WRIGHT AUSTIN

INDEX

TRAPS FOR MARINE USE

RECOMMENDATIONS FOR TRAP SIZES FOR SHIPS

For "Airxpel" Open Bucket Traps

Intermittent Discharge

The Trap capacity tables referred to below are:

Cub Traps	Page 408
Master Traps	Page 420
Steel Traps	Page 422

1. Compute the maximum load each Trap is to handle in pounds of condensation per hour. The water rate of the various auxiliaries you know. The amount of condensate per foot of pipe, or coils, or radiation, you secure from the tables in this catalogue. Refer to page 443.

2. Determine the *minimum* pressure differential, that is the difference between the inlet pressure and outlet pressure on the Trap.

3. In the Trap Capacity Tables, under the heading "Gage Pressure Pounds per Square Inch (Differential)", locate your minimum differential pressure and read *down* until you reach a figure equal to the maximum load you have determined according to paragraph 1.

4. If the differential pressure will be *constant* on this Trap, then read horizontally to the left for the proper size "valve seat orifice" to handle your maximum load. Remember the table shows intermittent discharge amounts of condensate for regular service. In overload conditions each Trap will discharge *DOUBLE* this amount of water in continuous flow or *faster* "pumping operations." This is equivalent to 100% overload.

5. The size number of the Trap will be located by keeping within the area for each size of Trap between the heavy black horizontal lines, and moving towards the left where the *Trap Number* is given.

6. If the differential pressure will *not* be constant, and on ships it does vary, then you must determine what the increased differential pressure will be for the worst possible condition. For certain Traps this variable differential pressure may be nearly as much as the boiler pressure, or the difference between the boiler pressure and atmosphere at the hot well. This means that you must now find the proper size of Trap, which is suitable for these maximum differential pressure conditions. Or, in other words, a size of Trap, which will operate under the maximum differential pressure, when using the valve seat orifice above selected for the minimum differential pressure, and maximum capacity the Trap will be required to handle.

7. Starting at the valve seat orifice determined for the minimum differential pressure, you will now follow to the right horizontally until you reach that vertical column, which is headed by the maximum or abnormal differential pressure.

8. This point, or intersection, will be in between two heavy black zigzag lines. Keeping in the area between these same zigzag lines, and moving to the left, you will find the size number of the Trap which will be required for the maximum differential pressure.

9. In other words, this will be a size of Trap, which will be suitable for the full load at the lowest differential pressure, and at the same time, correctly sized for the maximum differential pressure.

10. This is most important, because Bucket Traps operate for each given valve seat orifice only through limited pressure zones. The heavy black *vertical* lines show the highest pressure possible to obtain in each zone for each size of orifice. Beyond this pressure, the Trap will "lock" closed, if the pressure differential exceeds it.

11. If in the 50 Series (CUB) capacity table (page 419), you cannot find a capacity figure large enough for your requirements, then refer to the 60 Series (MASTER) capacity table, (page 421). For Steel Traps, use the 100 Series Table (page 423).

For Ball Float Traps

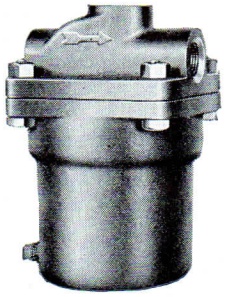
To determine correct size of Float or Continuous Discharge Traps, such as 20 or 40 series, you proceed as in paragraphs 1, 2 and 3, using the capacity tables under these series. The capacities shown are *maximum* with no safety factor. If the differential pressure increases, the capacity will be increased because ball float Traps will operate through a wide pressure zone range without changing orifice sizes, viz:

30 series	0—200 lbs.
40 series	0—20 lbs.
20 series	0—40 lbs.
23 AC	0—125 lbs.

We have over 500 large ships of the Navy and U. S. Merchant Marine equipped with Wright-Austin Traps selected in accordance with the above directions and they *work* successfully in storms as well as calms.

WRIGHT-AUSTIN "AIRXPEL" VERTICAL BUCKET STEAM TRAPS

(Patented)



"Cub" Type, 50 Series
Page 418

"Master" Type, 60 Series
Page 420

"Steel" Type, 100 Series
Page 422

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

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

5. "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.

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

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

8. 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.

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

10. 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

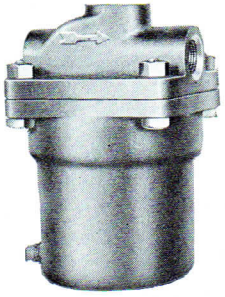
"Airxpel" Steam Traps are self-cleaning to the extent that they will easily discharge particles of foreign matter which are not too large to pass through the valve opening.

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.

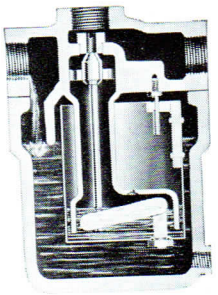
"AIRXPEL" VERTICAL BUCKET STEAM TRAPS

"CUB TYPE"

Sizes No. 051-50-51 and 52 for Pressures up to 125 lbs.



Horizontal—Straight-way inlet and outlet pipe connections.



The "Cub" Traps are the medium and small sizes of the regular "Airxpel" design.

For the many applications where an 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.

Valve Seats Interchangeable

The valve 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.

Material

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

Angle Outlet if Desired

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.

Simplicity

The inside view of the "Cub" Trap 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.

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.

Condensed Capacity Table

Capacities given below are based on intermittent discharge of the Trap. They are recommended as the maximum loads for normal operation, to give the best Trap efficiency and long life.

The "Airxpel" Traps will handle 200% of the following capacities when operating on a continuous discharge basis.

"CUB" TYPE

List Prices, Weights, Capacities, Dimensions—In Inches

Size Number of Trap		051	50	51	52
Pipe Size, Inlet and Outlet		*½ or ¾	*½ or ¾	*¾ or 1	1
List Price cast iron†		$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	610	1760	2390	4320
	10	860	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
	300	....	....	....	....
Diameter		3¼	4¾	4¾	6¾
Height		5½	7⅜	7¾	8¾
Inlet to Outlet, Overall		*6½-4¾	*7¾-6	*8-6	6¾
Center Inlet and Outlet to Bottom		4⅜	6	6⅛	7¾
Blow-off connection		⅛	¼	¼	½

*Pipe sizes and dimensions marked with asterisk are shipped unless the other pipe size is ordered.

† Price of bronze traps on request.

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 the above ratings for continuous discharge capacities.

CUB TYPE "AIRXPEL" STEAM TRAPS

Trap Capacities and Sizes of Valve Seats

Valve Seat Orifice Dia. Inches		GAUGE PRESSURE POUNDS PER SQ. INCH (DIFFERENTIAL)																								Size No. of Trap
		1	3	5	10	15	20	30	40	50	60	70	80	90	100	110	120	130	150	160	170	180	200	225	250	
		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				
Size No. of Trap	5/32	200	345	445	605	735	855	1030	1165	1280	1390	1470	1550	1630	1710	1775	1840	1900	2020	2080						
051	3/16	280	480	610	860	1030	1190	1440	1630	1750	1875	2000	2120	2240	2360	2450										
	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															
	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.

IMPORTANT

For Determining Trap Sizes on Ships, Please Refer to Page 416

"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.

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. Reading horizontally to the left we find 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".

3. 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.

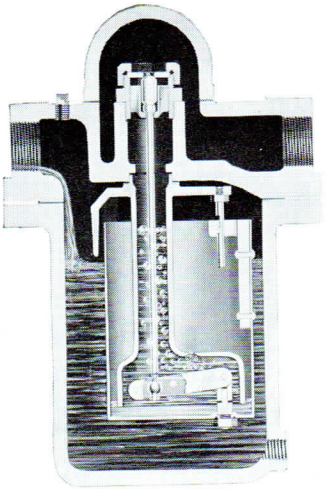
Locate the low pressure figure at the top of the table, and follow down to the heavy zigzag line for the size of the Trap being changed, and then left on the horizontal line to the size of the orifice, suitable for the lower pressure.

For Determining Trap Sizes on Ships, Please Refer to Page 416

"AIRXPEL" VERTICAL BUCKET STEAM TRAPS

"MASTER" TYPE

Sizes: Nos. 61, 63, 65 Semi-steel Traps for pressures up to 125 lbs.



Master "Airxpel" Steam Traps "60 Series"

The "Master" group comprises the high capacity Traps, and is preferred by many Engineers, where dependability for heavy duty is required.

Construction

The body and cover are cast semi-steel for pressures up to 125 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.

"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.

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.

Simplicity

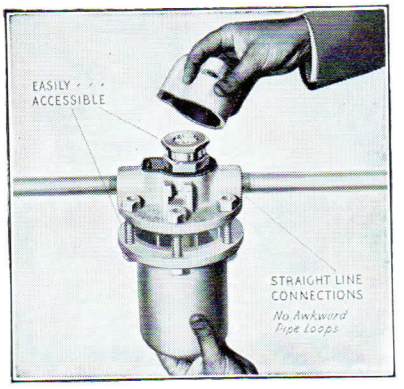
The valve stem, lever and bucket connection with bucket comprise the entire inside working parts. They are simplicity itself, and provide a valve leverage which results in large Trap capacity.

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

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.

Condensed Capacity Table

Capacities given below are based on intermittent discharge of the Trap. They are recommended as the maximum loads for normal operation, to give the best Trap efficiency and long life.

The "Airxpel" Traps will handle 200% of the following capacities when operating on a continuous discharge basis.

"MASTER" TYPE

List Prices, Weights, Capacities, Dimensions—In Inches

Size Number of Trap		61	63	65
Pipe Size, Inlet and Outlet		½ or ¾*	1 or 1¼*	1½ or 2*
List Price semi steel		$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
	Pressures of 10	7600	13530	31300
	Pressures of 20	6710	10550	25580
	Pressures of 60	3440	5670	21450
	Pressures of 110	2450	5600	13670
	Pressures of 130	1900	4750	10550
	Pressures of 150	2020	3870	11200
	Pressures of 170	2130	2990	8560
	Pressures of 200	1820	3170	9250
	Pressures of 250	1550	2510	8000
	Pressures of 300	925	2660	6870
Diameter		6¾	8	10
Inlet to Outlet, Overall		6⅜	8	9¾
Height		12½	15¼	19
Center Inlet and Outlet to Bottom		8⅞	11¼	13⅜

*Pipe sizes and dimensions marked with asterisk are shipped unless the other pipe size is ordered. Blow-off ½" on all sizes.

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 the above ratings for continuous discharge capacities.

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	
		Pounds of Water Discharged per Hour at Above Pressures																						Size No. of Trap
	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.

IMPORTANT

For Determining Trap Sizes on Ships, Please Refer to Page 416

"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.

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. Reading horizontally to the left we find 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".

3. 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.

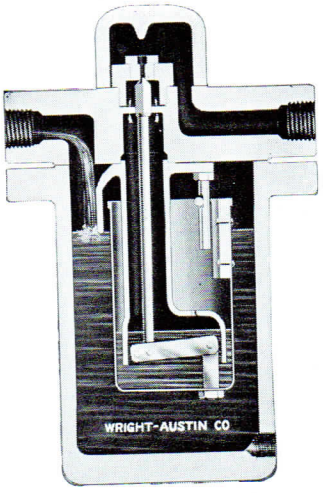
For Determining Trap Sizes on Ships, Please Refer to Page 416

HIGH PRESSURE "AIRXPEL" BUCKET STEAM TRAPS

"STEEL" TYPE

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

Flanged Connections



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.

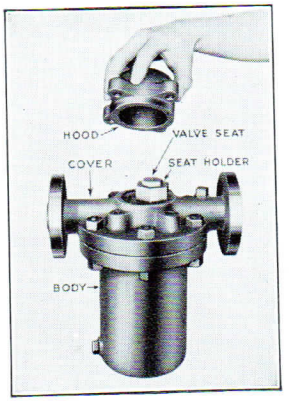
With large capacity, especially for their size and weight, and having horizontal, straightline pipe connections, they make a simple and economical piping installation.

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.



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

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.

Simplicity of Trap

The sectional view of the inside of the Steel "Airxpel" Trap 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.

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.

Condensed Capacity Table

Capacities given below are based on intermittent discharge of the Trap. They are recommended as the maximum loads for normal operation, to give the best Trap efficiency and long life.

The "Airxpel" Traps will handle 200% of the following capacities when operating on a continuous discharge basis.

"Steel" Type List Prices, Weights, Capacities, Dimensions—In In:

Size Number of Trap		101	103	105
Code Word		Hydrogen*	Nitrogen*	Oxygen*
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 Connections F & D		90.00	125.00	180.00
Weight in Pounds—				
Screwed Connections		35	68	106
Flanged Connections F & D		45	86	125
Pounds of water discharged per hour at differential gauge Pressures of	200	1610	2445	5385
	300	1350	2995	6595
	400	1555	2590	5630
	450	1125	2415	5550
	500	850	1745	4275
	600	930	1910	4680
	700	995	1515	3820
Overall — Inlet to Outlet Screwed Connections		7	9⅜	10¾
Face to Face—Inlet to Outlet Flanged Connections		10¼*‡	13⅜*‡	15⅝*‡
Diameter		7	9⅜	10¾
Height		12¾	15½	17¾
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 the above ratings for continuous discharge capacities.

HIGH PRESSURE "AIRXPEL" VERTICAL BUCKET STEAM TRAPS

"STEEL" TYPE

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.

IMPORTANT

For Determining Trap Sizes on Ships, Please Refer to Page 416

"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.

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. Reading horizontally to the left we find 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.

3. 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.

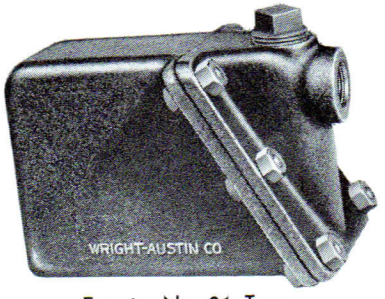
Or, if it is desired to change a trap from a high to a lower pressure.

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.

For Determining Trap Sizes on Ships, Please Refer to Page 416

No. 20 and 21 "COMBINATION" FLOAT and THERMOSTATIC STEAM TRAPS

FOR VACUUM AND PRESSURES UP TO 20 AND 40 LBS.



Exterior No. 21 Trap

These Traps will improve the efficiency of any steam heated equipment, over any type of bucket trap, when used for the pressures and capacities for which they are intended.

They are widely used to drain unit heaters, coils, heating systems, process equipment, water heaters, etc.

The number 20 and 21 Traps are the smallest sizes of the "Combination" Float and Thermostatic Traps.

Large Capacity in Low Cost Traps

The extra capacity of these small Traps is one of the carefully designed features, and provides for an extra large valve opening. This large valve orifice is made possible by a principle of construction which takes full advantage of the pressure within the Trap, and also the frictional flow of the discharging water, to help open the valve.

In the sectional illustration it will be seen how the valve is located above, or outside the seat, and in opening merely lifts vertically off the seat in the same direction as the outflowing condensate.

The big advantage of this arrangement is that it permits the use of a larger valve orifice than is possible in most other traps, which have valves opening inward and bucking against the discharging condensate and pressure.

If for any reason the trap becomes overloaded and filled by a sudden flood of accumulated condensate, then the thermostatic air by-pass valve comes into action as a secondary or emergency condensate discharge valve until the flood is relieved. According to conditions, this adds from 25% to 50% to the normal rated capacity of the trap.

Deep Water Seal

A deep water seal is self-contained within the Trap. The outlet tube extends down into the body of the Trap and is always submerged. This prevents escape of any steam, and will hold any vacuum when the Trap is connected in a vacuum return line.

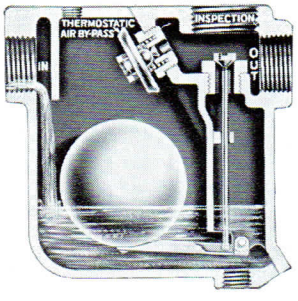
Construction

Straight through horizontal pipe connections—always most desired for economical and easy installation—are provided on these traps. A glance at the interior shows the few working parts—all simple, rugged and well designed for long, hard service and dependability. The float is rigidly fastened to the lever and has a fixed travel so it cannot rub on the inside of the trap. All internal parts are attached to and removable with this cover, which forms one head of the trap.

Body and cover are cast iron, valve and seat are bronze, lever and valve stem are brass, float is laminated copper. The valve and seat are renewable.

A manually operated by-pass on the discharge valve may be supplied at extra cost when ordered.

No. 20 "COMBINATION" TRAP



This illustration shows the No. 20-T "Combination" Trap with Thermostatic Air By-pass. The letter "T" after the size number means "Thermostat," indicating the Trap is furnished with Thermostatic Air By-pass when the letter "T" is given.

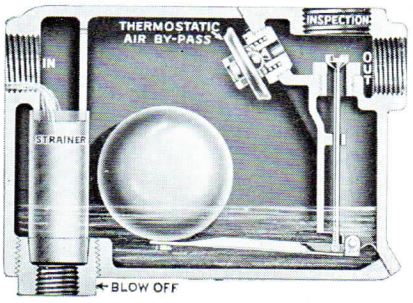
The No. 20 Trap is practically the same as the No. 21 described on the next page, and has the same capacity.

However, the No. 20 Trap does not have a Strainer, and for this reason the body is smaller from inlet to outlet.

Also, only the one Thermostatic Air By-pass for 20 lbs. pressure is used in the No. 20 Trap.

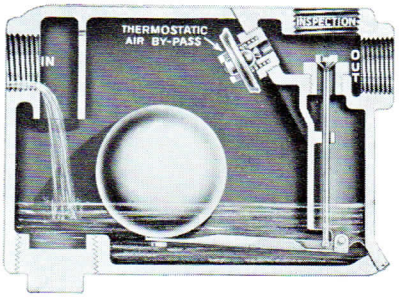
See next page for prices, capacities and dimensions

No. 20 and 21 "COMBINATION" FLOAT and THERMOSTATIC STEAM TRAPS



Above illustration shows the No. 21-C "Combination" Trap with both Thermostatic Air By-pass and Strainer. The letter "C" after the size number means "Complete" indicating the Trap is furnished with both Thermostatic Air By-pass and Strainer, when the letter "C" is given.

No. 21 "COMBINATION" TRAP



This illustration shows the No. 21-T "Combination" Trap with Thermostatic Air By-pass only. The letter "T" after the size number means "Thermostat", indicating the Trap is furnished with Thermostatic Air By-pass only, when the letter "T" is given.

Thermostatic Air By-pass

Two types of Thermostatic Air By-passes, each for different pressure ranges, are available for the No. 21 Trap. The order should specify which type is desired.

One Thermostatic Unit is for service from any vacuum and up to 20 lbs. working steam pressure. This is the single bellows type. When desiring this unit, specify it as the "20-lb. Thermostat."

The other Thermostatic unit is suitable for any vacuum and pressures up to 40 lbs. W.S.P. at a small additional cost. This is our multifold type having 15 corrugations, and is the same durable unit which is used in the larger "Combination" Trap No. 23. When this unit is desired please specify it as the "40-lb. Thermostat."

As long as there is any air in the Trap, the thermostat holds open the air vent valve, rapidly discharging the air as fast as it reaches the Trap. The air is vented into the outlet of the Trap through a port in the Trap cover, which by-passes around the condensate valve. When steam enters the Trap the Thermostat closes the air vent steam tight.

The Thermostatic Air By-pass is placed high up in the top of the Trap, above the usual water level, but, if a flood of condensate reaches the Trap, the air vent will open and serve as an emergency valve to help relieve the overload on 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 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 1/2" blow-off connection for flushing out the Strainer as well as draining the Trap. The Strainer may be omitted if not desired.

List Prices, Weights, Capacities, Dimensions—In Inches

Size number of Trap			20	21
Pipe size inlet and outlet; also Code			1/2 Kokoa	1/2 Karat
Pipe size inlet and outlet; also Code			*3/4 Knoll	*3/4 Kiosk
	Code for Pressure	Pressure in lbs.	Capacity in lbs.	Capacity in lbs.
Capacity in pounds of water discharged per hour at differential gauge pressures as given	Polar	1	360	360
	Poise	3	550	550
	Polka	5	860	860
	Point	10	1245	1245
	Podge	15	1515	1515
	Posey	20	1750	1750
	Poppy	25	....	1965
	Posse	30	....	1175
	Pouch	40	....	1360
Weight in pounds			10	12
Inlet to outlet overall, inches			5 5/8	7 7/8
Width			4 5/8	4 5/8
Height			6 1/2	6 1/2
C/L Pipe connection to bottom			4	4

NOTE—The No. 20 and 21 Traps may also be furnished in bronze —prices on request.

Trap number		List price	Code
No. 20-T	Trap includes the 20 lb. Thermostatic Air By-pass only (no Strainer)	$10.00	Keeve
No. 21-C	Trap includes the 20 lb. Thermostatic Air By-pass; also, Strainer	15.00	Keber
No. 21-T	Trap includes the 20 lb. Thermostatic Air By-pass only (no Strainer)	14.50	Kelso
No. 21-C4	Trap includes the 40 lb. Thermostatic Air By-pass; also, Strainer	16.00	Ketch
No. 21-T4	Trap includes the 40 lb. Thermostatic Air By-pass only (no Strainer)	15.50	Kedge

When ordering—

1—For the No. 21 Trap be sure to specify the letter after the Trap number to designate whether the Trap shall be furnished with both the Thermostatic Air By-pass and Strainer "No. 21C," or "No. 21C4," or with Thermostatic Air By-pass only, "No. 21T" or "No. 21T4."

The No. 20 Trap is furnished with the Thermostatic Air By-pass only as a "No. 20T."

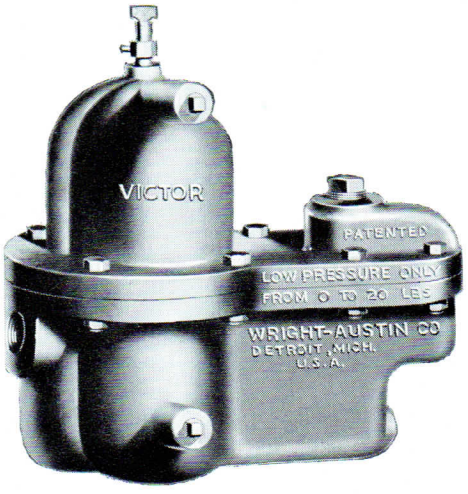
2—Give size of pipe connection preferred. *Indicates pipe size furnished, unless otherwise ordered.

3—State maximum working steam pressure.

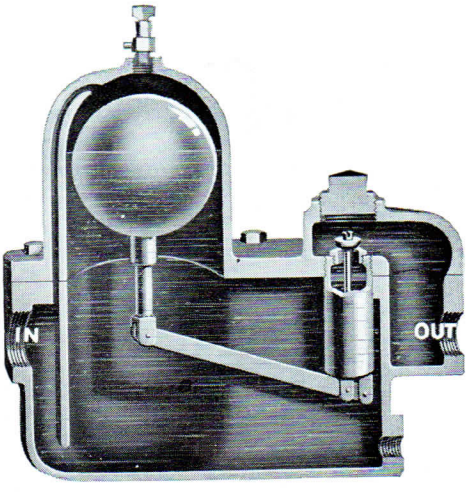
NOTE—No water gauge on number 20 and 21 Traps.

"VICTOR" LOW PRESSURE STEAM TRAP

FOR PRESSURES FROM 0 TO 20 LBS.
SERIES 40



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



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.

Large Capacity

It is especially made for draining large volumes of condensation from low pressure apparatus, such as hot water heaters, coils, heating systems, evaporators, etc. A thermostatic air by-pass as illustrated on the next page may be supplied when specified, at small additional cost.

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.

Accessibility

Straight line, horizontal inlet and outlet pipe connections make the "Victor" Trap economical to install as well as providing easy access to the working parts.

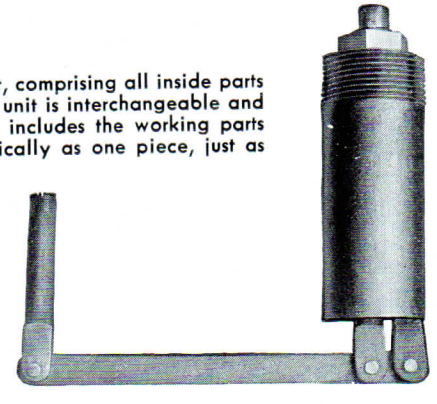
The inside parts are all attached to the cover and may be removed intact to the work bench or to some light open space by simply lifting off the cover, without breaking any pipe connections. The empty body of the Trap remains in place, with pipe connections undisturbed, so that easy access is provided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

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.

A simple single unit, comprising all inside parts except the float. This unit is interchangeable and easily renewable and includes the working parts ready to attach practically as one piece, just as it is shown here.



"VICTOR" LOW PRESSURE STEAM TRAP

SERIES 40

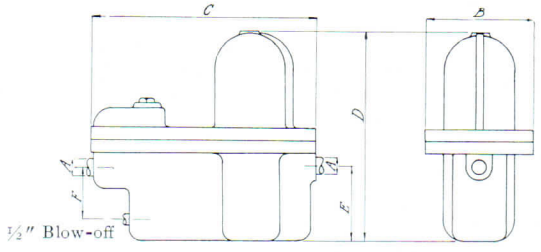
List Prices, Weights, Capacities, Dimensions—In Inches

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

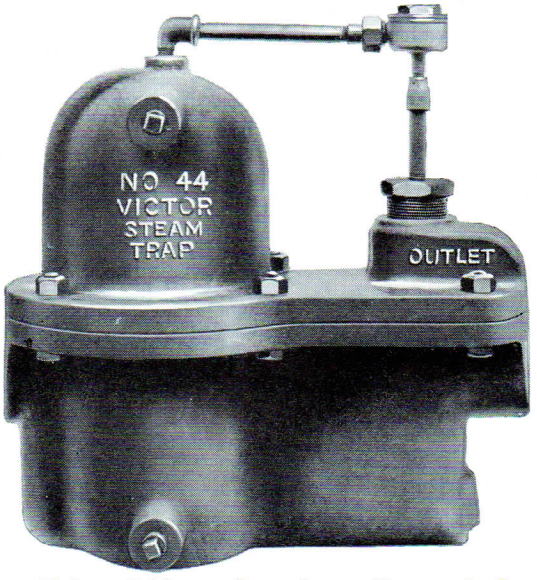
NOTE—When ordering be sure to give size number of Trap.

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 below for all sizes. List Price—$8.00.



FOR LOW PRESSURE AND VACUUM RETURN LINES

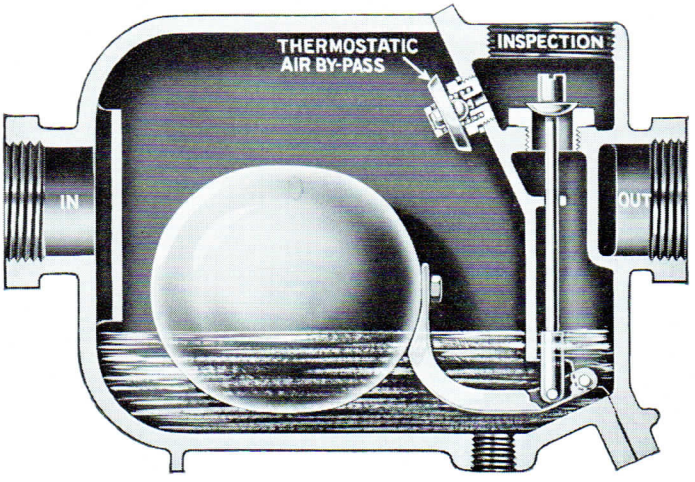


"Victor" Heavy Duty Steam Trap with Outside Thermostatic Air By-pass

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.

No. 25 DRAINER

WORKING PRESSURE UP TO 125 LBS.



No. 25 Drainer with Thermostatic Air By-pass (optional)

Pipe size inlet and outlet 2".

For evaporators, heaters, etc., which require the quick and constant removal of large volumes of condensate, the No. 25 Drainer gives very satisfactory service.

When the starting or peak load is exceptionally heavy, the Drainer will discharge continuously with a wide open valve until the extreme load is relieved.

Cost and Capacity

Economical in first cost and installation, because it is very compactly designed. The No. 25 Drainer is small in size for its large capacity. It has approximately double the capacity of the conventional trap of comparative size and weight.

The oversize opening in the discharge valve in the No. 25 Drainer, makes possible its supercapacity.

This oversize valve opening in turn is the result of a distinct departure in design, which locates the valve itself, entirely outside of the float chamber.

With this arrangement, the valve opens outward above the seat and away from the working steam pressure, and not against it, as is the common practice.

This construction takes full advantage of the working steam pressure within the body or float chamber, plus the frictional force of the discharging condensate, and acting together on the valve, both definitely assist the float to open the valve. In other words, the valve moves with the pressure and in the same outward direction as the discharging condensate.

A clear picture of the location and movement of the valve will be seen in the cut-away view on this page.

What this means can more readily be understood when it is considered that practically all conventional drainers, traps, dischargers, etc. are made with valves located inside the float chamber, and opening inward, which inherently puts a limitation on the size and area of the valve opening, because the valve must be small enough so the float can pull it open inward against the full working pressure.

The outside valve arrangement has the additional advantage of acting as a safety relief valve for accidental excess pressure on the Drainer, or the line in which it is connected. 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.

Construction

Continual research and long experience are represented in the simple design of this Drainer to make it especially suited for efficient and dependable service over a long period of years.

The standard construction has cast iron body and cover, bronze valve and seat, brass lever and stem, stainless steel bearing pin, and strong laminated copper float. Both valve and seat are reversible.

It has straightline, horizontal pipe connections, always easiest to make up and which always helps reduce installation costs.

While the illustration shows screwed pipe connections, the No. 25 Drainer may be furnished with flanged pipe connections, when especially ordered at small additional cost.

Also, a hand-operated by-pass which opens the main discharge valve may be supplied when specified at extra cost.

Another important feature—this one saves steam—and that is the deep water seal, which submerges the lower end of the outlet tube in several inches of water, so steam cannot escape.

The Thermostatic Air By-pass (Optional)

Most steam heat processing, cooking, heating, etc. is in alternating cycles of heating up and cooling off. This produces variable quantities of condensate, as well as air, both of which must be rapidly eliminated, or the efficiency of the main apparatus will be seriously impaired. Keeping the lines cleared of condensate and air is the double function of the Drainer, so it needs an automatic means to discharge the air.

For this purpose, a thermostatic air by-pass is placed inside the Drainer, close up to the top, which vents the air through a port into the outlet; when there is air in the Drainer, the thermostatic element holds open the air vent. This keeps the air removed, as well as quickly relieving the air when starting up cold.

The thermostatic air by-pass is a complete unit in itself, and is detachable. Two types are available, but for different maximum pressures.

One type is for service up to 20 lbs. pressure, and is known as the single bellows type. When desiring this unit, please call it the "20-lb Thermostat."

The other unit is suitable for pressures up to 40 lbs. When the operating pressure is above 20 lbs., then the "40-lb Thermostat" should be specified.

See next page for prices, capacities and dimensions.

NO. 25 DRAINER (continued)

List Prices, Weight, Capacities, Dimensions—In Inches

	Code for pressure	Pressure in lbs.	Capacity in lbs.
Capacity in pounds of water discharged per hour at differential gauge pressures as given	Polar	1	9550
	Poise	3	16420
	Polka	5	21200
	Point	10	30000
	Podge	15	26550
	Posey	20	30680
	Poppy	25	34320
	Posse	30	37500
	Pouch	40	45000
	Poorl	50	21470
	Porch	75	26150
	Plumb	100	32000
	Poker	125	35600

Pipe size inlet and outlet	2
Weight in pounds	45
Inlet to outlet overall, inches (screwed connections)	13½
Width	8
Height	9
C/L pipe connection to bottom	5
For flanged connections (F. to F.) inlet and outlet overall	14¾

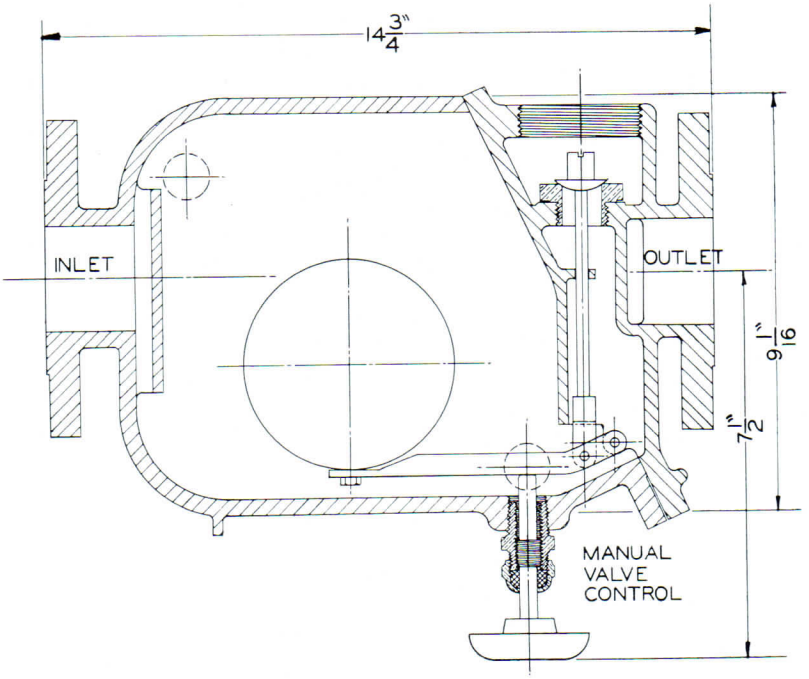
*	2″ inlet and outlet	List price	Code
No. 25-T2	Drainer, including 20-lb. Thermostatic Air By-pass, specify No. 25-T2	$56.00	Knead
No. 25-T4	Drainer, including 40-lb. Thermostatic Air By-pass, specify No. 25-T4	$58.00	Krone
No. 25-P	Drainer—no Air By-pass, but including petcock air vent on cover, specify No. 25-P	$53.00	Kisey
	For 2″ Flanged pipe connections on above Drainers, add	$24.00	Kafle
	For hand-operated By-pass on main discharge valve of above Drainers, add	$18.00	Kalve
	Add for Water Gauge, if wanted	$2.70	Fauge

*When ordering be sure to specify:

1—The Drainer number and letter, to indicate which by-pass or air vent is wanted.

2—Maximum working steam pressure under which this Drainer is to operate.

NOTE—2″ screwed pipe connections will be furnished unless flanged connections are ordered.



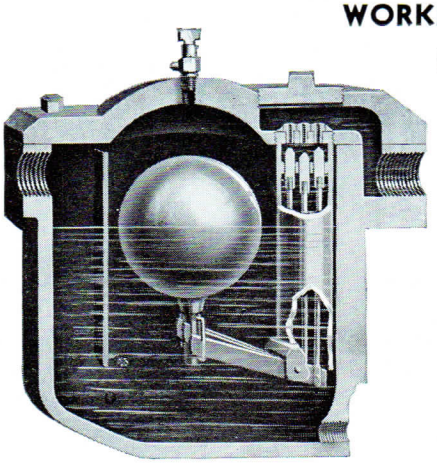
This drawing shows the No. 25 Drainer with 2″ flanged connections, also manual by-pass for opening main discharge valve, but without thermostatic air by-pass.

The No. 25 Drainer may be furnished with either 2″ screwed or flanged connections. With or without thermostatic air by-pass, or with or without the manual by-pass.

"EMERGENCY" 3-VALVE STEAM TRAP

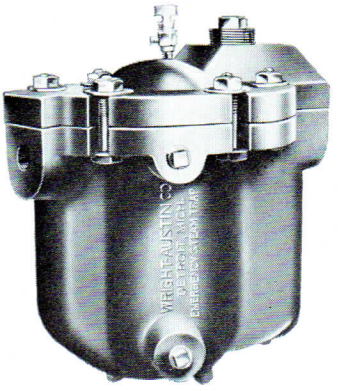
WORKING PRESSURES UP TO 200 LBS.

DRAINER TYPE SERIES 30



Horizontal—Straight-way inlet and outlet pipe connections.

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



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 variable working pressures. No change of parts or adjustments for any working pressures 0 to 200 lbs.

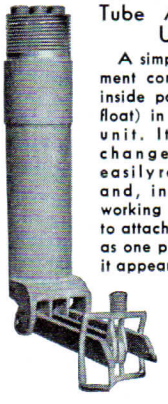
2—Enormous discharge capacity due to the use of three valves—equal to that of three or more ordinary Traps.

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.



Tube Assembly Unit

A simple arrangement combining all inside parts (except float) in one single unit. It is interchangeable and easily renewable, and, includes all working parts ready to attach practically as one piece, just as it appears here.

It will be observed in the table on page 433 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.

When draining coils, 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.

Accessibility

With straight through horizontal inlet and outlet pipe connections the "Emergency" Trap is very simple and economical to install, plus the fact that these connections are in the body of the Trap, so the cover may be lifted off to provide easy access to the inside of the Trap for inspection and cleaning without breaking any pipe joints.

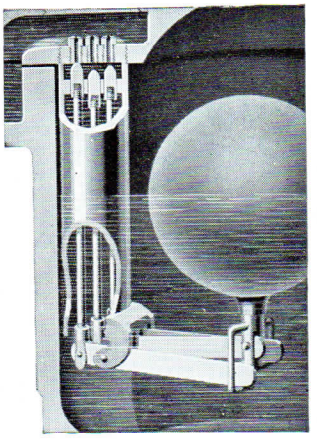
All inside parts are attached to the cover and may be removed intact to the work bench or to some other light open space by simply lifting off the cover. The empty body of the Trap remains in place, with pipe connections undisturbed.

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.

Materials

Lasting quality for absolute dependability and long life is built into the "Emergency" Trap, by the use of first-class materials and skilled workmanship.

The valves and seats are stainless steel selected for this service; the float is steel and electrically laminated; other inside parts are steam bronze, while the valve stems are rolled brass. Body and cover are semi-steel.



Deep Water Seal

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

"EMERGENCY" 3-VALVE STEAM TRAP

DRAINER TYPE SERIES 30

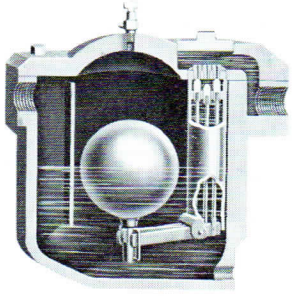


Fig. 1
Showing position of No. 1 Valve open for normal conditions.

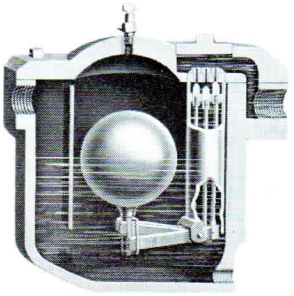


Fig. 2
No. 2 Valve opens wide when the flow exceeds capacity of No. 1 Valve.

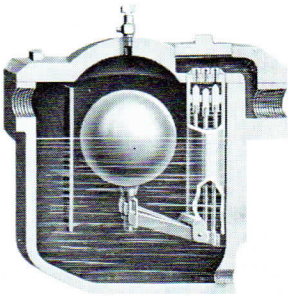


Fig. 3
Then No. 3 Valve opens, giving full emergency capacity of Trap.

Operation

The three principal positions of the valves during the course of operation is shown in the three illustrations above.

The valves are controlled by the 3-step stirrup attached beneath the float. The lever which operates No. 1 valve (center) is fastened to the stirrup and moves rigidly with the float. The levers attached to the outside valves, No. 2 (left) and No. 3 (right), each have a slightly different amount of lost motion in the side slots of the stirrup.

As the float rises it first opens valve No. 1, followed at slightly later intervals by valve No. 2 and then by valve No. 3.

The natural weight of each lever, plus the steam pressure in the Trap will keep the valves closed unless held open by the float for discharging.

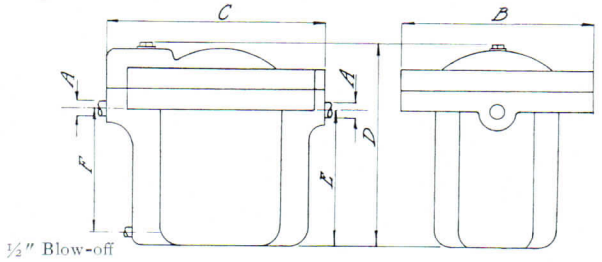
"Emergency" Steam Traps—Series 30

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

NOTE—When ordering be sure to give size number of Trap.

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



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.

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 lifting power of the float sufficiently to overcome the steam pressure against each valve—and open it with a slight jerk.

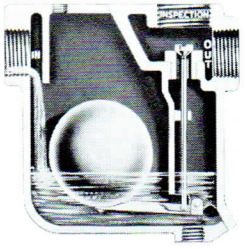
The instant the valve leaves its seat, the resistance on the float is released so that it then rises higher out of the water, thus quickly pulling the valve wide open, without throttling effect or wire drawing.

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.

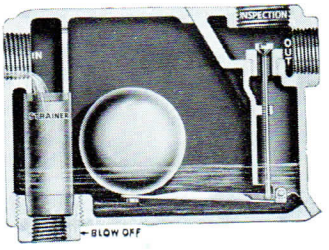
On extremely light service where there is not enough condensation to keep one valve open all the time, the one valve will open and shut alternately, discharging small amounts of condensation intermittently, although continuously draining the device or pipe to which it is attached. This action takes place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

NOTE—The "Emergency" Trap is also available in cast steel or bronze—prices on request.

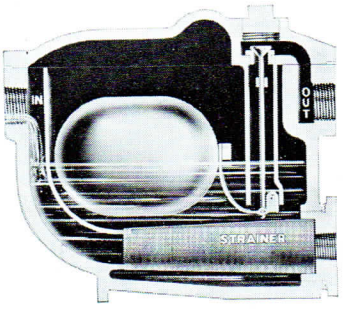
SMALL FLOAT TRAPS
WORKING PRESSURES UP TO 125 LBS.



No. 20 Trap
0 to 40 lbs.
No Strainer in this Trap



No. 21 Trap
0 to 100 lbs.
Strainer optional



No. 23 Trap
0 to 125 lbs.
Strainer optional

This is the simple form of the No. 20, 21 and 23 Float Traps, without the Thermostatic Air By-pass.

They provide low cost, small, compact float Traps of liberal capacity, but carry the Wright-Austin high standard of quality.

Straightline, horizontal inlet and outlet pipe connections make these Traps easy and economical to install.

Strainer in No. 21 and 23 Traps

The Strainer is optional in either the No. 21, or No. 23 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 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 1/2″ blow-off connection for flushing out the Strainer as well as draining the Trap.

In regular operation, these Traps carry a deep water seal completely submerging the outlet tube in from 1 1/2″ to 2″ of water, and preventing escape of any steam.

These Traps are well made in every way and have but few parts. The float is rigidly attached to the lever and moves in a fixed vertical plane, and cannot touch inside wall of Trap.

List Prices, Weights, Capacities, Dimensions—In Inches

Trap number		List price	Code
No. 20-P	Trap includes Pet Cock Air Vent, but without Strainer	$ 8.50	Kinet
No. 21-P	Trap includes Pet Cock Air Vent, but without Strainer	12.00	Koval
No. 21-S	Trap includes Strainer and Pet Cock Air Vent	12.50	Kraft
No. 23-P	Trap includes Pet Cock Air Vent, but without Strainer	16.00	Kasky
No. 23-S	Trap includes Strainer and Pet Cock Air Vent	17.00	Kacey

When ordering—
1—Be sure to specify letter "S" after Trap number if Strainer is desired. No Strainer in number 20 Trap.
2—Give size of pipe connections preferred—*Indicates pipe size furnished unless otherwise ordered.
3—State maximum working steam pressure.
NOTE—Water Gauge for No. 23 Trap, List Price $2.70. Code "Fauge". Not furnished unless ordered. No water gauge on number 20 and 21 Traps.

Size number of Trap		No. 20	No. 21	No. 23
Pipe size inlet and outlet; also code. (Specify pipe connection desired)		1/2 Knack *3/4 Knife	1/2 Karat *3/4 Kerme	3/4 Kappa 1 Krimp *1 1/4 Knabe
	Code for Pressure	Pressure in Lbs.	Capacity in Lbs.	Capacity in Lbs.	Capacity in Lbs.
Capacity in pounds of water discharged per hour at differential gauge pressures as given	Polar	1	350	350	1125
	Poise	3	550	550	1945
	Polka	5	860	860	2500
	Point	10	1245	1245	3540
	Podge	15	1515	1515	4275
	Posey	20	1750	1750	5015
	Poppy	25	1965	1965	5655
	Posse	30	1175	1175	6195
	Pouch	40	1360	1360	7150
	Poorl	50	....	750	3000
	Porch	75	....	900	3675
	Plumb	100	....	1050	4250
	Poker	125	....	....	3560
Weight in pounds			10	12	25
Inlet to outlet overall, inches			5 5/8	7 7/8	9 1/4
Width			4 5/8	4 5/8	5 5/8
Height			6 1/2	6 1/2	7 1/2
C/L Pipe connections to bottom			4	4	5

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.

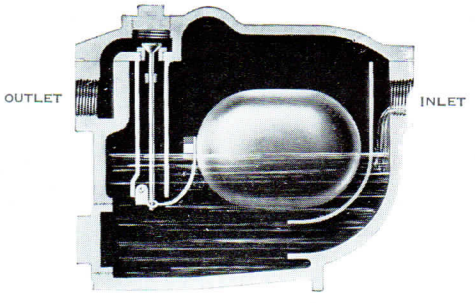
The best practical method of draining an Oil Separator is with a good automatic Trap of the closed float type. This Trap must have a large valve opening, so it will easily handle any thick, gummy oil from the Oil Separator without choking up the Trap.

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.

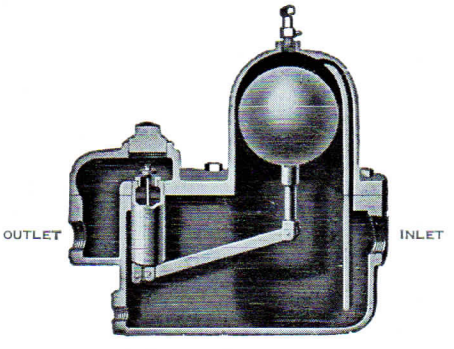
The "Victor" and "Combination" Traps are extremely simple and have but few parts, and are sturdily built for long life of reliable service. Today, thousands are in use as "oil and grease" Traps draining Oil Separators.

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" Float Trap

A strainer is not recommended on any Oil Trap.



"Victor" Float 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	Kisme	Kimes	Krisk	Kemps
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 number of each Trap wanted.

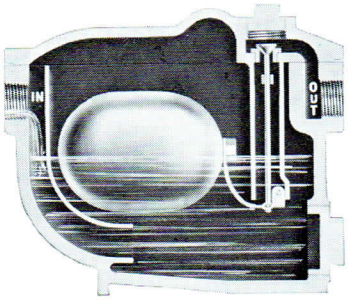
If working pressure is above 20 pounds, then ask for our recommendations, and give us:

1—Pipe size of Oil Separator.

2—Highest working steam pressure on Separator.

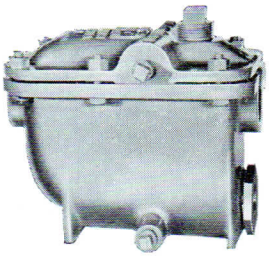
TRAPS FOR DRAINING COMPRESSED AIR LINES

NO. 23-AC FLOAT TRAP



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

Working Pressures 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.

No. 23-AC Float Trap

List Prices, Weight, Capacities, Dimensions—In Inches

Size Number of Trap	Size No. 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
Discharge capacity in lbs. of water per hour at differential gauge pressures of 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.

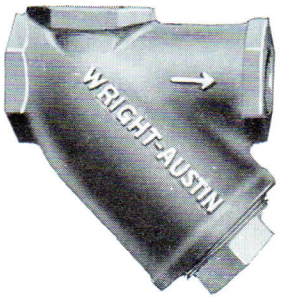
All Traps for compressed air are valved for 125 lbs. working pressure, unless a lower pressure is specified on the order.

When ordering be sure to specify:

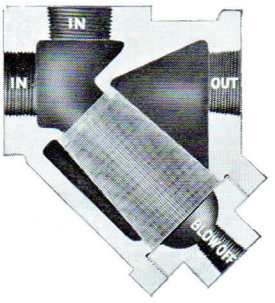
1—Size Number of Trap.
2—Pipe size desired on each Trap.
3—Maximum working pressure for each Trap.
4—Mention that Traps are for compressed air service.

NOTE—The No. 23-AC Trap is also made in bronze—prices on request.

STRAINERS
FOR STEAM, AIR, GAS, OIL OR WATER

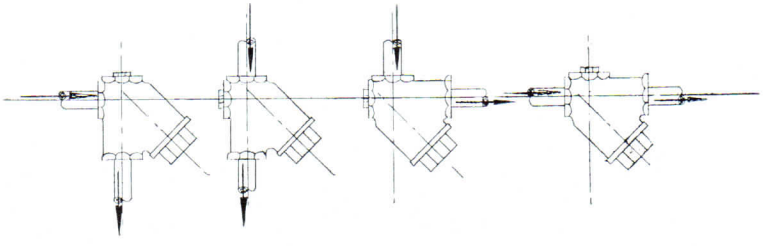


"TUWAY" STRAINER



Will stop scale and other foreign matter from passing into steam traps, pressure reducing valves, and other places where pipe line debris causes trouble.

By removing the gritty substances, it takes the teeth out of the steam and water, which constantly gnaws away and cuts out steam trap valves, reducing valves, etc., and also prevents choking up small orifices. Undoubtedly, nine-tenths of all trap ills are caused by scale and dirt passing into the traps. This can positively be prevented by a Wright-Austin Strainer, which will not only eliminate the greatest source of trap trouble and repairs, but insure longer life to traps and reducing valves.



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 this Strainer is extremely sturdy, simple and compact and is made with a cast semi-steel body.

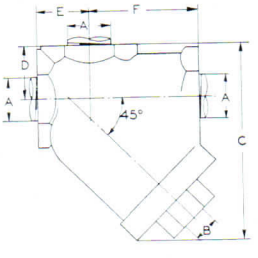
The screen, as regularly furnished, is made of perforated sheet brass having 400—$\frac{1}{32}$" holes per sq. in. Because of its cylinder shape, the open area of the screen is several times greater than the area of the pipe connection. The screen is securely held at both ends. The perforation of the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

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

The regular semi-steel Strainers are suitable for pressures up to 300 lbs. For prices on Strainers above 300 lbs. please give maximum pressure and temperature.

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	$\frac{1}{2}$	$\frac{1}{2}$	$4\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$2\frac{7}{8}$	4	$3.00	Targe
10	$\frac{3}{4}$	$\frac{1}{2}$	$4\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$2\frac{7}{8}$	4	3.50	Tends
12	1	$\frac{1}{2}$	$6\frac{1}{8}$	$1\frac{5}{8}$	$1\frac{5}{8}$	$3\frac{3}{8}$	10	4.00	Thumb
12	$1\frac{1}{4}$	$\frac{1}{2}$	$6\frac{1}{8}$	$1\frac{5}{8}$	$1\frac{5}{8}$	$3\frac{3}{8}$	10	5.00	Taste
14	$1\frac{1}{2}$	$\frac{3}{4}$	$7\frac{1}{2}$	$2\frac{1}{8}$	$2\frac{1}{8}$	$3\frac{1}{4}$	17	8.00	Trast
14	2	$\frac{3}{4}$	$7\frac{1}{2}$	$2\frac{1}{8}$	$2\frac{1}{8}$	$3\frac{1}{4}$	17	10.00	Twarm



All sizes carried in stock.

NOTE—The "Tuway" Strainer is also made in bronze—prices on request.

"KLEERVU" SAFETY EYE GUARD AND GAUGE GLASS PROTECTOR

FOR STEAM BOILERS AND OTHER HIGH PRESSURE EQUIPMENT

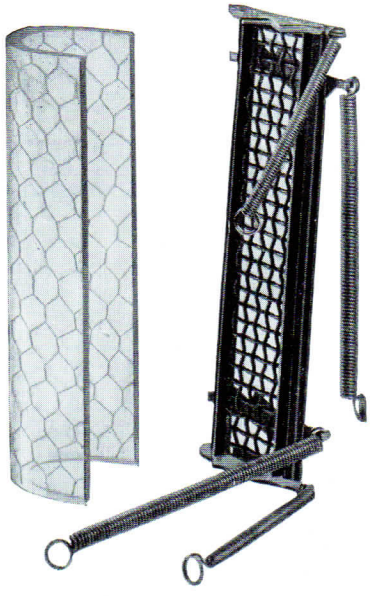


Illustration No. 1

Illustrating the complete Protector—consisting of glass and frame. Note the clear, heavy "U" shaped wire glass which has an average thickness of ½".

A metal frame carries the Protector glass and holds it firmly by two springs. The screen, which forms the back of the frame, povides a large open vent area for the escaping steam and hot water when the gauge glass breaks, so there is no pressure built up inside the Protector.

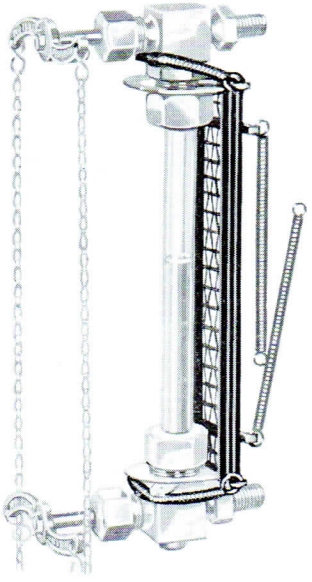


Illustration No. 2

This picture shows how the frame is placed back of the water gauge and securely held by two small springs, which pass around the water gauge valves and are hooked to the opposite side of the frame. This arrangement provides flexibility so it will easily fit different makes of water gauges. There is no change or alteration of any kind on the water gauge.

The Protector frame is entirely out of the way for replacing the gauge glass.

Illustration No. 3

The heavy "U" shaped Protector glass is held firmly in the metal frame by the two springs on the frame, which are hooked around the glass near each end. When a gauge glass explodes, you simply unhook one end of each spring, lift off the Protector glass, insert a new gauge glass, and put on the Protector glass. The Protector frame remains in place undisturbed.

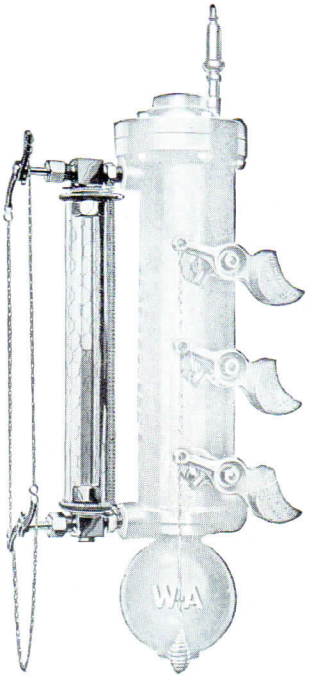


Illustration No. 4

A clear view of the water level from all directions, except the back. There is no loss of vision or blind spots because no part of the Protector frame is in the way. It will also be observed how completely the gauge glass is enclosed, so there is no possible chance for the sharp flying pieces of an exploded gauge glass getting beyond the "Kleervu" Protector.

The very positive protective features of the "Kleervu," has claimed the interest of well known Steamship Lines, Officials, and Safety Engineers, because it provides a very low cost of insurance against serious hazards.

Tubular gauge glasses do explode without warning, so there is a definite "danger zone" around the gauge glasses on steam boilers, pressure tanks, etc.

How It Protects

The "Kleervu" Safety Gauge Glass Protector prevents injury from exploding gauge glasses. It confines within the Protector the dangerously sharp, flying pieces of shattered gauge glass.

When Gauge Glasses Explode

When replacing a gauge glass you simply unhook the two springs holding the Protector glass and lay it aside. Put in the new gauge glass in the usual way. Then the Protector glass can be wiped off and replaced. All completed in a few minutes, and without removing the Protector frame.

Be sure to put on the Protector glass for the safety of your eyes before turning pressure on the gauge glass.

Clear View from Three Sides

The heavy "U" shaped Protector Glass of the "Kleervu" gives you a clear view and easy reading of gauge glass from the front and both sides. No rods to dodge, or brackets to interfere with visibility of the liquid level. There are no blind spots, and therefore no visibility is lost.

"KLEERVU" SAFETY EYE GUARD AND GAUGE GLASS PROTECTOR

THE "KLEERVU" PROTECTOR FITS ALMOST EVERY TUBULAR GLASS WATER GAUGE

Simplicity

The "Kleervu" Safety Protector is extremely simple. It consists of only two principal parts—the Protector Glass, and the Frame. These are illustrated in cut No. 1.

Easily Attached

The "Kleervu" Protector can be put on nearly any water gauge in a couple of minutes, and requires no wrenches or special tools to attach it.

First, place the frame behind the water gauge. Then put the two smaller springs at the end of the frame, around the water gauge fittings, and hook these springs at points provided on opposite side of the frame. This should put the frame in proper position.

Next, place the Protector Glass over the water gauge and up against the frame. Then put the other two springs around the Protector Glass and hook them at points provided on opposite side of the frame. This makes the installation complete as pictured in the illustration No. 3 at the left.

Illustration No. 5

PROTECTOR "U" GLASS

The thick "U" shaped Protector glass is especially made for this service and is not affected by the temperature of the discharging hot water and steam when the gauge glass explodes.

It is a very substantial wire-inserted glass, and has an average thickness of ½".

DIRECTIONS FOR ORDERING THE "KLEERVU"

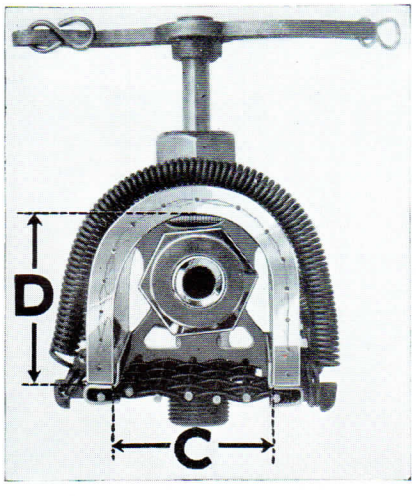


Illustration No. 6

The "Kleervu" Protector has been simplified to one standard size described herein, which experience has proven, fits practically all makes of water gauges using tubular glasses.

Size of the No. 21 "Kleervu" glass.

Diameter "C" 3"
Depth "D" 2½"
Length "A" as required.

1. Give the exact distance "A" (as shown at right) between the guard rod holders on the top and bottom water gauge valves. This determines the length of the Protector to be furnished, and also the cost. (See list prices for different lengths).

2. Give diameter "B" of packing nut as measured across the corners.

3. Specify on order if water gauge has flanged connections to water column.

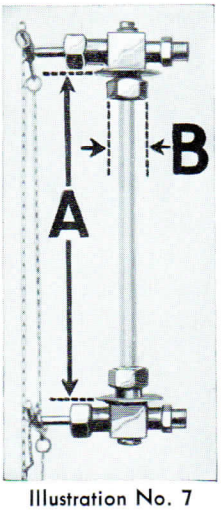


Illustration No. 7

No. 21 "KLEERVU" PROTECTOR

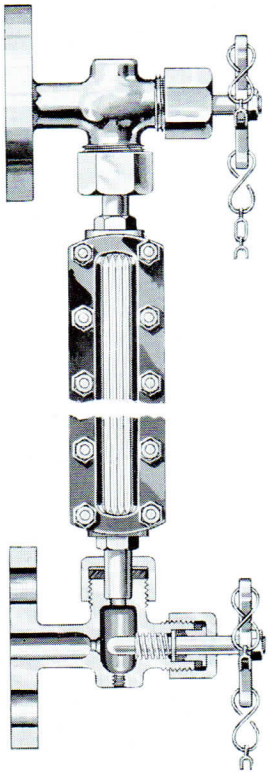
List Prices and Weights Code—Khaki

"Length "A"	Wgt. Lbs.	List Price
4" to 7" inclusive	7	$17.00
8" to 9" "	9	18.00
10" to 11" "	11	19.00
12" to 13" "	13	20.00
14" to 15" "	15	21.00
over 15"	(1 lb. per inch)	1.40 per in.

WATER GAUGE FOR MARINE SERVICE

NO. 402 QUICK CLOSING TYPE

This Water Gauge is approved by the Maritime Commission and used on many Maritime Ships and others.



No. 402 Water Gauge shown with reflex glass. Standard size ¾" O.D. tubular glass may be used also.

The No. 402 Water Gauge is of heavy Bronze construction, and designed to meet the rigid requirements of Marine Service.

The quick closing feature of this Water Gauge adds an important factor of safety for the boiler operator.

When the glass breaks, (especially tubular glasses) one pull of the chain from the floor or platform, shuts off instantly, both the steam and water without risk of the operator being scalded while trying to close the gauge valves. Only a quarter turn closes or opens both top and bottom valves together, as quadruple threads are used on the valve stems.

The No. 402 Water Gauge has rounded valve bodies which make a neat, substantial appearance. They are given a wire brush finish. The bronze body and flange are cast integral in one piece. Flanges are faced and drilled to suit specifications.

The glass packing nuts have large washer space to insure freedom from leakage, with a minimum of compression.

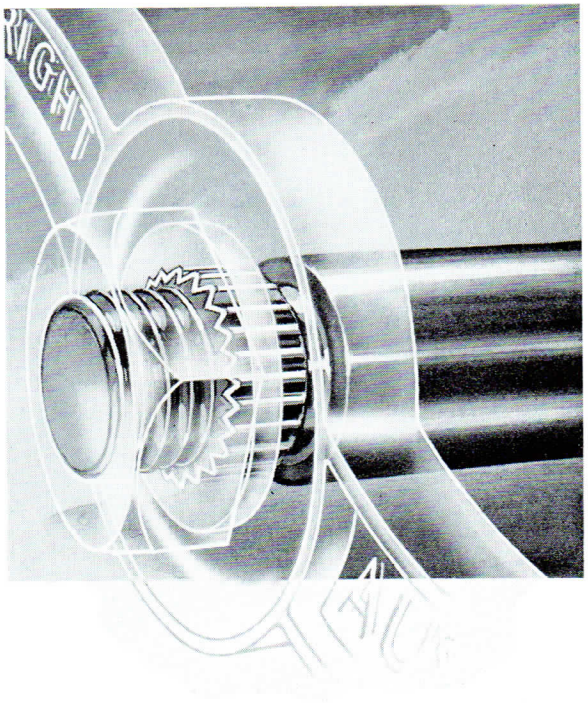
Also, the valve stems are made with deep packing space for free operation without binding.

Standard sizes of flat glass inserts with ¾" end stems or ¾" O.D. tubular glasses may be used.

Flanged pipe connections are ..... ¾"
Size of gauge glass ..... ¾"
Blow-off is tapped ..... ½"
Weight ..... 12 lbs.
Code word ..... Jetty

Four feet of chain is furnished to connect top and bottom levers.

Moistening of the glass will permit tight packing washers to slip on easily.



This illustration shows the non-slip "Splined" method of attaching the lever to the valve stem, used exclusively on Wright-Austin Water Gauges.

This fastening is very positive and rigid, and at a glance it will be seen there is no chance for slippage.

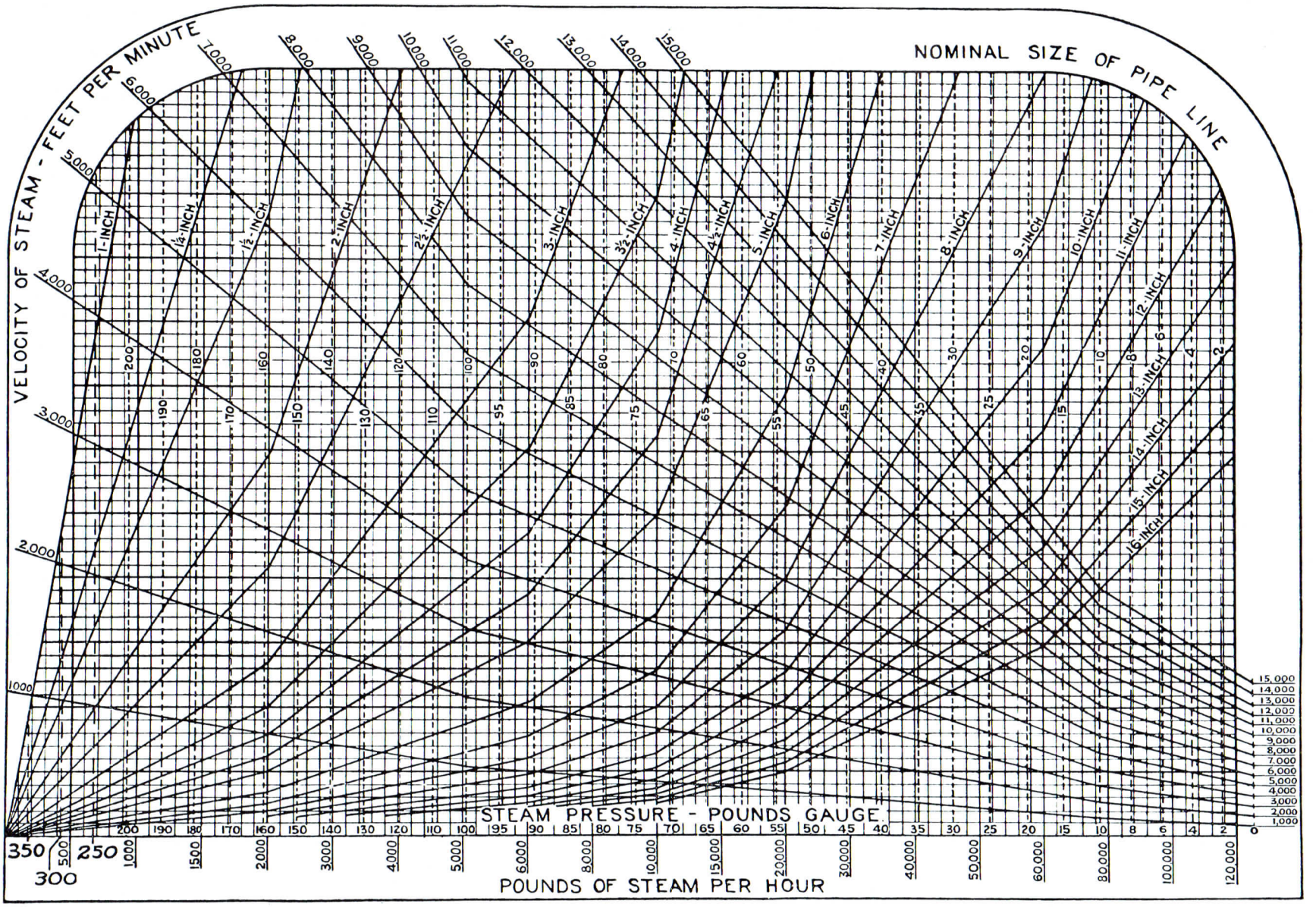
Also, it has the advantage of close graduations of adjustment so that both upper and lower levers may be kept in perfect alignment for tightly shutting off both valves together, instantly.

Furthermore, when an adjustment is necessary, it is extremely simple and easy to make.

Every Engineer will appreciate the advantage of the "Splined" method, over the set screw in the lever, because set screws do work loose. This allows one or both levers to slip and results in the uncertain opening of one valve or the other which will produce a false water level reading in the gauge glass.

This cannot happen on a Wright-Austin Water Gauge.

Steam Velocity in Pipe Lines



This chart is a great time-saver in calculating velocities, discharge and size of pipe required for given condition of flow.

EXAMPLE: (1) Allowing a velocity of 5,000 feet per minute, what size of pipe is necessary to deliver 8,000 pounds of steam per hour at 120 pounds gauge?

SOLUTION: Trace 5,000 foot velocity line to 120 pounds gauge. From intersection follow horizontally to 8,000 pounds of steam per hour. Read nearest size of pipe, viz., 4 inches.

EXAMPLE: (2) Find velocity of steam in a 6-inch pipe delivering 20,000 pounds of steam per hour at 85 pounds gauge?

SOLUTION: Trace the line representing 20,000 pounds per hour to intersect 6-inch pipe. Follow horizontally to 85 pounds gauge pressure and read 7,350 feet per minute.

EXAMPLE: (3) Allowing a velocity of 6,000 feet per minute through an 8-inch pipe, find the pounds of steam per hour at 100 pounds gauge?

SOLUTION: Trace the 6,000 velocity line to intersect 100 pounds pressure line. Follow horizontally to 8-inch pipe line and read at that point 32,300 pounds of steam per hour.

REASONABLE VELOCITIES FOR FLUID FLOW THROUGH PIPES

Fluid	Gage Press.—Lbs. per sq in.	Service	Velocities—Ft. per min.
Saturated Steam	0-15	Heating Mains	4000-6000
Saturated Steam	50-up	Miscellaneous	6000-8000
Superheated Steam	200-up	Turbine and Boiler Leads	10000-15000
Water	25-40	City Service	120-300
Water	50-150	General Service	300-600
Water	150	Boiler Feed	600

SATURATED STEAM CAPACITY OF EXTRA STRONG WROUGHT IRON OR STEEL PIPE. LBS. PER HOUR AT VELOCITY OF 6000 FT. PER MINUTE

Size of Pipe	Gauge Pressure											
	5	25	50	75	100	150	200	250	300	400	500	600
1/2"	30	55	90	120	150	210	270	330	390	495	660	740
3/4"	55	100	160	220	280	390	510	620	730	930	1150	1390
1"	90	170	270	390	460	650	840	1020	1200	1530	1900	2280
1 1/4"	160	300	480	650	820	1150	1490	1830	2160	2760	3410	4100
1 1/2"	220	470	660	900	1100	1600	2060	2550	3000	3820	4750	5700
2"	370	700	1100	1500	1900	2680	3450	4200	4980	6350	7900	9450
2 1/2"	525	1000	1600	2175	2750	3950	4950	6050	7150	9120	11300	13600
3"	800	1600	2500	3350	4250	6000	7700	9450	11200	14200	17700	21300
3 1/2"	1100	2100	3400	4550	5700	8050	10200	12700	15000	19100	23700	28500
4"	1450	2750	4300	5850	7400	10450	13450	16400	19200	24400	30400	36500
5"	2300	4400	6800	9300	11700	16500	21200	26000	30800	39300	48800	58500
6"	3200	6200	9800	13200	16800	23700	30800	36900	44000	56000	69700	83500
8"	5700	10800	17100	23300	29300	41300	53100	65200	76800	98000	121000	145500
10"	9300	17800	28100	38000	48100	67500	87100	106500	126000	160000	200000	240000
12"	13500	25800	40700	55300	69700	98500	126500	154700	183100	233000	290000	347000

RELATIVE VOLUME OF FREE AIR TO AIR AT VARIOUS PRESSURES

Gage Pressure Pounds	Volume of Free Air per cu. ft. of Comp. Air	Volume of Compressed Air per cu. ft. of Free Air	Gage Pressure Pounds	Volume of Free Air per cu. ft. of Comp. Air	Volume of Compressed Air per cu. ft. of Free Air	Gage Pressure Pounds	Volume of Free Air per cu. ft. of Comp. Air	Volume of Compressed Air per cu. ft. of Free Air
0	1.00	1.000	40	3.72	.269	100	7.80	.128
1	1.07	.936	45	4.06	.246	110	8.48	.118
2	1.14	.880	50	4.40	.227	120	9.17	.109
3	1.20	.830	55	4.74	.211	130	9.84	.102
4	1.27	.786	60	5.08	.197	140	10.52	.095
5	1.34	.746	65	5.42	.184	150	11.20	.089
10	1.68	.595	70	5.76	.173	160	11.88	.084
15	2.02	.495	75	6.10	.164	170	12.56	.080
20	2.36	.424	80	6.44	.155	180	13.24	.075
25	2.70	.370	85	6.78	.147	190	13.92	.071
30	3.04	.329	90	7.12	.140	200	14.60	.068
35	3.38	.296	95	7.46	.134			

From Standard Authorities

RATES OF CONDENSATION

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.

TABLE 1

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	

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.**

INDEX OF TELEGRAPHIC CODE WORDS IN THIS BOOK

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