WRIGHT-AUSTIN

Steam Traps

Air Eliminators

Strainers

BULLETIN NO. 201

WRIGHT-AUSTIN CO.
DETROIT, MICH., U. S. A.

Wright-Austin Company

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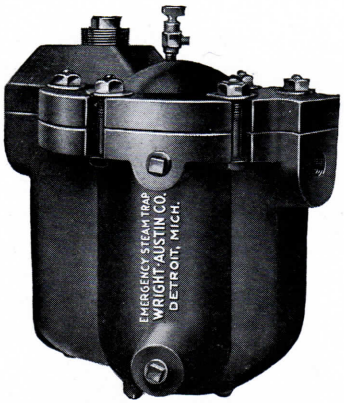
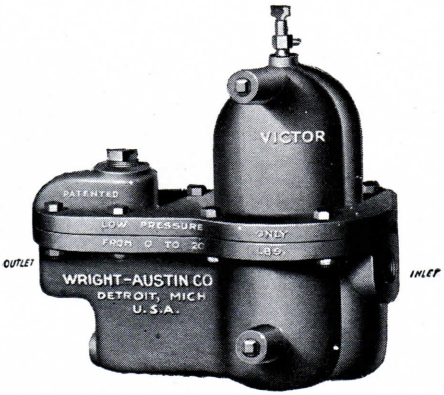
Wright-Austin Steam Traps



"Emergency" High Pressure Type



"Victor" Low Pressure Type

THE policy of manufacturing one type of Trap and forcing it to cover all pressures was superseded by the Wright-Austin Company a long time ago. Instead, two distinct types of non-return Traps have been developed, the "Emergency" for Variable and High Pressure and the "Victor" for Low Pressure, as illustrated above. Both types are made in a complete range of sizes, so there is a Wright-Austin Trap to meet practically every condition, exactly as that condition should be handled. This is a unique feature of this line.

The use of a water gauge is optional, although the necessary openings are tapped in every Trap and plugged.

HOW TO BUY STEAM TRAPS

Select a high pressure type for high pressure service and a low pressure type for low pressure service (see pages 4 and 12).

For size, determine the maximum amount of condensation to be discharged at a given pressure, in accordance with tables in the back of this Bulletin, then select a size of Trap having suitable capacity to handle the condensation at that pressure. Use tables on pages 9 and 15 for the last part of the calculation.

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

Before purchasing make this comparison of the different Traps. Divide the net price of the Trap by the capacity of the Trap in thousands of pounds of water per hour; the result will be the cost of the Trap per unit of work, that is per one thousand pounds of water per hour.

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

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

STEAM TRAPS AND YOUR COAL PILE

Probably no one device in all your steam plant—cost for cost—carries anything like such enormous steam saving possibilities as your Steam Trap, if given proper attention, yet it is often the most abused and neglected article about the plant. Probably no one thing so vitally affects the operation of your Steam Trap as does scale and grit from the pipe lines, yet it is amazing how few operating engineers take this problem seriously.

Thousands of Steam Traps are today connected up to important steam separators, headers, heating apparatus, cookers, etc., without as much as a shut-off valve, making it impossible to shut them off, so they get no attention, and are never cleaned out, until finally at the expense of the coal pile, they go out of business.

Many engineers think of Steam Traps as sort of rough and ready, low priced devices, and that it doesn't matter where they are located or how they are piped up. Too often they are the last pieces of equipment to be installed and are crowded down in a pit, or some inaccessible place, where it is almost impossible to get at them.

But your Steam Trap is one of the hardest working units in your entire plant. Even when most of the machinery is shut down, that little Trap is working nights and Sundays, 24 hours a day without a stop, going through thousands of operations, automatically discharging the condensation and saving the steam. Perhaps you have never thought about a Steam Trap in this way before, but it's a pretty important unit of your steam plant, isn't it?

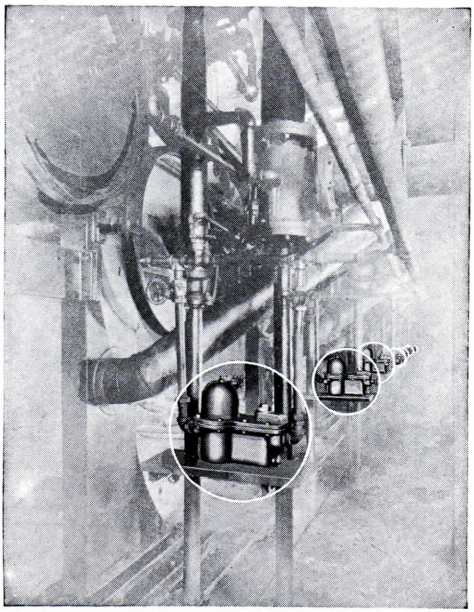
Then make it a point to have the Trap get-at-able. Install it in a convenient and accessible place. Do not contribute to neglect by improper installation. Always have a shut-off valve on the inlet pipe, or better still have a by-pass as shown on page 17, so that you can give the Trap proper attention at any time.

Every Trap should be blown off frequently to keep it clean from dirt and scale, just as you blow off your boilers; so make it convenient to open the blow-off valve on the Trap.

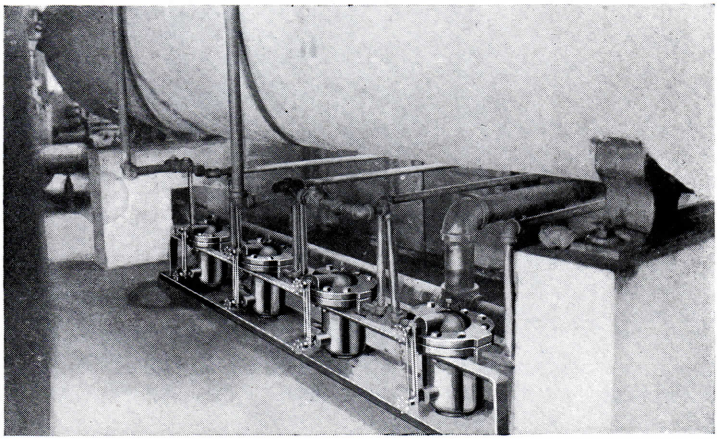
The proper installation of a Steam Trap, at the lowest point to be drained, makes it the natural receptacle for all the scale and foreign matter in the entire system. Either you must blow off and clean out the Trap frequently, or stop the debris from getting into it. The latter method is preferable and most economical. A simple, inexpensive Wright-Austin Strainer on the inlet pipe to a Trap will remedy nine-tenths of all Trap ills.

Take good care of your Steam Trap. It's worth it, and will prove its worth to you by saving tons of fuel.

TYPICAL GOOD INSTALLATIONS OF STEAM TRAPS



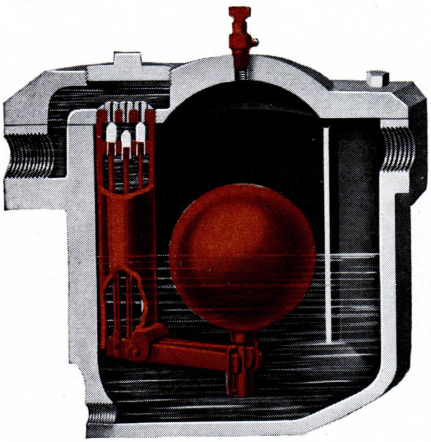
Seven Wright-Austin "Victor" Steam Traps Draining Paper Machines at the Monroe Binder Board Company, Monroe, Michigan



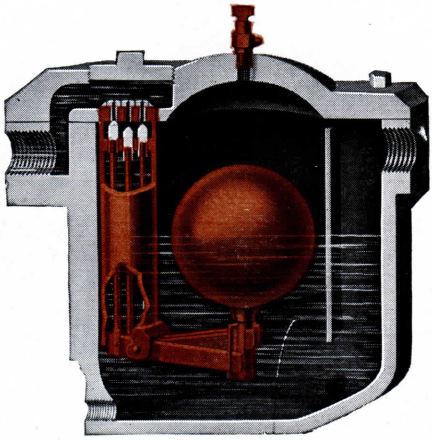
Four Wright-Austin "Emergency" Steam Traps Draining the Main Steam Header of a Large Industrial Plant

Note — The latest type of "Emergency" Steam Trap has the water gauge entirely on the body of the Trap.

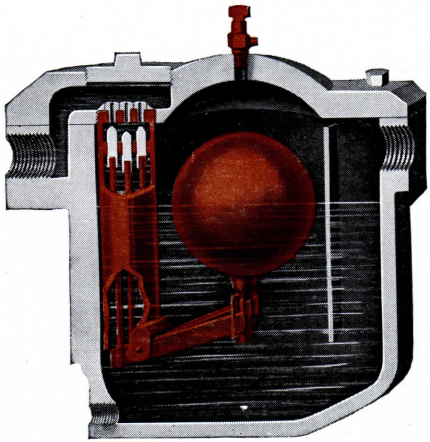
THE WRIGHT-AUSTIN "EMERGENCY" HIGH PRESSURE 3-VALVE STEAM TRAP



Showing position of No. 1 Valve open for normal conditions



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



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

THIS TRAP IS PRACTICALLY THREE TRAPS IN ONE

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

1—Enormous discharge capacity due to the use of three valves—equal to that of three or more ordinary Traps.
2—Automatic regulation of the Trap to any service, heavy or light.
3—Almost complete elimination of throttling effect and wear on valves and seats.
4—Perfect adaptation for any working pressure. No change of parts or adjustments except for pressure over 200 lbs.

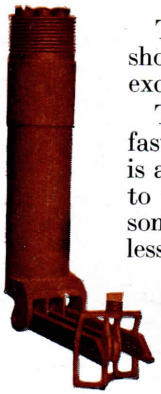
The Emergency Trap operates on the principle of three separate units, by putting one valve after another into service as the amount of condensation requires, each valve acting as a separate unit. Or, all three valves will instantly open wide for "Emergency" slugs or floods of condensation. When the rate 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 service by the fact that they open and close progressively.

This also has an important effect on the capacity of the Trap at different pressures. It will be observed in the table on page 9 that the CAPACITY OF THE "EMERGENCY" TRAPS INCREASE IN REGULAR PROGRESSION as the pressure is increased. This is a distinct and unique advantage as compared with a one valve Trap, because in the case of a ONE VALVE TRAP at pressures over about 75 lbs., the VALVE ORIFICE MUST BE GREATLY REDUCED to enable it to function. THIS CUTS DOWN THE CAPACITY OF MOST OTHER TYPES as much as one-half, instead of increasing the capacity as pressure is increased.

On account of the three valve design giving the "Emergency" Trap much greater capacity than ordinary Traps, it is very often possible to use an "Emergency" Trap which is smaller (measured by size of inlet and outlet) than other makes required for the same service. This is a very distinct economy in the cost of the Trap.

CONSTRUCTION



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

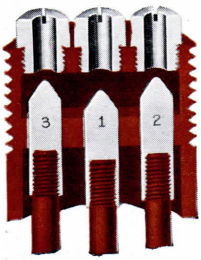
The illustration at the left marked "Tube Assembly" shows the simple, inside assembly unit of all working parts except the float, with valves in a closed position.

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

A round, seamless, strong, high pressure copper float is used in the "Emergency" Trap. Traps are so designed that floats do not become dented,

battered or weakened by shipment, no matter how far Traps may go. All other inside parts are brass except the valves and seats which are of monel metal. The body and cover of the Trap are semi-steel of heavy design for high pressure.

MONEL METAL VALVES AND SEATS



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

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

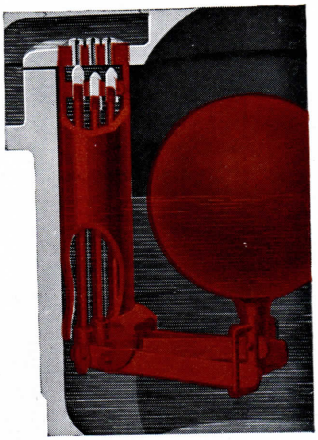
Furthermore, they are located in the TOP OF THE TRAP, AWAY FROM THE SCALE AND SEDIMENT, and by opening wide each time make a combination of three valuable features found in no other Steam Trap. This greatly increases the life and durability of the valves and seats.

OPERATION

The three principal positions of the Trap in the course of operation are shown by cuts on page 4 and the details of the valves are shown in cuts on this page.

The valves are controlled by the 3-step stirrup attached to the float. Unless held open by the buoyancy of the float, the weight of the levers plus the pressure on the Trap will keep the valves closed. When each valve operates, or leaves its seat, it opens practically wide without wire drawing or throttling effect, ALMOST ENTIRELY ELIMINATING THE WEAR ON THE VALVES AND SEATS, and insuring steam tight valves for a longer period than any other make of Trap in similar service.

The float has a straight, direct pull on each valve to open it by means of the levers. Pressure within the Trap holds each valve tight against the seat, resisting the buoyancy of the float, until being partially submerged by the rising water, the buoyancy of the float is increased sufficiently to overcome the resistance of the pressure against the valve—and open it. The instant the valve leaves the seat, the resistance on the float is released so that it rises slightly higher in the water, thus instantly opening the valve full width, without throttling effect or cutting.



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

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

On extremely light service where there is not enough condensation to keep one valve open all the time, the valve will open and shut alternately, dis-

charging 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.

DEEP WATER SEAL

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

ACCESSIBILITY

The inside parts are all attached to the cover and may be removed intact to the workbench or to some other 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. (See illustrations on pages 4 and 17).

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; they may be removed with an ordinary screw driver.

NON-AIR BINDING FEATURE

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

When draining heating systems, blast coils, or receptacles which fill with air when idle, it is advisable to use an air vent on or near the trap to facilitate quick elimination of the accumulated air from the system.

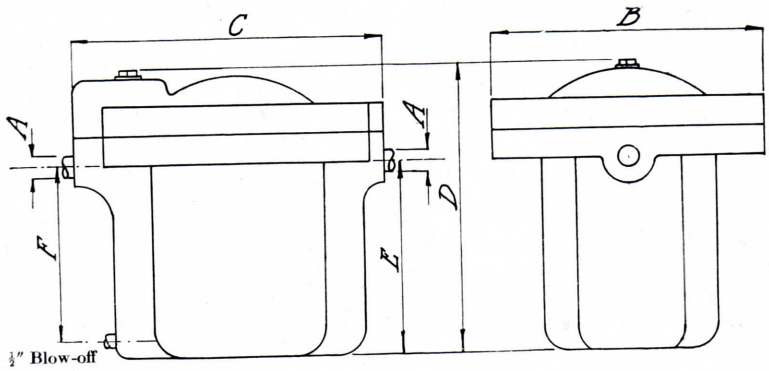
FOR COMPRESSED AIR

The "Emergency" Trap is used very successfully for draining condensation from compressed air receivers, separators, etc. See page 11 for detailed account of this service.

Whether on steam separators, heating coils, drying systems, cooking apparatus, stills or evaporators, the "Emergency" three valve Trap is 100% efficient. By continuously removing all condensation, steam is maintained at its highest temperature and the apparatus at top heat.

The one best way to tell what the Wright-Austin "Emergency" three valve Trap will do in your plant is to install it alongside of any other type in service and watch results.

DIMENSIONS OF WRIGHT-AUSTIN "EMERGENCY" HIGH PRESSURE STEAM TRAPS



Dimensions in Inches

Size No. of Trap	A Pipe Size of Inlet and Outlet	B Diameter of Cover	C Overall Distance from Inlet to Outlet	D Height from Base to Top	E Height from Base to Connections	F Center of Blow-Off to Center of Outlet
30	½	7¾	9½	9⅝	6	4¾
31	¾	7¾	9½	9⅝	6	4¾
32	1	9	11¼	11⅞	7¾	6½
33	1¼	10	12	12⅝	8¾	7¼
34	1½	11¼	12¾	13⅜	9	8
35	2	11¾	13¾	13⅝	9⅜	8¼
36	2	12¾	15¼	14⅝	10⅛	9
37	2½	14¼	16½	16¼	10¾	10
38	2½	15⅛	18	17¾	11½	10
39	3	16½	19½	19	12¼	10¾

Note—On traps No. 30 to 36 inclusive, openings (ordinarily closed with plugs) suitable for water gauge, are placed on body of Trap so that cover and all internal parts can be removed without disturbing water gauge.

USE OF TABLES

Example: 150 feet of 4″ covered pipe leads from a boiler delivering steam, containing 2½% moisture, to a steam separator, and thence to an engine. The steam pressure is 150 lbs. per square inch and the velocity in the piping is 8000 feet per minute.

Wanted, the size of Trap to use for draining the separator.

Enter table No. IV on page 22, under headings 4″ pipe and 150 lbs. pressure. Condensation lost per hour is 17 lbs. This times 1.5=26 lbs. Set this aside.

Enter table No. VI on page 23, under heading 4″ pipe and 150 lbs. pressure. The condensation per hour is 390 lbs.

Add the first and second quantities together and multiply by factor of safety 5, to allow for slugs of water.

With the resultant figure 2080 enter the table on page 9 under 150 lbs. and read the nearest trap size, which is ¾″.

This is the Trap that should be used with the separator.

LIST PRICES AND WEIGHTS OF "EMERGENCY" HIGH PRESSURE STEAM TRAPS

Size No.	Pipe Size of Inlet and Outlet	Net Weight Pounds	Boxed for Export		List Price *	Code Word
			Gross Weight Pounds	Contents of Package Cu. Ft.		
30	½″	35	55	1.5	$27.00	Faced
31	¾″	35	55	1.5	28.00	Fagot
32	1″	70	90	2.0	39.00	Fatal
33	1¼″	85	110	2.5	47.00	Flink
34	1½″	100	125	3.0	60.00	Feign
35	2″	110	135	3.2	80.00	Fichu
36	2″	135	165	3.6	100.00	Fidge
37	2½″	190	225	4.6	130.00	Firtz
38	2½″	235	275	5.3	160.00	Flord
39	3″	285	330	5.8	180.00	Flake

*Price includes Air Vent.

Water Gauge, suitable for all sizes, List $2.70—Code Word, "Fauge." Water Gauges are not furnished unless specified.

Note—Every Trap is carefully tested before shipment and fully guaranteed.

Read pages 1, 2, and 3, before selecting a Trap.

CAPACITY OF "EMERGENCY" HIGH PRESSURE STEAM TRAPS AT VARIOUS PRESSURES

Size No.	Pipe Size of Inlet and Outlet	Maximum discharge in pounds of water per hour at pressures of:										
		10 Lbs.	20 Lbs.	30 Lbs.	40 Lbs.	50 Lbs.	75 Lbs.	100 Lbs.	125 Lbs.	150 Lbs.	175 Lbs.	200 Lbs.
30	½″	900	1160	1400	1560	1750	2000	2100	2200	2300	2400	2500
31	¾″	900	1160	1400	1560	1750	2000	2100	2200	2300	2400	2500
32	1″	2000	2500	2900	3200	3500	4000	4400	4700	4900	5100	5300
33	1¼″	2400	3200	3700	4200	4500	5100	5600	6000	6300	6700	7000
34	1½″	3100	4050	4800	5300	5700	6400	7100	7600	8100	8600	9000
35	2″	4000	5960	7000	7800	8400	9500	10400	11200	12000	12800	13700
36	2″	5500	7800	9300	10500	11300	13100	14400	15600	16700	17800	19000
37	2½″	7000	10300	12400	13800	15000	17400	19200	20800	22400	23900	25500
38	2½″	11500	16500	20200	22600	24900	29200	32500	35300	38000	40700	43500
39	3″	16100	22800	28000	31500	34800	41000	45900	49800	53700	57600	61500

For notes on the best method of installing "Emergency" Traps, see page 17.

RELATIONSHIP OF PIPE SIZE AND CAPACITY

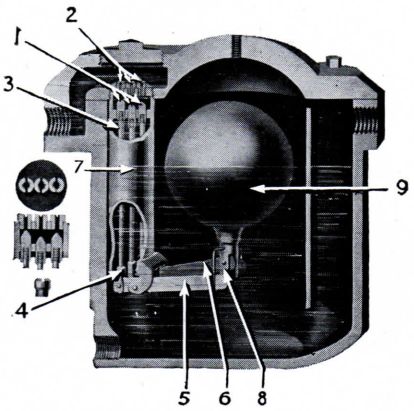
The Wright-Austin Company continually seeks to meet actual conditions by adapting its product, from time to time, to practical power plant needs.

The No. 30 Series of "Emergency" Traps, illustrated in this catalogue was developed to meet power plant requirements more exactly than the 1 to 8 Series of "Emergency" Traps which was standard for many years and illustrated in previous catalogues.

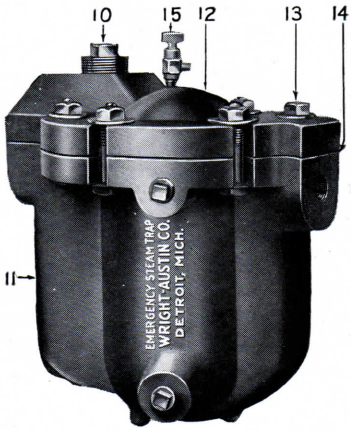
The No. 30 Series is designed so that the cost of a Trap for a given service is made as low as possible, while at the same time the generous proportions which have always been a characteristic of Wright-Austin Traps are carefully preserved. The whole Series of "Emergency" Traps is thus designed in the interest of the user, and in accordance with a well established policy of continuous progress.

Parts for the 1 to 8 Series are carried in stock at all times.

PARTS FOR "EMERGENCY" HIGH PRESSURE TRAP

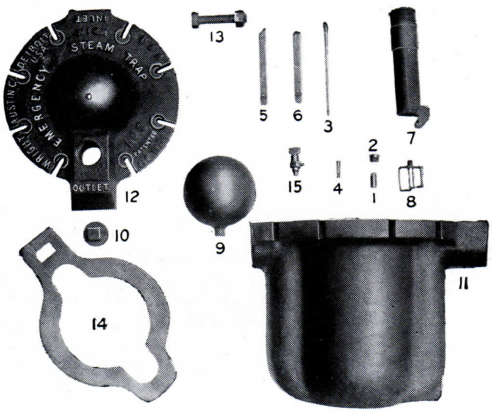


Nine Interior Parts

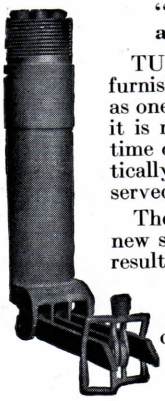


Six Exterior Parts

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



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



"Emergency" Traps need never be discarded, as any and all parts are interchangeable and renewable.

TUBE ASSEMBLY as shown at left, comprising parts one to eight, can be furnished factory assembled and adjusted, ready to put in service by attaching as one unit to cover and float. When more than two or three parts are desired, it is recommended the complete tube assembly be obtained. This saves the time of putting together and adjusting the parts and also makes a Trap practically as good as new. Whatever is good of the parts removed may be preserved as spares.

The valves and seats should always be replaced in pairs or complete sets. A new seat on an old valve or vice versa is unlikely to be a perfect fit, and will result in soon wearing the new part.

Separate parts can be furnished if desired.

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

In ordering be sure to give NAME and NUMBER of part, and SIZE NUMBER of Trap cast on cover.

"EMERGENCY" TRAPS FOR COMPRESSED AIR SERVICE

The Wright-Austin "Emergency" High Pressure Steam Trap has an unusually wide field of usefulness with compressed air.

Steam is a gas—so is air; steam is under high pressure and this is true of compressed air also; condensation occurs in both types of service, but the two services differ in some very important particulars and it is in caring for these particular features that the Wright-Austin "Emergency" excels all others.

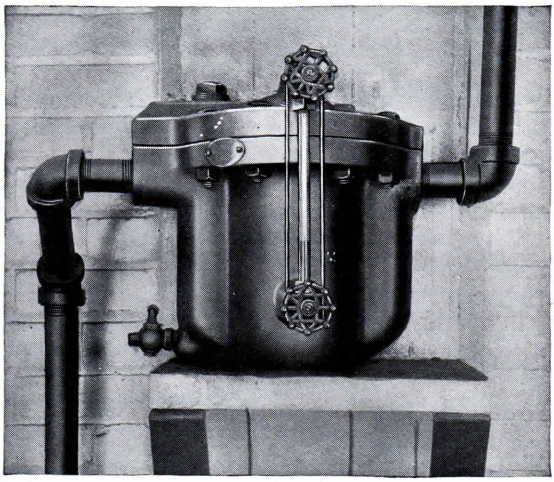
Air lines must be kept tight or the waste measured in money is prohibitive. The "Emergency" Trap fills this requirement completely. It will stay tightly sealed when it is perfectly empty of water, whereas most Traps blow air out to the atmosphere until enough water has accumulated to form a water seal. This is a tremendous waste of valuable compressed air which the "Emergency" Trap prevents. This condition of an empty Trap is likely to occur frequently, but no air will be lost if an "Emergency" Trap is installed.

The Monel Metal valves and seats are tight and stay tight. This is described in detail on page 6 under heading "Operation."

Another way in which air lines require special consideration is in the matter of slugs of water. In the winter time when a plant is shut down for the night condensation may develop in the air lines to such an extent that considerable bodies of water will be present if it is not drained away. When the air lines are opened up for service, slugs of water start traveling through the pipes causing all sorts of unsatisfactory conditions. In addition water in cold air lines sometimes freezes and makes a great deal of trouble, and even the tools operated by compressed air may freeze and become inoperative.

The three valve construction of the "Emergency" Trap not only drains away condensation as it is formed, but takes care of slugs of water which may come traveling through the pipes due to condensation at low points. The combination of a small valve opening for light loads and a very large valve opening when slugs of water appear, is described fully on page 5, and is one of the unique features of the "Emergency" Trap. The Trap takes care of these slugs of water without the reciprocal effect of wire drawing or chattering at light loads.

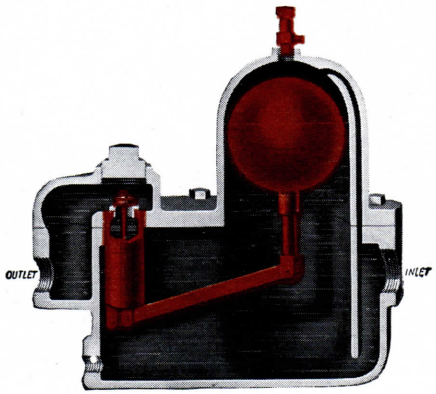
The "Emergency" Trap has been in use on air lines for many years, and there are hundreds of installations giving effective service in all parts of the United States. Its upkeep on air service is practically negligible.



Wright-Austin "Emergency" High Pressure Trap, on Drain from Compressed Air Receiver Tank, at McGraw Ave. Plant of Kelsey Wheel Co., Detroit, Mich. Air Pressure 125 Lbs.

THE WRIGHT-AUSTIN "VICTOR" LOW PRESSURE STEAM TRAP

(For Pressures from 0 to 20 Lbs.)



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

DEPENDABILITY

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

LARGE CAPACITY

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

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

Incidentally, we recommend most strongly that Traps be selected on the basis of capacity in pounds of water per hour, not on the basis of pipe size; see pages 1 and 15.

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.

DEEP WATER SEAL

Carrying a deep water seal of several inches, completely submerges the outlet tube and absolutely prevents escape or waste of any steam. See water level in cut on page 12.

CONSTRUCTION

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

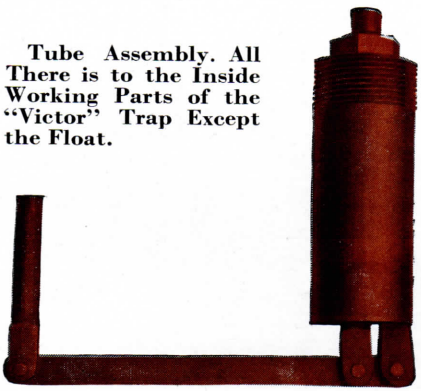
The valve and seat are located directly under the test plug, in the cover, and may be removed after unscrewing the plug, without disturbing the rest of the cover. These two strong features alone reduce the bother and cost of Trap maintenance, very greatly.

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.

VACUUM SERVICE

The "Victor" Trap is admirably adapted for use on vacuum return lines. It should be installed ahead of the vacuum pump, and when used for this service, a small equalizing pipe should be connected from the dome of the Trap to an opening tapped in the plug, over the valve of the Trap, or in the discharge pipe. See photograph on back cover.



Tube Assembly. All There is to the Inside Working Parts of the "Victor" Trap Except the Float.

WATER REGULATOR

For a low pressure water regulator the operation of the Trap is reversed. It is changed so that the float closes the valve, as the water in the Trap rises to a pre-determined level. The Trap is installed so that the water level inside it shall correspond to the water level desired in the receptacle to which it is connected.

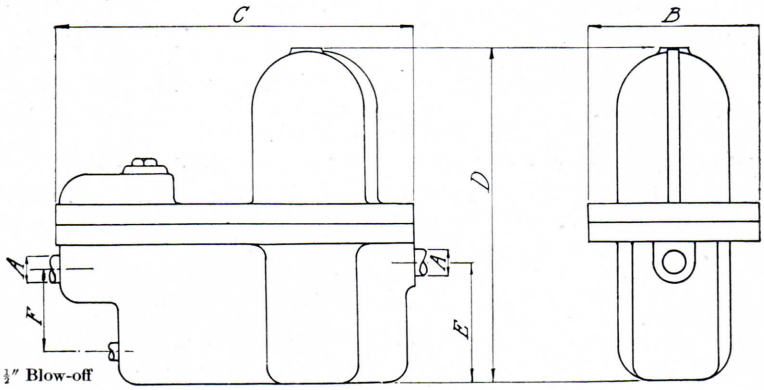
FOR DRAINING OIL SEPARATORS

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

FOR GASOLINE SERVICE

The "Victor" Trap is used with conspicuous success when liquid gasoline is to be removed from gasoline gas. The light weight of the moving parts and the small pressure needed to operate the Trap removes the condensed gasoline easily. The liquid seal of the Trap prevents the escape of the higher volatiles.

DIMENSIONS OF WRIGHT-AUSTIN "VICTOR" LOW PRESSURE STEAM TRAPS



Dimensions in Inches

Size No. of Trap	A Pipe Size of Inlet and Outlet	B Width	C Overall Distance from Inlet to Outlet	D Height from Base to Top	E Height from Base to Connections	F Center of Blow-Off to Center of Outlet
40	½	6½	9⅝	9¼	4	3
41	¾	6½	9⅝	9¼	4	3
42	1	7¾	12¾	11¾	5	4⅛
43	1¼	8½	13¾	12¾	5⅛	4⅛
44	1½	9½	15¾	14½	5½	4⅛
45	2	10¼	17⅞	15¼	5½	4⅜
46	2	11	19¾	17¾	6⅜	5⅛
47	2½	12¾	21¾	19½	6½	5¼
48	3	14	23¼	21¼	7¾	6⅞
49	3	14	24	23¼	8½	7

ENGINEERING SERVICE

The Wright-Austin Company is always willing to answer questions, furnish information, or give engineering advice on the selection and installation of its products.

This Bulletin contains information required for selecting apparatus to meet ordinary conditions, and we believe the data and suggestions contained will be found sufficient to cover most installations; but when extraordinary conditions arise, or when there is doubt about the selection of equipment, the Wright-Austin Engineering Service will be found invaluable. Wright-Austin Engineers are drainage experts, and frequently plan entire drainage systems for prospective customers, or for manufacturers of heating and drying machinery.

Engineers and Managers should feel free to call upon this Service at any time. It will be cheerfully rendered, and there will thus be made available to them the accumulated experience of nearly thirty years of successful production.

LIST PRICES AND WEIGHTS OF "VICTOR" LOW PRESSURE STEAM TRAPS

Size No.	Pipe Size of Inlet and Outlet	Net Weight Pounds	Boxed for Export		List Price *	Code Word
			Gross Weight Pounds	Contents of Package Cu. Ft.		
40	½″	35	55	1.5	$27.00	Kayak
41	¾″	35	55	1.5	28.00	Keyrt
42	1″	50	70	2.0	39.00	Kirni
43	1¼″	60	85	2.5	47.00	Kotto
44	1½″	75	105	3.0	60.00	Kreut
45	2″	90	120	3.5	80.00	Kymog
46	2″	120	155	4.6	100.00	Krypt
47	2½″	170	210	5.3	130.00	Kuklu
48	3″	200	245	6.2	160.00	Kagol
49	3″	220	275	8.3	180.00	Klapt

*Price includes Air Vent.

Water Gauge, suitable for all sizes. List $2.70—Code Word, "Fauge." Water Gauges are not furnished unless specified.

Note—Every trap carefully tested before shipment and fully guaranteed.

Read Pages 1, 2, and 3 before selecting a Trap

Select the Size of Your Trap on Capacity Basis Not by Pipe Size

CAPACITY OF "VICTOR" LOW PRESSURE STEAM TRAPS AT VARIOUS PRESSURES

Size No.	Pipe Size of Inlet and Outlet	Maximum discharge in pounds of water per hour at pressures of:								
		1 Lb.	3 Lbs.	5 Lbs.	7 Lbs.	10 Lbs.	12 Lbs.	15 Lbs.	18 Lbs.	20 Lbs.
40	½″	1125	1945	2500	2925	3540	3825	4340	4770	5015
41	¾″	1125	1945	2500	2925	3540	3825	4340	4770	5015
42	1″	2020	3495	4500	5250	6360	6865	7795	8565	9000
43	1¼″	3040	5260	6770	7900	9575	10335	11735	12890	13555
44	1½″	3700	6400	8250	9620	11650	12580	14280	15690	16500
45	2″	6880	11900	15340	17885	21670	23390	26555	29170	30685
46	2″	9550	16520	21290	24830	30080	32470	36860	40490	42590
47	2½″	11400	19720	25420	29640	35910	38760	44000	48335	50845
48	3″	14580	25220	32510	37900	45920	49570	56275	61820	65025
49	3″	19920	34460	44420	51790	62745	67725	76890	84460	88840

For notes on the best method of installing "Victor" Traps, see page 17.

RELATIONSHIP OF PIPE SIZE AND CAPACITY

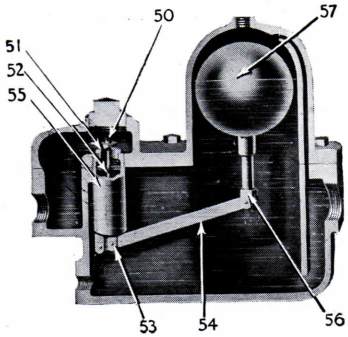
The Wright-Austin Company continually seeks to meet actual conditions by adapting its product, from time to time, to practical power plant needs.

The No. 40 Series of "Victor" Traps, illustrated in this catalogue, was developed to meet the requirements of the heating system and other low pressure work more exactly than the 1 to 8, No. 10 or No. 20 Series of "Victor" and "Special" Traps, which were standard for many years and illustrated in previous catalogues. The No. 40 Series takes the place of the 1 to 8, No. 10 and No. 20 Series.

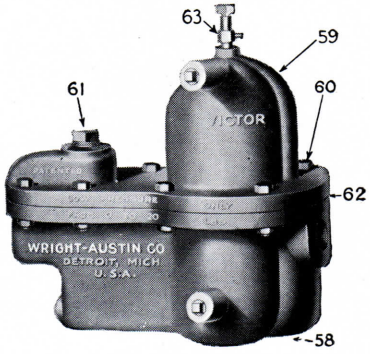
The No. 40 Series is designed so that the cost of a Trap for a given service is made as low as possible, while at the same time the generous proportions which have always been a characteristic of Wright-Austin Traps are carefully preserved. The whole Series of "Victor" Traps is thus designed in the interest of the user, and in accordance with a well established policy of continuous progress.

Parts for the 1 to 8, No. 10 and No. 20 Series are carried in stock at all times.

PARTS FOR "VICTOR" LOW PRESSURE TRAP

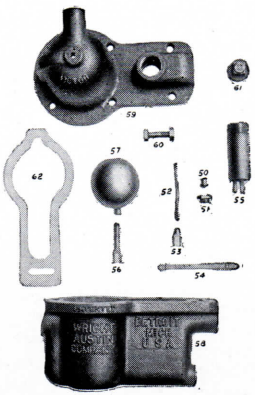


Eight Interior Parts



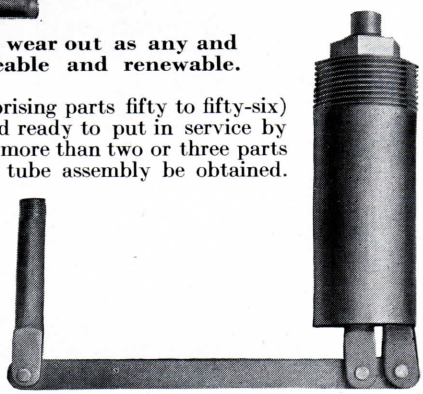
Six Exterior Parts

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



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

"Victor" Traps need never wear out as any and all parts are interchangeable and renewable.



TUBE ASSEMBLY as shown at right (comprising parts fifty to fifty-six) can be furnished factory assembled and adjusted ready to put in service by attaching as one unit to cover and float. When more than two or three parts are desired, it is recommended the complete tube assembly be obtained. This saves the time of putting together and adjusting the parts and also makes your trap practically as good as new. Whatever is good of the parts removed may be preserved as spares.

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

Separate parts can be furnished if desired.

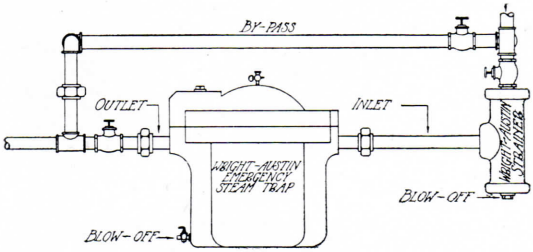
Parts for former Trap Series No. 1 to 8, No. 10 to 18 and No. 20 to 28 inclusive, now discontinued, can be furnished as usual.

In ordering be sure to give NAME and NUMBER of part, and SIZE NUMBER of Trap cast on cover.

INSTALLATION

Always place a Steam Trap in an accessible location, and at the lowest point to be drained.

Every Trap should be provided with shut-off valves, as well as with a by-pass, as shown below. This permits inspection, repair or removal of the Trap without interrupting the continuous drainage of condensation. A blow-off connection is, of course, absolutely essential. A water gauge is also recommended. Typical installations for "Emergency" and "Victor" Traps are illustrated on this page.



Correct Installation of "Emergency" High Pressure Steam Trap

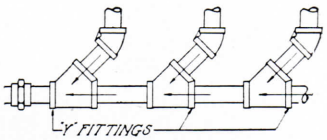
When steam is first turned on, be sure to leave the valve on the blow-off connection open for several minutes, to thoroughly clean out all pipe lines. This is very important, especially on new pipe lines, which invariably contain a large amount of dirt and grit. This also serves to heat up the Trap before putting it into service.

Under normal operation, the water level in the "Emergency" Trap gets no lower than about half full, while in the "Victor" Trap the normal low water level is about two-thirds full. This forms a deep water-seal over the lower end of the discharge tube so that steam cannot reach the valves or escape.

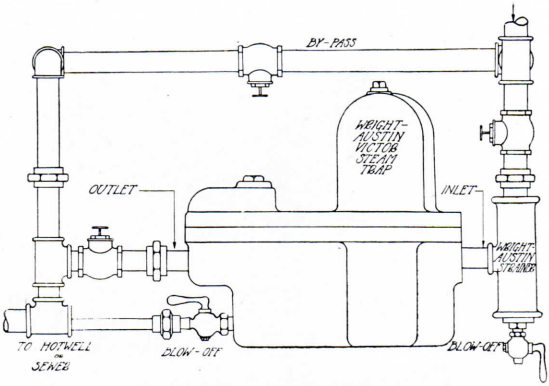
The air vent valve, in the top of the Trap cover, should be slightly open at all times, to eliminate the excess air from the system while in operation. Every Steam Trap should be blown off daily or oftener. A Strainer should be installed ahead of every Steam Trap, except Traps used to eliminate oil and grease. It will prevent 90% of all Trap troubles; see page 20. The following simple test of a Wright-Austin Trap can be made in a few seconds:

First close the valves on both the inlet and discharge lines of the Trap to shut off the pressure. Then partially open the blow-off valve until water is all blown out and keep it open just enough to carry away the condensation as fast as it enters, so it cannot accumulate in the Trap.

Next remove the test plug in the cover of the Trap. Then turn on full steam pressure by opening the valve on the inlet pipe. Should any steam be escaping through the Trap valve, it can be detected instantly at the opening where the test plug has been removed.



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



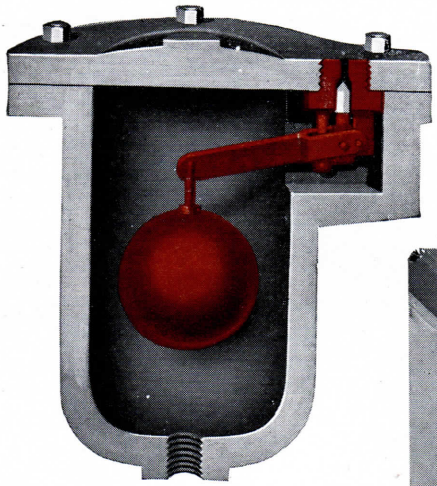
Correct Installation of "Victor" Low Pressure Steam Trap

Condensation discharged from a Trap is sometimes mistaken for steam, especially in cold weather and the Trap is then thought to be leaking. The reason for this is that the condensation is instantly reevaporated when striking the air because of its high temperature. In making the above test one should make certain that it is steam which is escaping, before deciding that the Trap valves are leaking.

Steam has a bluish tint, while reevaporated condensation is white. This difference may be observed by opening the trycocks on a boiler, above and below the water level.

Automatic Air Eliminators

WRIGHT-AUSTIN AIR TRAP



Suitable for Removing Air from Water or Other Liquid Under Pressure.

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

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

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

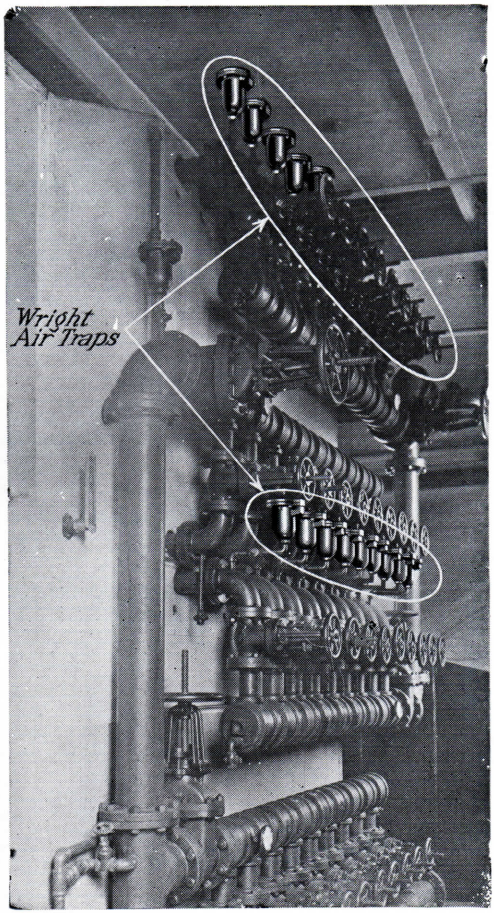
Dimensions in Inches

Size of Connections	Diameter	Hgt.	Wgt. Lbs.	List Price	Code Word
¾	6	7	15	$13.00	Urabe

Trap can be furnished tapped for ½" connection if desired, without extra charge.

Code Word, Ukuse.

Whistle $1.75 additional.



Air Traps on Oil Piping Feeding Oil Quenchers

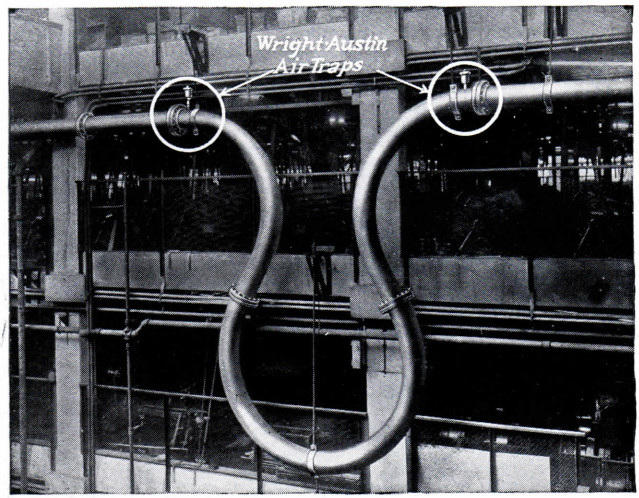
WRIGHT-AUSTIN THERMOSTATIC AIR VALVE

This valve is of the expansion type and suitable for steam pressures up to 30 pounds. It is designed to permit the escape of air, until closed by the high temperature of steam entering the brass tube. Except for the rods, the entire valve is brass, with ample length to provide full valve opening. The valve opening may be adjusted and locked by a thumb nut.

There is nothing to crystallize or wear out, and it will give a lifetime of excellent service on traps, heating mains, receivers, etc.

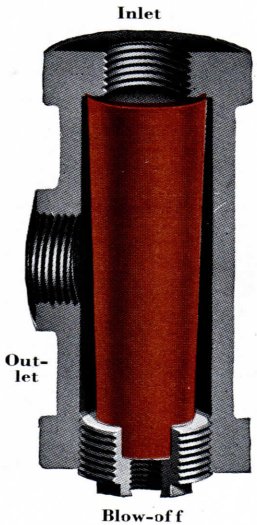
Made with ⅛-inch pipe threads.
Length, 11¼ inches.
Weight, 1 pound.
List price, $3.00.
Code word, Urgeb.

The Air Valve illustrated here removes air from steam. The Air Trap described on page 18 removes air from liquids. Thus the whole field is covered.



Air Traps in Use on Hot Water Heating System in Plant of Ford Motor Company, Detroit

The Wright-Austin Strainer for Steam, Air, Gas, Oil or Water



Stops all foreign matter, scale, packing, etc., in pipe lines from getting into Steam Traps, Pressure Reducing Valves, Oil Burners, Pumps, Heating Systems and many other devices.

By removing the gritty substances, it takes the teeth out of the steam and water that constantly gnaws away and cuts out Trap Valves, Reducing Valves, etc. Nine-tenths of all Trap ills are caused by scaly grit passing into the Traps and this can positively be prevented by the WRIGHT-AUSTIN Strainer, thus eliminating the greatest source of Trap trouble.

The Strainer should be placed in the inlet pipe to every Steam Trap and Reducing Valve. It is just as effective on vacuum returns, pump suctions and water supply lines.

There is no friction loss in this Strainer, as the collective area of the small holes through the large basket screen is many times greater than the area of the pipe connection, and a glance at the table shows the liberal dimensions of this strainer.

The Screen is made from finely perforated sheet brass and will never rust out.

The Strainer has top inlet and side outlet, thereby collecting all foreign matter on the inside of the screen.

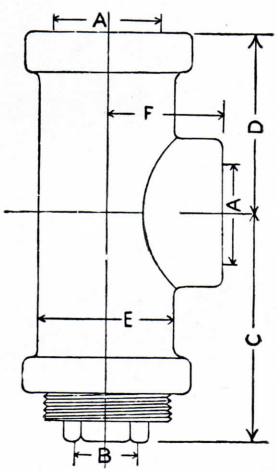
As the illustration shows, the screen is cone shape, which makes the Strainer self-cleaning when blown off at the bottom under pressure, as it thoroughly scrubs the inside of the screen clean of all debris. It is all done in an instant by using a simple blow-off valve screwed into the bottom of the plug. Or, the screen may be removed by simply unscrewing the plug to which it is attached, the dirt shaken out and screen replaced.

The Strainer is as easy to install as an ordinary ell in the pipe line. It is simple, practical, durable, and there is nothing to get out of order. The price is very reasonable, and it will pay for itself in a short time.

If desired one will be sent on approval.

DIMENSIONS AND PRICE LIST
All Dimensions in Inches

Size No.	Inlet Outlet A	B	C	D	E	F	Wgt. Lbs.	List Price	Code Word
1	1/2	1/2	3 3/4	3	2 5/8	2	7	$4.00	Twine
2	3/4	1/2	3 3/4	3	2 5/8	2	7	4.00	Topon
3	1	1/2	3 3/4	3	2 5/8	2	7	4.00	Tefom
4	1 1/4	1/2	3 3/4	3	2 5/8	2	7	5.00	Tabin
5	1 1/2	1/2	4 1/4	3 1/2	2 5/8	2	12	8.00	Tilew
6	2	3/4	5 1/4	4 3/8	4 1/8	2 7/8	20	11.00	Tharp
7	2 1/2	3/4	6 1/4	5	4 1/8	3 1/8	28	15.00	Trime
8	3	3/4	7 1/2	6	6	3 5/8	50	19.00	Tweed
9	4	3/4	9 1/4	7 3/4	7 5/8	5	100	30.00	Tulip
9F	4	1	8 7/8	7 1/2	7 1/2	6 3/8	150	40.00	Trick



No. 9F has flanged connections faced and drilled to A. S. M. E. Extra Heavy Schedule.

Suitable for all pressures up to 250 lbs.

Standard screens 400 holes per square inch. Any mesh screen can be made on special order.

Steel screens suitable for use with ammonia can be provided when desired.

Tables

TABLE I

Table for Converting Square Feet to Lineal Feet for Different Sizes of Pipe

One square foot of radiating surface equals:

3.63	Lineal	feet	of	¾″	Pipe
2.90	"	"	"	1″	"
2.30	"	"	"	1¼″	"
2.01	"	"	"	1½″	"
1.608	"	"	"	2″	"
1.329	"	"	"	2½″	"
1.090	"	"	"	3″	"
0.955	"	"	"	3½″	"
0.848	"	"	"	4″	"
0.763	"	"	"	4½″	"
0.685	"	"	"	5″	"
0.576	"	"	"	6″	"
0.501	"	"	"	7″	"
0.442	"	"	"	8″	"
0.397	"	"	"	9″	"
0.355	"	"	"	10″	"

TABLE II

Comparative Carrying Capacities of Different Sizes of Pipe

EXAMPLE: To get size pipe to serve a 1″ pipe and a 1¼″ pipe
1″ equals 10
1¼″ equals 20
30 equals 1½″ pipe

Dia. Pipe	Capacity Factor
½″	2
¾″	5
1″	10
1¼″	20
1½″	30
2″	60
2½″	110
3″	175
3½″	260
4″	380
5″	650
6″	1050
7″	1600
8″	2250

TABLE III

Standard Dimensions of Wrought-Iron Welded Pipe

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

From Standard Authorities—Not Guaranteed

TABLE IV

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

This table and the one immediately below have been computed from tables of heat loss in covered and uncovered pipe at room temperature, given in the 1923 edition of Kent's Mechanical Handbook, pages 634 and 638.

The table for covered pipe has been corrected for heat loss due to friction, the velocity of the steam being taken at 8000 feet per minute, and the loss being figured for three-inch diameter pipe and over. The formula used was that given in the 1905 edition of Kent, page 671.

The table for uncovered pipe has not been corrected for friction losses, because the loss due to friction, at steam velocities ordinarily used in uncovered pipe, is a negligible percentage of the loss due to radiation.

TABLE V

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

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	11	15	21	24	30	**38**	46	55	61	85	102	120
2	13	15	21	25	31	**39**	47	56	62	86	104	123
3	13	16	21	25	31	**40**	47	57	64	88	106	125
4	14	16	22	26	32	**40**	48	59	66	89	108	127
6	14	16	23	27	33	**41**	49	60	69	92	111	132
8	15	17	23	27	34	**43**	51	62	72	95	115	136
10	15	18	24	29	36	**44**	53	64	75	97	117	141
20	16	20	28	33	41	**50**	61	74	89	112	135	161
30	18	23	33	38	46	**56**	68	83	101	125	152	181
40	20	25	36	42	51	**61**	76	91	112	138	169	200
50	22	27	39	46	55	**66**	83	100	121	150	186	221
60	23	29	41	51	59	**71**	90	107	129	165	202	238
70	25	31	44	53	63	**75**	96	115	137	174	217	256
80	27	32	46	56	67	**80**	101	121	144	185	229	270
90	28	34	48	59	70	**83**	106	127	150	194	240	283
100	29	35	50	61	73	**86**	111	132	158	202	250	297
125	32	39	55	68	81	**94**	123	146	174	224	278	330
150	35	42	60	74	88	**103**	133	159	188	244	301	359
175	38	46	64	78	93	**111**	143	171	202	261	324	389
200	40	49	69	81	97	**119**	150	181	217	276	347	417

*Figures in bold face type in column headed 3 inches may be used for the condensation in 100 square feet of radiating surface.

From Standard Authorities—Not Guaranteed.

TABLE VI

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 Moisture is Given in Pounds of Condensation per Hour

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—Not Guaranteed

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.**

USE OF TABLES

Table IV, applying to condensation in covered pipe, and Table VI, applying to moisture brought over with steam, are primarily for high pressure, power piping, involving the use of Wright-Austin "Emergency" Traps. Table V, applying to condensation in uncovered pipe, is primarily for heating and other low pressure work involving the use of the Wright-Austin "Victor" Trap.

To determine the size of trap needed to handle condensation for a section of power piping, enter Table IV under the proper pipe size and pressure and multiply the condensation given, by the number of hundreds of feet of pipe. Set this quantity aside, and, as a separate operation, enter Table VI under the proper pipe size and pressure to find the condensation due to moisture. Under normal conditions no correction should be made to the amount of condensation given in the table, but if the velocity of steam and percentage of moisture is known **BY TEST** to be different from 8000 ft. per minute, and 2½% respectively, correction can be applied in accordance with the note under Table VI.

Add the figures obtained from Tables IV and VI and multiply by **FIVE.** With the resultant figure, enter the table of Trap Capacities on page 9 (or in rare cases of power plant piping, that on page 15) under the proper pressure, and from this read the size of trap suitable for draining the piping in question. This will also be the size of trap suitable for draining any separator or receiver which may be included in the piping.

In the case of radiation from bare piping, where slugs of water do not occur, enter Table V under the proper pipe size and pressure. Multiply the condensation by the number of hundreds of feet of pipe. The resultant figure should then be used to enter the table of Trap Capacities on page 15 (or in rare cases above 20-lb. pressure, that on page 9) under the proper pressure. The correct size of trap to use can then be read from the table.

In cases of radiation from flat surfaces, the size of trap needed can be obtained by using the figures in Table V under 3-in. pipe, as condensation from 100 sq. ft. of flat surface. Proceed as for pipe surface in making further calculations.

An example of figuring for power plant piping will be found on page 8.

TABLE VII

Decimal Equivalents

By 64's from 1/64 to 1 Inch

Fraction	Decimal	Fraction	Decimal	Fraction	Decimal	Fraction	Decimal
1/64	.015625	17/64	.265625	33/64	.515625	49/64	.765625
1/32	.031250	9/32	.281250	17/32	.531250	25/32	.781250
3/64	.046875	19/64	.296875	35/64	.546875	51/64	.796875
1/16	.062500	5/16	.312500	9/16	.562500	13/16	.812500
3/64	.078125	21/64	.328125	37/64	.578125	53/64	.828125
3/32	.093750	11/32	.343750	19/32	.593750	27/32	.843750
7/64	.109375	23/64	.359375	39/64	.609375	55/64	.859375
1/8	.125000	3/8	.375000	5/8	.625000	7/8	.875000
9/64	.140625	25/64	.390625	41/64	.640625	57/64	.890625
5/32	.156250	13/32	.406250	21/32	.656250	29/32	.906250
11/64	.171875	27/64	.421875	43/64	.671875	59/64	.921875
3/16	.187500	7/16	.437500	11/16	.687500	15/16	.937500
13/64	.203125	29/64	.453125	45/64	.703125	61/64	.953125
7/32	.218750	15/32	.468750	23/32	.718750	31/32	.968750
15/64	.234375	31/64	.484375	47/64	.734375	63/64	.984375
1/4	.250000	1/2	.500000	3/4	.750000	1	1.000000

MISCELLANEOUS

1 cu. ft. of water weighs 62.36 lbs. at 62° F. at sea level.

1 cu. ft. of water equals 7.48 U. S. gals.

1 cu. ft. steam weighs .063 lbs. at 10 lb. per sq. in gauge pressure; .153 lbs. at 50 lb. pressure. .262 lbs. at 100 lb. pressure; .471 lbs. at 200 lb. pressure.

1 lb. of condensation equals the loss of 946 B. T. U. at 10 lb. gauge pressure.

1 lb. of condensation equals the loss of 855 B. T. U. at 150 lb. gauge pressure.

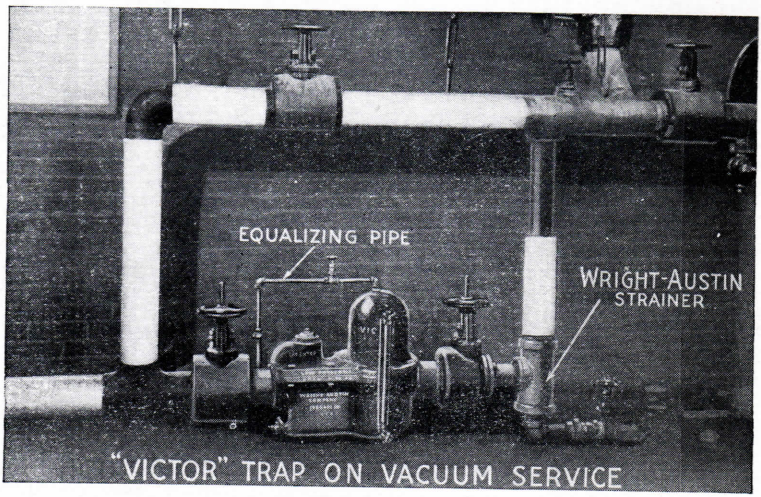
TABLE VIII

Areas of Circles

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

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

From Standard Authorities—Not Guaranteed



Vacuum return line, water sealed by 3-inch "Victor" Trap, installed ahead of pump in the large plant of the Hood Rubber Company, Watertown, Mass.

(See page 13 for notes on Vacuum Service.)