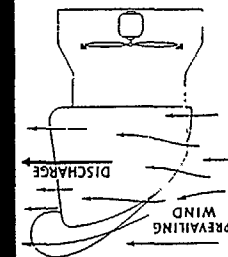


PLAINTIFF'S
EXHIBIT
USX-274

Use the Wind to Your
Advantage

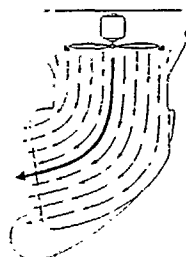


Outside wind currents assist the flow of air from the Airjector because the discharge is always with the wind. Rotary head revolves at spherical change of wind direction independent of fan operation. This climatic wind resistance—greatly increases fan efficiency and ventilator capacity. Permits use of lower H.P. motors, lowers operating cost.

Swartwout's highly efficient Rotary Head Bearing Ventilator forms the principal part of the Airjector. A special bearing housing the fan—correctly selected for each size Airjector. Fan and mounting are so designed that there is practically no obstruction to air flow when fan is not in operation.

You get more capacity per size in Swartwout Airjectors—reduce roof opening area—spend less for dead weight of metal. Write for complete catalog.

You Get Full Benefit
of Power



AIRJECTOR'S
Double Duty Capacity and
Correct Design PULL hot
air and gases through...
create better working con-
ditions, increase production

**Swartwout
AIRJECTOR**
Name Registered U.S. Patent Office

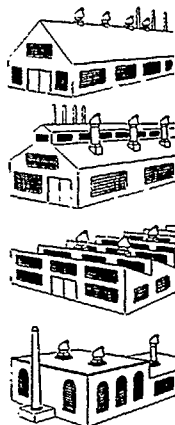
brings new efficiency
in power ventilating

If the type of your operations or the construction of your buildings requires power ventilation—whether industrial, commercial, schools, hotels, etc.—Swartwout Airjector gives you economy and efficiency combined with pleasing appearance.

It is especially adapted in industry for smoke and fume removal—on forge shops, galvanizing plants, over pickling tanks, in foundries, heat treating buildings, spray booths, welding shops, pump houses and similar locations.

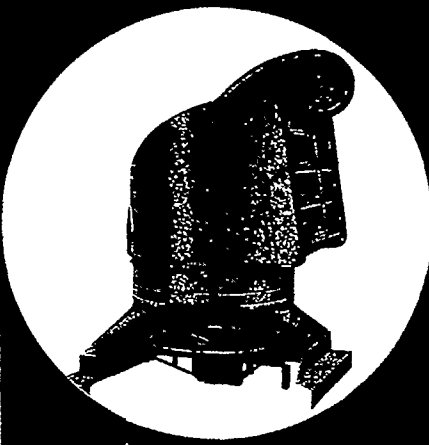
Swartwout engineers analyze your conditions without obligation—recommend the equipment best suited to give the most satisfactory results.

Write, wire or phone for complete information.



Positive Ventilation

USHO 003377

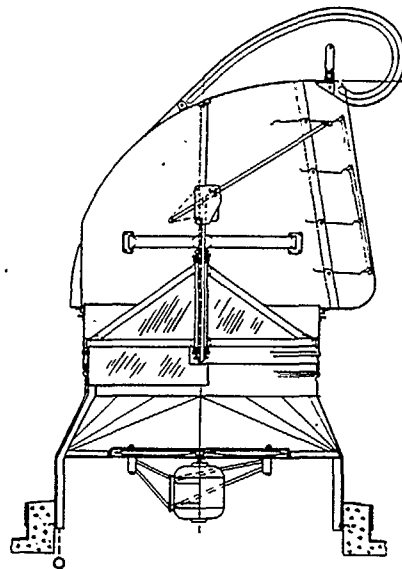


with the

THE SWARTWOUT CO. - CLEVELAND, OHIO

District Representative

THERE'S PROFIT FOR YOU IN
CONTROLLED AIR CIRCULATION



30 YEARS of Swartwout Engineering Development - Bring you these Features

ALL Swartwout Ventilators are carefully designed for lowest possible airflow friction—are sturdily constructed of high-grade materials for long life and trouble-free service.

Wind Vane—New low-slung design keeps overall height at a minimum. Enhances appearance, gives maximum stability. Sensitive to every wind variation.

Body—Modern curved design accelerates exhaust flow. Extra heavy materials for rigidity. Curved back reduces wind resistance—prevents accumulation of snow or ice.

Oversize Outlet—Extra large capacity outlet—30% extra area assists gravity circulation and suction "pull."

Louvers—Remote control adjustment does not conflict with fan operation. Can be locked open or shut.

Bearings—Stainless steel ball bearings, fully enclosed—dust-tight, corrosion-proof—permanently sealed, oilless.

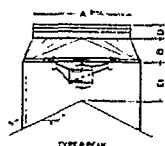
Flared Edges—Top and sides of outlet opening flared to divert wind currents and increase suction capacity.

Motor and Fan—Nationally known motors propel cast aluminum propellers of various styles—selective for type of ventilating job required. Ring mounting prevents back-flow of air.

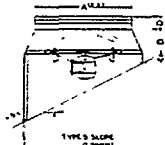
Swartwout Airjectors are guaranteed to deliver the c.f.m. capacity for which they are designed, when installed according to our analysis of your ventilating problem.

AIRJECTORS in Sizes and Capacities to Fit Your Needs

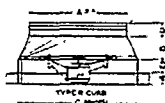
Three Types of Bases for AIRJECTORS



Type P—for Peak Roof



Type S—for Slope Roof



Type R For Curb Installation

These tables show sizes, capacities and dimensions of standard Airjectors covering a wide range of requirements. Quiet operating fans are recommended when minimum of noise is desired. Special Airjectors furnished if need is not met with a standard size. Acid and moisture resistant materials used when service requires. Write for complete details and tell us your problems.

Teardrop and "Birdwing" Fans Are Recommended for Quiet Operating

SINGLE PROPELLER FAN AIRJECTORS				
Airjector Number	Capacity	Speed	HP	Shipping Weight
16H16	1875	1725	1/20	149
20H20	2900	1725	1/20	188
24H24	4100	1725	1/4	205
24H24A	1400	1125	1/4	260
24H24B	3665	1725	1/4	260
30H26A	5850	1125	1/6	400
30H26B	6100	1125	1/6	400
30H26C	6875	1725	1/4	400
30H28	7200	1725	1/4	400
36H32	9295	1125	1/2	489
36H32A	14135	1725	1	535
42H36	11500	1125	1/2	745
42H36A	16500	1725	1	780
48H44	37550	1725	5	1071
54H49	47500	1725	5	1305
60H55	41500	1125	3	1523
60H55A	46500	1125	3	1565
60H55B	35000	1725	7 1/2	1785
72H55A	60000	1725	10	2160
"BIRDWING" PROPELLER FAN AIRJECTORS				
18Q17	2250	1725	1/20	162
18Q17A	2100	1125	1/20	167
18Q17B-3	2350	1725	1/10	165
Three Speeds	1900	1400		
	1150	1100		
20Q20	2950	1125	1/10	200
24Q24	4150	1125	1/6	255
24Q24A	3750	1725	1/2	255
30Q26	6900	1725	1/2	410
30Q28A	7800	1125	1/2	435
30Q28B-3	7500	1725	1/2	405
Three Speeds	6450	1400		
	5100	1100		

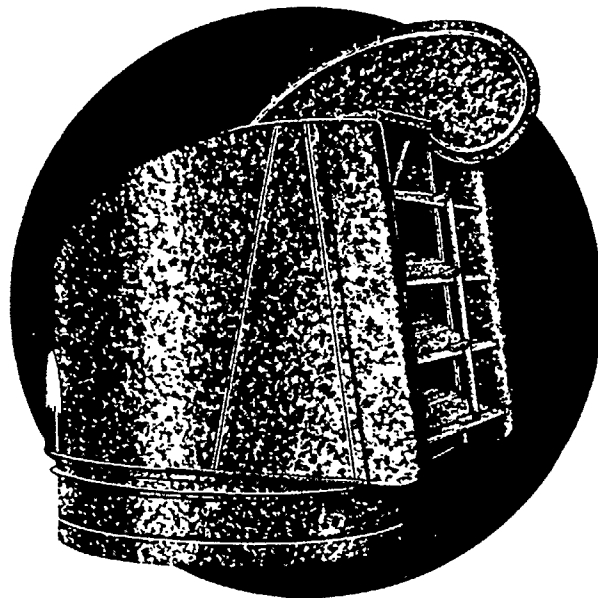
DOUBLE PROPELLER FAN AIRJECTORS				
Airjector Number	Capacity	Speed	HP	Shipping Weight
18H16-2A	2640	1725	1/10	185
20H20-2A	3350	1725	1/10	189
24H24-2	4730	1725	1/4	275
24H24-2A	6500	1725	1/4	285
30H28-2	8305	1125	1/2	425
30H28-2A	8655	1725	1/2	425
36H32-2	11500	1125	1	520
36H32-2A	14250	1125	1	590
36H32-2B	17050	1725	1	565
42H36-2	13350	1125	1 1/2	766
42H36-2A	14960	1725	1 1/2	788
42H36-2B	18100	1725	2	793
48H44-2	28270	1125	3	1012
48H44-2A	30500	1725	3	1025
54H44-2B	43500	1725	5 1/2	1310
60H55-2	39500	850	3	1365
66H49-2	56000	1725	10	1812
TEARDROP PROPELLER FAN AIRJECTORS				
12T12	1320	1725	1/20	119
16T16	2500	1725	1/20	188
20T20	3780	1725	1/20	233
24T24	5610	1725	1/4	260
24T24A	6160	1725	1/4	260
30T28	8140	1125	1/2	400
36T32-2*	10120	850	1	450
36T32	10400	1125	1 1/2	489
42T36-5	11770	850	1 1/2	765
42T36	15510	1125	1	745
42T36-3*	22000	850	2	915
42T40	23000	1125	2	945
48T44	29500	1125	3	1071
54T49	22000	850	1	1305
60T55	26500	850	2	1365
* Two Propeller Fan				

USHO 003378



Controlled **AIR CIRCULATION**

for INDUSTRIAL and COMMERCIAL BUILDINGS



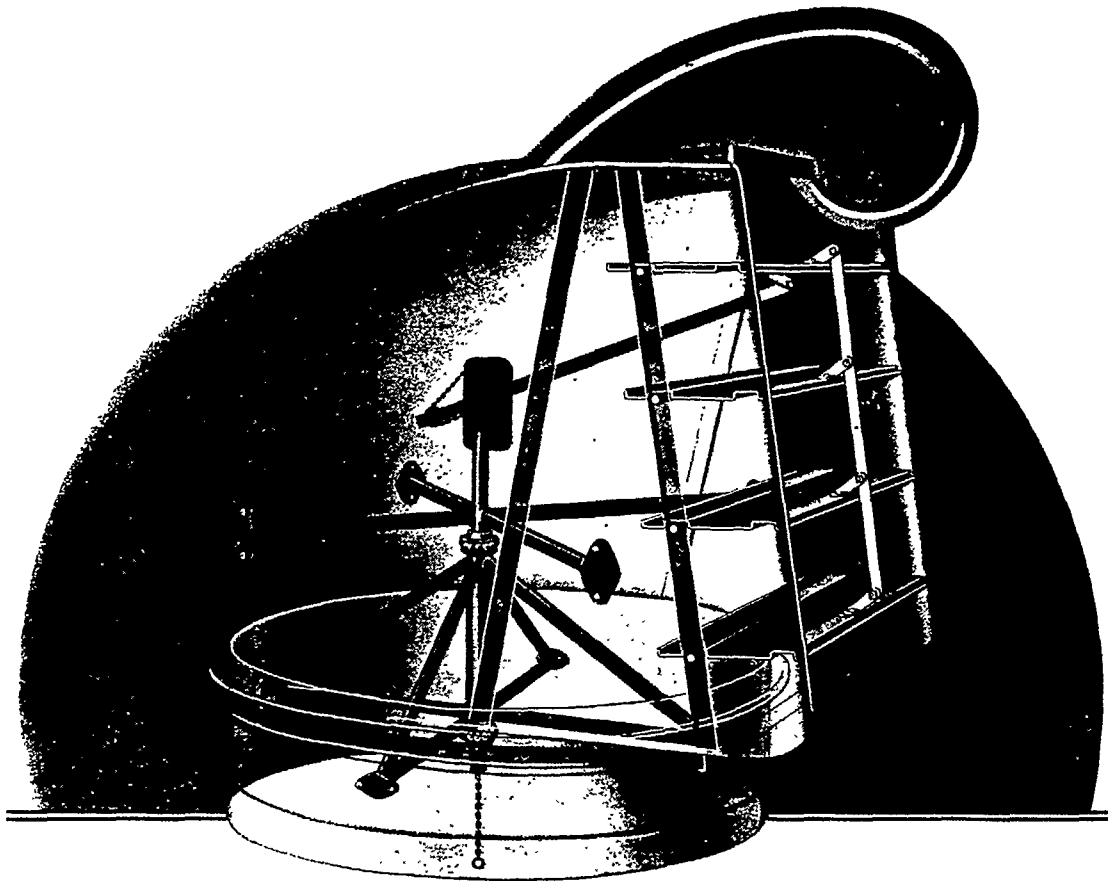
With the
Swartwout
ROTARY
BALL BEARING
VENTILATOR

Catalog Section B
BULLETIN No. 205

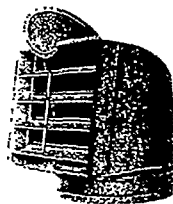
.....THE SWARTWOUT COMPANY.....CLEVELAND·OHIO.....

USHO 003379

THE SWARTWOUT ROTARY BALL BEARING VENTILATOR



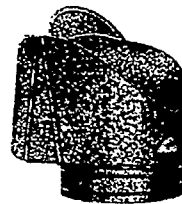
SIDE VIEW



3, FRONT VIEW



FRONT VIEW



1, REAR VIEW

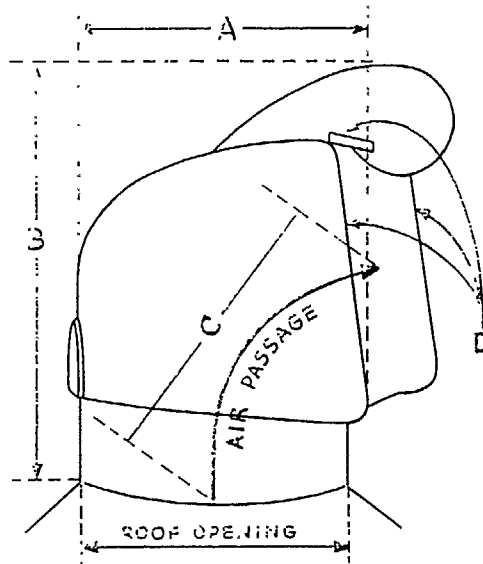


REAR VIEW

Note the many superior features of this unusually efficient ventilator on the following pages...

Compare These Swartwout Rotary Features With All Other Round Type Ventilators

Basically Correct Design . . .



The object in the design of any gravity operating roof ventilator is to secure the greatest capacity per size of roof opening *without an excessively large superstructure*. To accomplish this it is obvious the *discharge flow must always be with the wind*—not against it. Therefore the discharge opening must point in only one direction (of wind travel)—not on all sides at the same time. The *rotary design alone* fulfills these basic requirements. And only the *Swartwout Rotary* provides all of the following basically correct and therefore highly advantageous and desired features.

1. The head revolves at the slightest change in wind direction—always keeping discharge opening in direct line with wind flow—but

never permits "spinning" from momentum or centrifugal force.

2. The diameter of ventilator head is approximately *same size as roof opening*—(A) not up to twice as large as in some ventilator designs. This makes a neater, more workmanlike installation—less expensive to install and maintain (less paint expense)—better appearing—exerting less wind resistance, less liable to be effected by storms and high winds (especially desirable when ventilators are installed on stacks)—more sturdier construction—lighter weight and less roof load.
3. The overall height (B) is low per size ventilator. This has same advantages as noted above—with special emphasis on low erection costs and better appearance.
4. An exceptional *short free air passage* through ventilator. (C) The *short travel* from ventilator inlet to ventilator outlet *reduces* friction resistance to the minimum; the *free passage* induces greater velocity; together they provide large capacity and maintain high efficiency under *all operating conditions*.
5. There are no interior baffle plates for the air to negotiate—no sharp turns, backtracking, etc., which retard circulation and reduce capacity—no interior drain pipes (no rain or snow can enter the Swartwout Rotary). See complete construction analysis on pages B-6 and B-7.
6. Maximum utilization of outside wind currents by wind play over *three-fourths* of outlet area (D)—(three sides of opening out of four.) Also *positive "pull" in direct line with discharge*. The great importance of this feature will be seen on the following page.

Superior "SUCTION" Performance

Note: The illustrations and features mentioned on this page or any page of this Bulletin are not to be construed as referring to any individual MAKE of

ventilator as compared with the Swartwout Rotary—but as a comparison of basic designs embodied in the rotary and stationary ventilator principles.

Wind Action On Roof Ventilators

The winds blowing over and around any roof ventilator have definite *measurable* effect. In an efficiently designed ventilator they substantially increase the discharge capacity by exerting "pull" or suction on the ventilator which is *in addition* to natural gravity action. It follows, therefore, that a design which takes the greatest possible advantage of outside wind currents is the more logical, the most efficient, and more economical, giving greater returns for the investment.

A study of the sketches on this and the following page will show why the Swartwout Rotary principle utilizes wind action to greater extent than the stationary principle. The design of a round stationary ventilator provides for *upward discharge at all points around its entire circumference*. No matter which way the wind blows, therefore, it is always blowing *against*

one-half of the discharge area. This is bound to have a *retarding effect on that portion* (Fig. A). True, it may tend to increase the discharge from the *opposite area* in sufficient quantity to actually show an increased capacity overall—but that does not change the fact of retarded efficiency of shaded area.

Contrast this with the rotary principle (Fig. B). The wind *never* blows against any part of the discharge area but always away from it. Thus, increased capacity is secured through suction effect *without sacrificing any gravity capacity through retarded discharge areas*. It follows that *greater discharge per square foot of opening* results. This increase in capacity is in direct proportion to outside wind velocity as indicated by capacity tables on page B-11.

Now let's analyze the *method* of "pull" exerted on the respective designs (see following page):

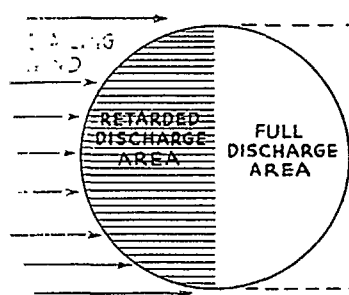


Fig. A

ROUND STATIONARY VENTILATOR

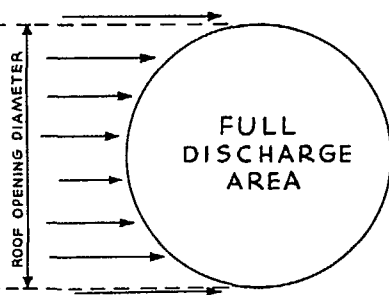
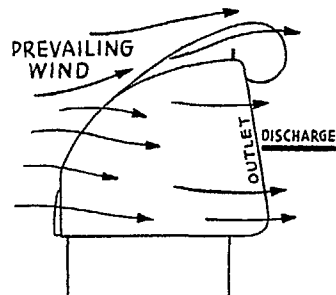


Fig. B

SWARTWOUT ROTARY VENTILATOR



The Direct, Positive "Pull" of the Swartwout Rotary

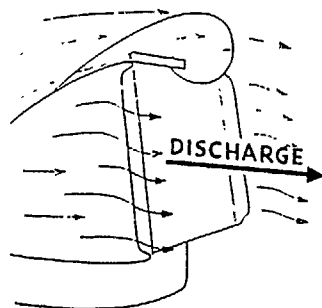


Figure C
Swartwout
Rotary

As illustrated in Fig. C, the Swartwout Rotary discharge is in *direct line with outside flow*. Small flares on the sides and top of the opening "catch" the wind causing eddy currents which set up a vacuum over the entire discharge area. This is a *direct and positive* high powered "pull" which accelerates discharge and greatly increases capacity. With the stationary design (Fig. D) the wind blows at *right angles* across the top or discharge area. Obviously the "pull" exerted is not comparable in any way with that obtained by the rotary principle.

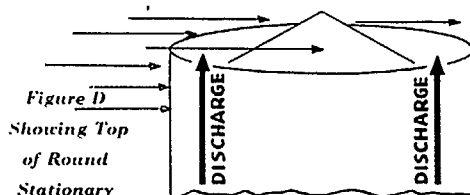


Figure D
Showing Top
of Round
Stationary

But some will advance that the "pull" on the stationary design is obtained by the wind passing under the side (sometimes called a "suction band") and traveling upward between side and outlet stack (Fig. F). Let's analyze this:

The Greater Area "Pull" of the Swartwout Rotary

It will be noted (Fig. E) that a *positive and direct pull* is exerted on *three sides* of the entire discharge area of the Swartwout Rotary—or, at the very minimum, *three fourths* of the total outlet area. Now, even granting that suction in the stationary design may be secured as per Fig. F, the greatest possible area to be affected would be one-half of the total outlet area—and in no measure the direct pull obtained with the rotary.

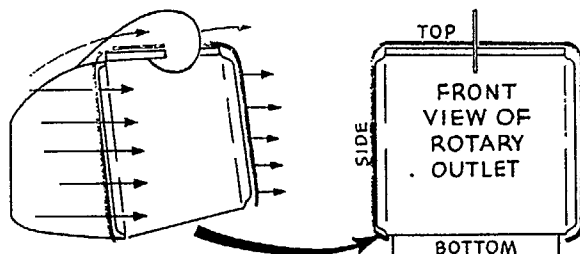


Figure E—Swartwout Rotary positive "suction" exerted on three sides—three-fourths of outlet area.

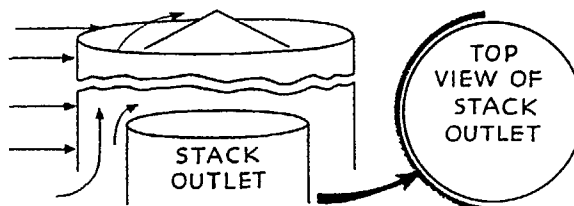
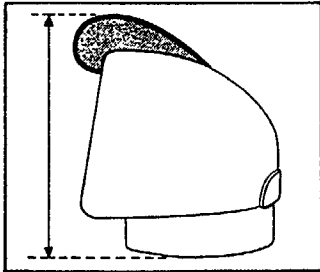


Figure F—Round Stationary Ventilator "suction" exerted at best on but one-half of outlet area.

Construction

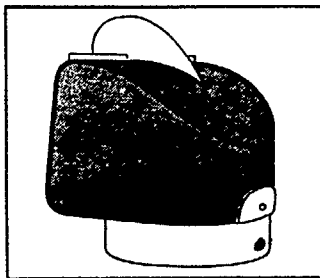
Extreme care is taken in the construction of the Swartwout Rotary to produce a product not only superior in performance but superior-built as well—an exceptionally high quality article—one that will

render many years of trouble-free service. On this and the following page attention is called to some of the constructional features which combine to make this quality ventilator.



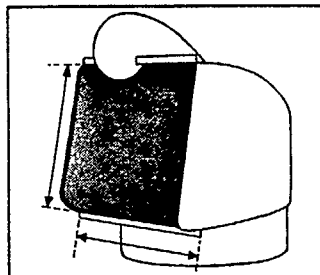
Wind Vane . . .

This new design low slung wind vane keeps the overall height to a new minimum—enhancing ventilator appearance and giving maximum stability. It is extremely sensitive to every wind variation, yet holds the ventilator absolutely steady in the wind and prevents any “spinning” from momentum or centrifugal force.



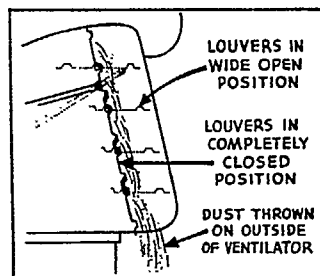
Body . . .

New curved design with modern lines—gives a very pleasing appearance to the ventilator and provides the ultimate in efficient operation. Extra heavy materials are used with rigid construction as shown on opposite page. No bolts or screws used and ALL SIZES SHIPPED COMPLETELY ASSEMBLED.



Oversize Outlet . . .

Designed after extensive experience and research to provide extra large capacity under all operating conditions. Its 30% extra area assists gravity circulation and also gives extra impetus to suction “pull.”



Louvers . . .

Outside adjustable louver dampers are standard equipment. The efficient louvers and operating mechanism provides complete regulation of ventilation. On sizes 24" and up three-position louvers are furnished. They can easily be set and locked either wide open or completely shut.

When closed, any accumulation of dust, dirt, or lint on the louvers is automatically thrown on the outside of building by their downward and outward tilt.

Interior Members . . .

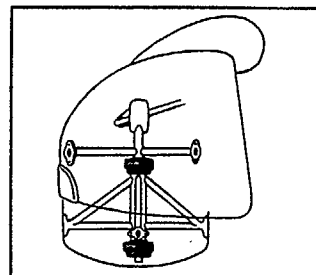
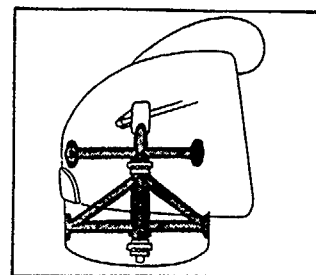
Here is a triumph of modern mechanical genius. Three cross braces of elliptical seamless steel tubing are *welded* to center upright hollow steel shaft—making a one-piece rigid structure of exceptional strength and durability. Its strength is attested by photograph at lower left. Streamline tubing reduces friction to the minimum, thus in no wise interfering with capacity operation. Interior members are hot galvanized after assembly. Joints with body are made with heavy gauge steel stamping shoes and strong steel rivets.



Close-up of Weld

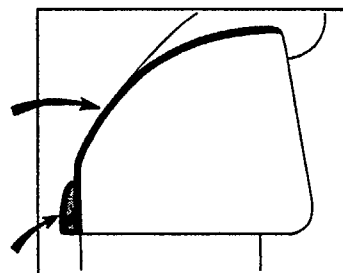
Bearings . . .

Stainless steel ball bearings in small stamped steel housings, fully enclosed, dust tight and corrosion proof, make a permanently sealed, oilless, trouble-free bearing. Sensitive—will not stick. Upper bearing carries the load—lower bearing, the thrust. Both are identical, with various sizes for various sized ventilators.



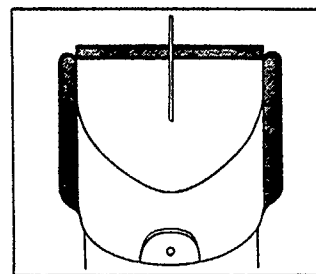
Curved Back . . .

Streamline effect reduces wind resistance to the minimum. Also prevents any accumulation of snow or ice forming on ventilator.



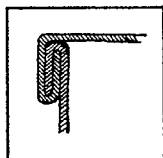
Counter Weight . . .

Accurately weighted for each size to form perfect balance with extra weight of louvers on front of ventilator. This keeps ventilator in perfect balance at all times.



Flared Edges . . .

The top and both sides of outlet opening are flared to divert wind currents and increase suction capacity. This is one of the "secrets" of the Swartwout's large capacity. Just the right curve and depth of flare was only attained after extensive experience and research.



Seams . . .

All joints are double seamed for strength and rigidity. No bolts used and there is nothing to get loose and develop leakage.

Materials

Stock ventilators are constructed of high quality:

- (1) Galvanized copper bearing steel sheets,
- (2) Copper sheets.

of thickness per size indicated in table below. Interior members are all galvanized seamless steel tubing as described on page B-7. In copper ventilators these members are painted two coats of special acid-resisting coating for additional protection.

Ventilators made of special materials such as

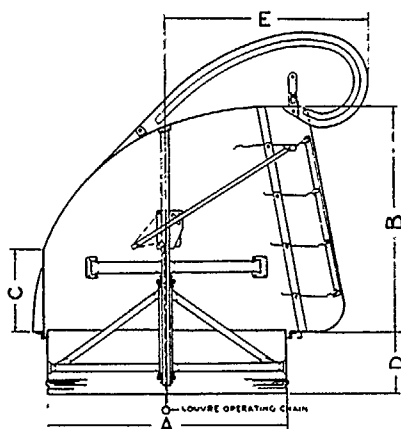
Asbestos protected metal

Aluminum

Lead Coated Steel

can be furnished to order, but not shipped from stock. Interior members in all instances will be standard steel tubing with special painting or with lead coating on special order.

Dimensional Detail



Painting

For acid and alkali conditions we recommend a special rubber-base coating which forms a tough highly-resistant film or skin over the metal for additional protection. Two coatings will be applied at the factory for small additional cost.

Screened Ventilators

Bird screen of standard $\frac{3}{4}$ " mesh galvanized wire will be furnished at slight additional cost. It is mounted in front of louvers—not in the throat. It is easily accessible for cleaning, removable for painting, etc. It does not interfere with damper operation or restrict the capacity in any noticeable amount.

Screens made of special materials furnished when required at additional cost proportionate to metal used.

DIMENSIONS OF SWARTWOUT ROTARY BALL BEARING VENTILATORS

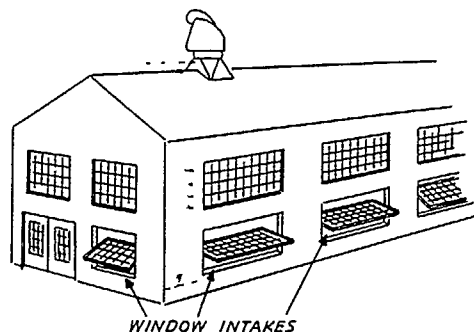
A	B	C	D	E	Area of Throat Opening Sq. Ft.	Area of Outlet Opening	Gauge Iron	Wgt. of Copper (Oz.)	Net Wght.	Crated Wght.	Code Word
12	11 $\frac{3}{8}$	4 $\frac{7}{8}$	4 $\frac{7}{8}$	11 $\frac{7}{8}$	.785	1.03	24	18	20	27	Sulciforme
14	13 $\frac{3}{8}$	5 $\frac{3}{8}$	4 $\frac{7}{8}$	13 $\frac{3}{4}$	1.069	1.39	24	18	25	32	Sulcipenne
16	15 $\frac{1}{2}$	6 $\frac{1}{4}$	5 $\frac{3}{4}$	15 $\frac{3}{8}$	1.396	1.83	24	18	31	40	Suleiman
18	17 $\frac{1}{2}$	6 $\frac{7}{8}$	5 $\frac{3}{4}$	16 $\frac{7}{8}$	1.767	2.30	24	18	42	53	Sulfacide
20	19 $\frac{1}{2}$	7 $\frac{5}{8}$	5 $\frac{3}{4}$	18 $\frac{3}{4}$	2.182	2.84	24	18	49	65	Sulfatable
24	23 $\frac{1}{8}$	8 $\frac{7}{8}$	5 $\frac{3}{4}$	19 $\frac{3}{8}$	3.142	4.00	24	20	65	85	Sulfatado
30	29	11	8 $\frac{3}{8}$	26 $\frac{7}{8}$	4.909	6.33	22	24	120	170	Sulfatage
36	34 $\frac{3}{4}$	13 $\frac{1}{8}$	8 $\frac{3}{8}$	31 $\frac{5}{8}$	7.069	9.02	22	24	175	250	Sulfatamos
42	40 $\frac{5}{8}$	15 $\frac{1}{8}$	8 $\frac{3}{8}$	36	9.621	12.40	20	28	290	375	Sulfataria
48	46 $\frac{3}{8}$	17 $\frac{1}{8}$	10 $\frac{3}{8}$	41	12.51	15.92	20	28	370	495	Sulfataron
54	52 $\frac{1}{8}$	19 $\frac{1}{4}$	10 $\frac{3}{8}$	47	15.90	20.09	20	28	520	675	Sulfateur
60	57 $\frac{7}{8}$	21 $\frac{1}{4}$	10 $\frac{3}{8}$	52	19.63	24.82	20	28	605	780	Sulfatique
66	63 $\frac{3}{8}$	23 $\frac{3}{8}$	10 $\frac{3}{8}$	57	23.76	29.93	20	28	710	900	Sulfate
72	69 $\frac{3}{8}$	25 $\frac{3}{8}$	10 $\frac{3}{8}$	63	28.27	35.53	20	28	850	1100	Sulfazote

Capacities of Swartwout Rotary Ventilators

There are three factors (exclusive of ventilator size) each varying with the individual installation, which determine the ventilator capacity actually secured on any installation. These are:

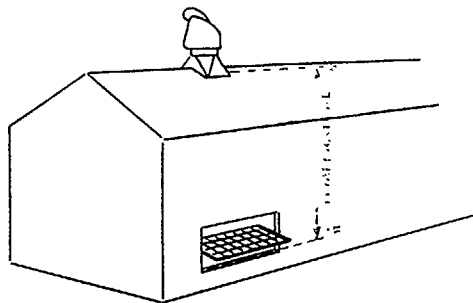
1. Ventilator Height . . .

or distance between air intakes (windows, doors, or specially provided intakes) and ventilator outlets (usually roof height). The greater this distance is, the more capacity will be secured.



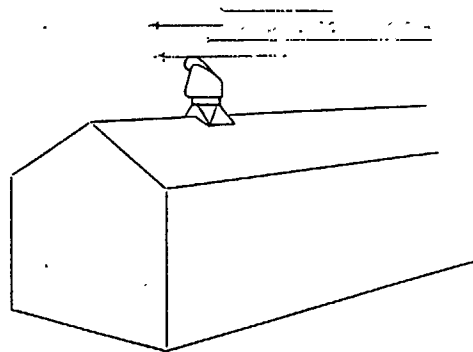
2. Temperature Difference . . .

between the incoming air (at intakes) and outgoing air (at ventilator). When any great difference exists between *outside and inside floor level temperatures* (such as Northern States, winter conditions), to estimate ventilator capacities the "temperature difference" should be secured by subtracting *floor level inside temperature* from *roof level inside temperature*. Also it should be borne in mind that the temperature under the roof *before* opening ventilators is always greater than after they have been in operation for a time, because circulation reduces the inside temperature. The greater the "temperature difference" is, the more capacity will be secured.



3. Velocity of Outside Air Currents . . .

As shown on pages 4 and 5, these substantially increase the capacity of the Swartwout Rotary in proportion to their velocity. Naturally you must have a basis for determining what velocity figure to use. The United States Weather Bureau has supplied this information in the form of average wind velocities, summer and winter seasons, for all localities in the United States. The complete table is shown on page B-12. Select that point nearest your location and use the next highest whole number to fractional velocity figure given.



On opposite page appears a simplified table from which anyone can determine the minimum capacity that will be received from any size Swartwout Rotary under any combination of actual working conditions.

Usually a slightly greater capacity will be secured as these figures lean toward the conservative rather than attempting to "see how high they could be made." We invite comparison with other published capacities.

How To Estimate Capacities

On this and the following page, three tables are shown from which can be determined the operating capacity in c.f.m. of any size Swartwout Rotary under practically any given combination of conditions encountered in actual service.

Table B-1 shows base ratings used in calculations. These base ratings are not to be taken as a general capacity figure because they do not take into consideration height, temperature and wind factors.

Table B-2 shows height factors with height of ventilator to be ascertained as indicated on preceding page.

Table B-3 shows outside wind velocity factors. As wind velocity has different accelerating effects in relation to height and temperature factors, it will be noted a *different* wind factor must be used for the same velocity for *different* height and temperature factors.

To determine capacity proceed as follows: Multiply base rating (from Table B-1) by height and temperature factor (Table B-2), multiply result by wind velocity factor (Table B-3). The result will be capacity in c.f.m. for the given condition. Prevailing wind velocity can be secured from Table B-4.

Example: Find capacity of 60" Swartwout Rotary installed on roof 55 feet above inlets with average temperature difference of 35° located at Washington, D. C., for summer ventilation.

$$7,459 \times 1.62 \times 1.16 = 14,016 \text{ c.f.m.}$$

In determining wind velocity factor it is assumed ventilators are located in free air—not back of obstructions such as other buildings, walls, monitors, stacks, etc. It is the free direct pull of the wind which gives the Swartwout Rotary a tremendous advantage.

TABLE B-1 — BASE RATINGS

Size	C. F. M.	Size	C. F. M.	Size	C. F. M.	Size	C. F. M.
12"	298	20"	828	42"	3656	66"	9025
14"	407	24"	1193	48"	4777	72"	10743
16"	532	30"	1462	54"	6042		
18"	673	36"	2687	60"	7459		

TABLE B-2 — HEIGHT AND TEMPERATURE FACTORS

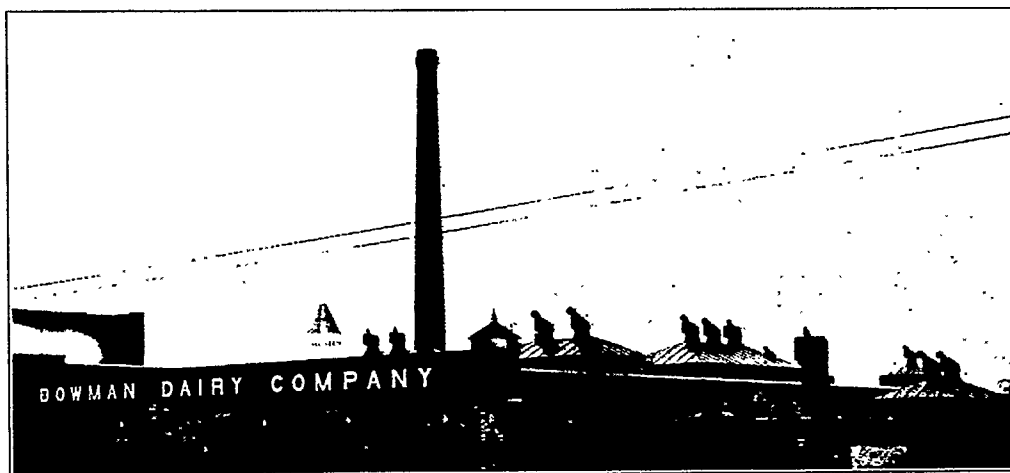
Height of Outlet Above Inlet	TEMPERATURE DIFFERENCE											
	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
10'	.38	.49	.58	.61	.72	.77	.83	.87	.90	.94	.97	1.01
15'	.44	.58	.64	.78	.84	.90	.96	1.02	1.05	1.10	1.14	1.18
20'	.49	.64	.76	.86	.93	1.00	1.07	1.13	1.17	1.22	1.26	1.31
25'	.54	.70	.84	.95	1.02	1.10	1.18	1.25	1.29	1.34	1.39	1.45
30'	.59	.77	.91	1.03	1.12	1.20	1.29	1.36	1.40	1.47	1.51	1.57
35'	.62	.81	.97	1.09	1.18	1.27	1.36	1.43	1.49	1.55	1.60	1.67
40'	.66	.86	1.02	1.15	1.25	1.34	1.43	1.52	1.57	1.64	1.69	1.76
45'	.69	.90	1.07	1.20	1.30	1.40	1.50	1.58	1.64	1.71	1.76	1.84
50'	.72	.93	1.11	1.26	1.36	1.46	1.56	1.65	1.71	1.78	1.84	1.91
55'	.74	.97	1.15	1.30	1.41	1.51	1.62	1.71	1.77	1.84	1.90	1.98
60'	.77	1.01	1.20	1.35	1.46	1.57	1.68	1.77	1.83	1.92	1.98	2.05
65'	.80	1.04	1.23	1.40	1.51	1.62	1.73	1.83	1.90	1.97	2.04	2.12
70'	.82	1.07	1.27	1.43	1.55	1.67	1.79	1.89	1.96	2.04	2.10	2.19
75'	.84	1.10	1.31	1.48	1.60	1.72	1.84	1.94	2.01	2.10	2.17	2.26
80'	.86	1.13	1.34	1.52	1.64	1.76	1.88	1.99	2.06	2.15	2.22	2.30

TABLE B3 — WIND VELOCITY FACTORS

Wind Velocity In Miles per Hour	TEMPERATURE AND HEIGHT FACTORS										
	.38	.40	.42	.44	.46	.48	.50	.52	.54	.56	.58
	.39	.41	.43	.45	.47	.49	.51	.53	.55	.57	.59
3	1.30	1.28	1.27	1.26	1.25	1.24	1.23	1.22	1.21	1.20	1.19
5	1.50	1.48	1.46	1.44	1.43	1.41	1.39	1.38	1.36	1.35	1.33
7	1.82	1.78	1.75	1.72	1.69	1.66	1.63	1.61	1.59	1.56	1.54
9	2.14	2.10	2.06	2.02	1.99	1.96	1.93	1.89	1.87	1.84	1.81
11	2.47	2.43	2.37	2.32	2.28	2.23	2.19	2.16	2.11	2.08	2.04

Wind Velocity In Miles Per Hour	TEMPERATURE AND HEIGHT FACTORS										
	.60 .61	.62 .65	.66 .69	.70 .73	.74 .77	.78 .81	.82 .85	.86 .89	.90 .93	.94 .97	.98 1.01
3	1.18	1.18	1.17	1.16	1.14	1.13	1.12	1.11	1.10	1.10	1.09
5	1.32	1.31	1.29	1.27	1.25	1.24	1.22	1.21	1.20	1.19	1.18
7	1.52	1.50	1.47	1.43	1.41	1.38	1.36	1.34	1.32	1.31	1.29
9	1.78	1.76	1.71	1.67	1.63	1.59	1.55	1.52	1.49	1.46	1.44
11	2.02	1.98	1.93	1.87	1.82	1.78	1.73	1.69	1.66	1.62	1.58

Wind Velocity In Miles Per Hour	TEMPERATURE AND HEIGHT FACTORS											
	1.02 1.05	1.06 1.09	1.10 1.17	1.18 1.25	1.26 1.33	1.34 1.41	1.42 1.49	1.50 1.57	1.58 1.73	1.74 1.89	1.90 2.05	2.06 2.30
3	1.08	1.08	1.07	1.06	1.04	1.03	1.03	1.02	1.02	1.01	1.00	1.00
5	1.17	1.16	1.15	1.14	1.13	1.11	1.10	1.09	1.08	1.07	1.06	1.06
7	1.28	1.26	1.25	1.23	1.21	1.19	1.17	1.16	1.16	1.14	1.13	1.13
9	1.41	1.39	1.37	1.33	1.31	1.29	1.27	1.25	1.24	1.22	1.20	1.20
11	1.54	1.51	1.49	1.44	1.40	1.37	1.35	1.33	1.32	1.29	1.27	1.26

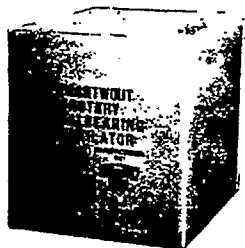


Swartwout Rotaries on a prominent Dairy in Chicago, Illinois

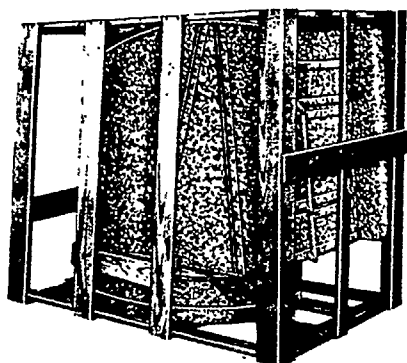
AVERAGE WIND VELOCITIES COMPILED FROM U. S. WEATHER BUREAU RECORDS

State	City	Average Wind Velocity	Prevailing Wind Direction	Average Wind Velocity	Prevailing Wind Direction
		Summer	Summer	Winter	Winter
Ala.	Birmingham..	5.2	S	8.5	N
	Mobile.....	8.6	SW	10.4	N
Ariz.	Phoenix.....	6.0	W	6.4	E
Ark.	Little Rock.....	7.00	NE	8.7	NW
Calif.	Los Angeles.....	6.0	SW	6.3	NE
	San Francisco.....	11.0	SW	7.6	N
Colo.	Denver.....	6.8	S	7.5	S
Conn.	New Haven.....	7.5	S	9.7	N
D. C.	Washington.....	6.2	S	7.1	NW
Fla.	Jacksonville.....	8.7	SW	9.2	NE
	Tampa.....	7.0	E		
Ga.	Atlanta.....	7.5	NW	12.1	NW
	Savannah.....	7.8	SW	9.5	NW
Ida.	Boise.....	5.8	NW		
Ill.	Chicago.....	10.2	NE	12.5	W
	Peoria.....	8.2	S		
Ind.	Indianapolis.....	9.0	SW	11.5	SW
Iowa	Des Moines.....	6.6	SW		
Ky.	Louisville.....	8.0	SW	9.9	SW
La.	New Orleans.....	7.0	SW	8.8	N
Maine	Portland.....	7.5	S	9.2	NW
Md.	Baltimore.....	6.9	SW	7.8	NW
Mass.	Boston.....	9.2	SW	11.2	W
Mich.	Detroit.....	10.3	SW	12.7	SW
Minn.	Minneapolis.....	8.4	SE	11.3	NW
Miss.	Vicksburg.....	6.2	SW	8.3	SE
Mo.	Kansas City.....	9.5	S		
	St. Louis.....	9.4	SW	11.6	S
Mont.	Helena.....	7.3	SW		
Nebr.	Lincoln.....	9.3	S	10.5	S
Nev.	Reno.....	7.4	W		
N. J.	Trenton.....	10.0	SW		
	Albany.....	7.1	S	8.1	S
N. Y.	Buffalo.....	12.2	SW	17.2	W
	New York.....	12.9	SW	17.1	NW
N. M.	Santa Fe.....	6.5	SE	7.8	NE
N. C.	Asheville.....	5.6	SE		
	Wilmington.....	7.8	SW	8.5	SW
N. Dak.	Bismarck.....	8.8	NW	9.1	NW
Ohio	Cleveland.....	9.9	S	13.0	SW
	Cincinnati.....	6.6	SW		
Okla.	Oklahoma City.....	10.1	S	12.0	N
Oreg.	Portland.....	6.6	NW	7.5	S
Pa.	Philadelphia.....	9.7	SW	11.0	NW
	Pittsburgh.....	9.0	NW	11.7	W
R. I.	Providence.....	10.0	NW	12.8	NW
S. C.	Charleston.....	9.9	SW	10.6	SW
Tenn.	Chattanooga.....	6.5	SW		
	Memphis.....	7.5	SW	9.7	S
Texas	Dallas.....	9.4	S		
	Houston.....	7.7	S		
	San Antonio.....	7.4	SE	8.0	NE
	El Paso.....	6.9	E	10.4	NW
Utah	Salt Lake City.....	8.2	SE	6.7	SE
Vt.	Burlington.....	8.9	S	11.8	S
Va.	Norfolk.....	10.9	S	12.5	N
	Richmond.....	6.2	SW	7.9	SW
Wash.	Seattle.....	7.9	S	11.3	SE
	Spokane.....	6.5	SW	7.1	SW
W. Va.	Parkersburg.....	5.3	SE	7.5	SW
Wisc.	Milwaukee.....	10.4	S	11.5	W
Wyo.	Cheyenne.....	9.2	S		

Crating and Shipping Information



Sizes 12" and 14" are packed in heavy corrugated paper cartons for shipment



Large size Rotaries, 18" and up are shipped securely packed in wooden crates as pictured at left.

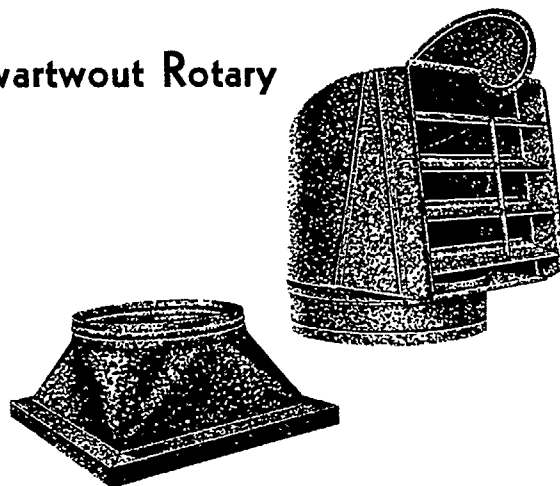
All Swartwout Rotaries are shipped completely assembled ready for erection. Their compact design, permitting less over-all dimensions, makes them less bulky and lighter than certain other types—thus saving transportation charges and facilitating handling. The larger sizes are securely packed in strong wooden crates as illustrated and smaller sizes shipped in corrugated wooden cartons.

Unless otherwise specified, L.C.L. shipments where possible will be made via Universal or National Car-loading Companies. Express and truck shipments will be made when specified.

Installing the Swartwout Rotary

It is often possible to effect a substantial saving in the erection cost when Swartwout Rotaries are installed in comparison with other types. This is due to their light weight, compactness, ease of handling, and *complete factory assembling*. There is no assembly or fitting of the ventilator parts together on the job. Erection is quicker, easier, and cheaper, and is an item which should be carefully considered when comparing two or more contemplated installations. The Swartwout Company does not do the installing itself as it can generally be done with less expense by local labor. Any mill maintenance crew, or good commercial sheet metal contractor can handle the job without difficulty.

For ease of hoisting to the roof large size rotaries are fitted with hoisting hooks on side.

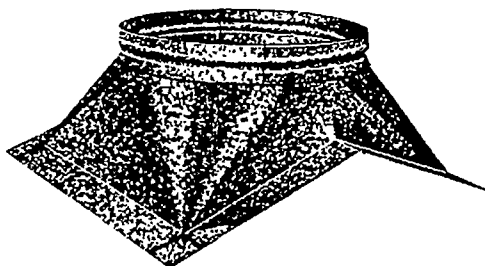


Maintenance

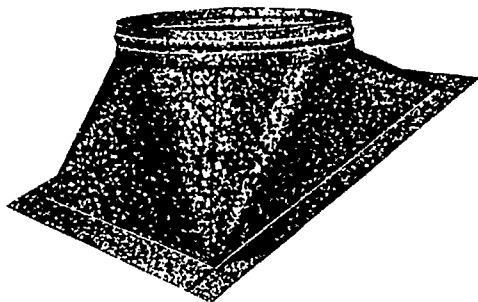
One of the advantages in installing the Swartwout Rotary is that it requires no maintenance except (when galvanized iron is used) ordinary periodical painting. No lubrication is necessary. Painting galvanized iron every two to three years (in accordance with the service conditions) with good metal

paint is recommended as that will prolong the life of any metal. When desired, a periodic inspection of your Rotary installation will be made without charge by a Swartwout Representative who will report to you any suggestions or recommendations for possible improvement in your ventilation.

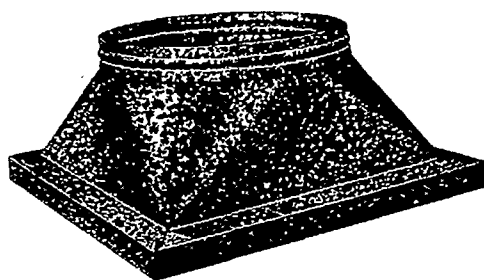
Swartwout Bases



*Type P
For Peak Roof*



*Type S
For Slope or Flat Roof*



*Type R
For Curb Installation*

Why it is more advantageous to use the combination of **SWARTWOUT ROTARY AND SWARTWOUT BASE**

The same mechanics who construct the Swartwout Rotary Ventilator naturally are qualified to a greater degree than others to construct the base. They are familiar with every small detail of construction—have exact dimension patterns to work from—and having built thousands, can make a perfectly proportioned, evenly balanced base that's a perfect match with the ventilator.

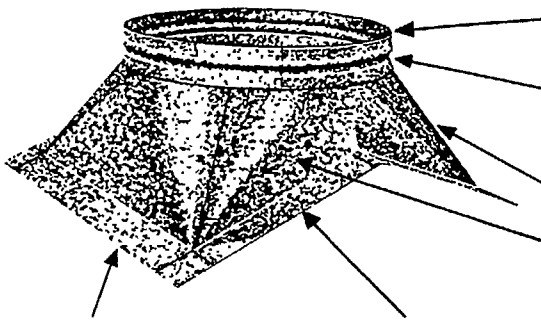
Then, too, in using a Swartwout Base you are assured of the *proper* construction—a base designed by the same engineers who designed the ventilator. You secure the proper gauge metal (two gauges heavier than the ventilator), the proper shaping, the oversize roof opening, and a perfect roof fit.

Thus, while you may be able to secure commercial bases for a few dollars less, the slight saving is more than offset by the chances you take on securing an inferior product and a misfit combination. Don't jeopardize your ventilator investment by attempting to save a few dollars in the cost of the bases. Swartwout supplies them at as low a price as possible for anyone to supply products of equal high quality.

CONSTRUCTION

Three different types are furnished as here illustrated. Types P and S are made to exact pitch of roof. Type S is also used on flat roofs where curb construction is omitted. Type R can be used on slope where curb construction is desired. "Hold down" or anchor straps are standard construction on Type R base; and can also be furnished on other types by special order. Lead flashing can be furnished for installations on corrugated roofs, at slight extra cost.

Detail Analysis



Top of collar absolutely level and true round. Lap of 1" or over.

Collars are grooved and strongly riveted to body of base with 5" spacing of rivets. Cannot spring apart.

Bases built square to round—giving oversize opening in bottom. See exact dimensions below.

Galvanized steel *two gauges heavier* than ventilator size for size—is standard construction.

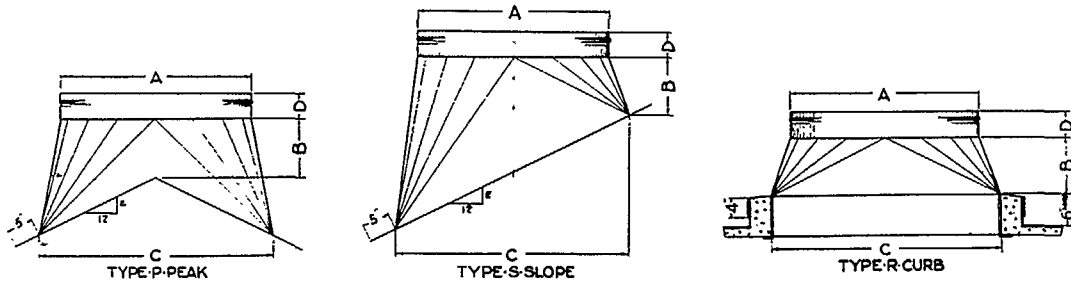
Condensation gutters can be furnished on special order for installations where excessive humidity may cause dripping and resultant damage.

Five inch flanges accurately bent outward to fit roof pitch. All bases made to exact roof dimensions and fit properly.

Heavy anchor straps furnished with all "R" Type bases—and with other types by special order.

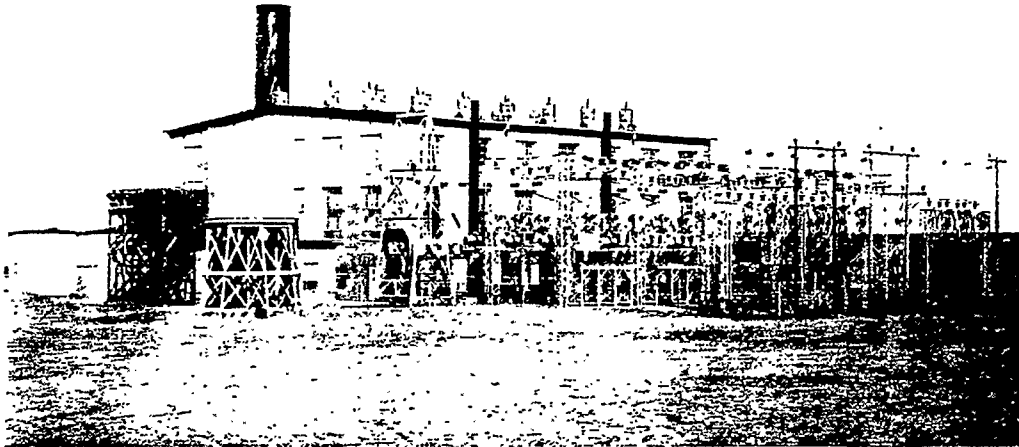
IMPORTANT: When ordering bases always state *TYPE* desired (P, S, or R) and state pitch of roof.

DIMENSIONS

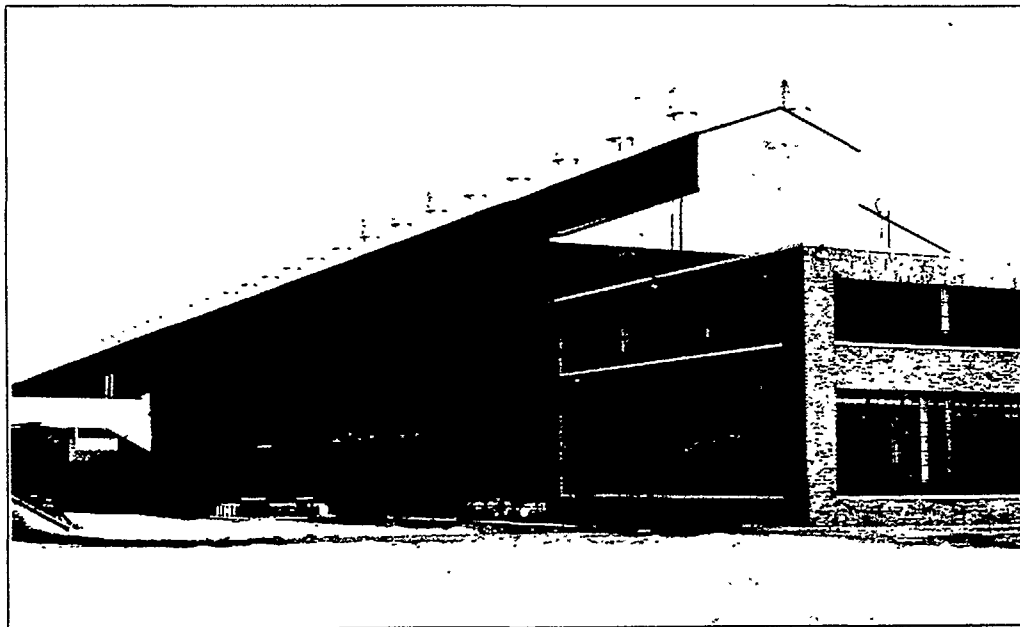


A	B	C	D	E	Gauge Iron	Weight of Copper (oz.)	Aver. Net Wt.	Aver. Crated Wt.
12	8	18x18	5	Required Dimension Slope Per Foot	22	24	18	20
14	8	20x20	5		22	24	26	28
16	8	22x22	5		22	24	35	37
18	8	24x24	5		22	24	38	40
20	8	28x28	5		22	24	45	50
24	11	32x32	5		22	24	55	65
30	11	38x38	5		20	28	80	95
36	11	44x44	5		20	28	95	110
42	13	52x52	7		18	32	120	150
48	13	58x58	7		18	32	140	170
54	13	64x64	7		18	32	160	190
60	16	72x72	7		18	32	200	240
66	19	80x80	7		18	32	240	290
72	19	86x86	7		18	32	300	360

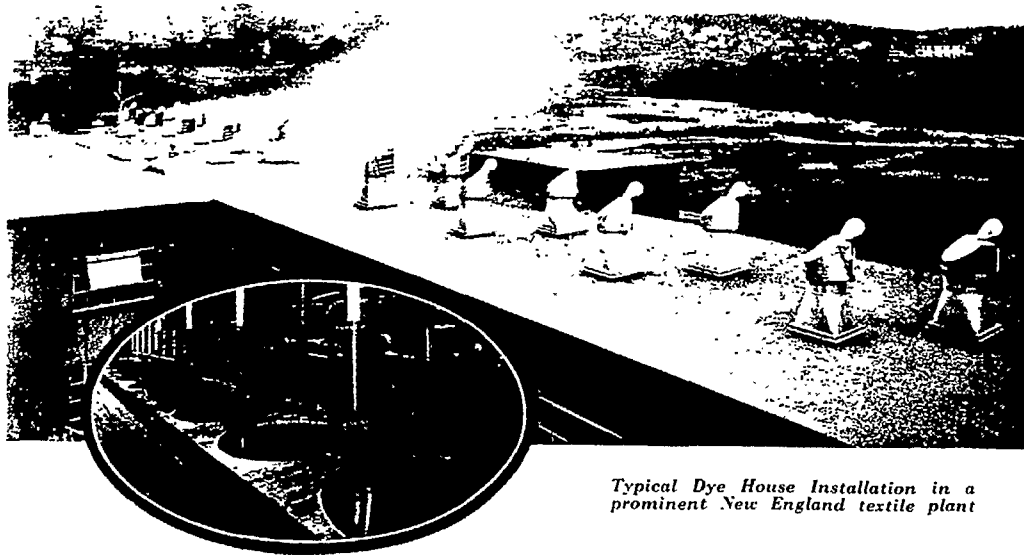
Typical Swartwout Rotary Installations



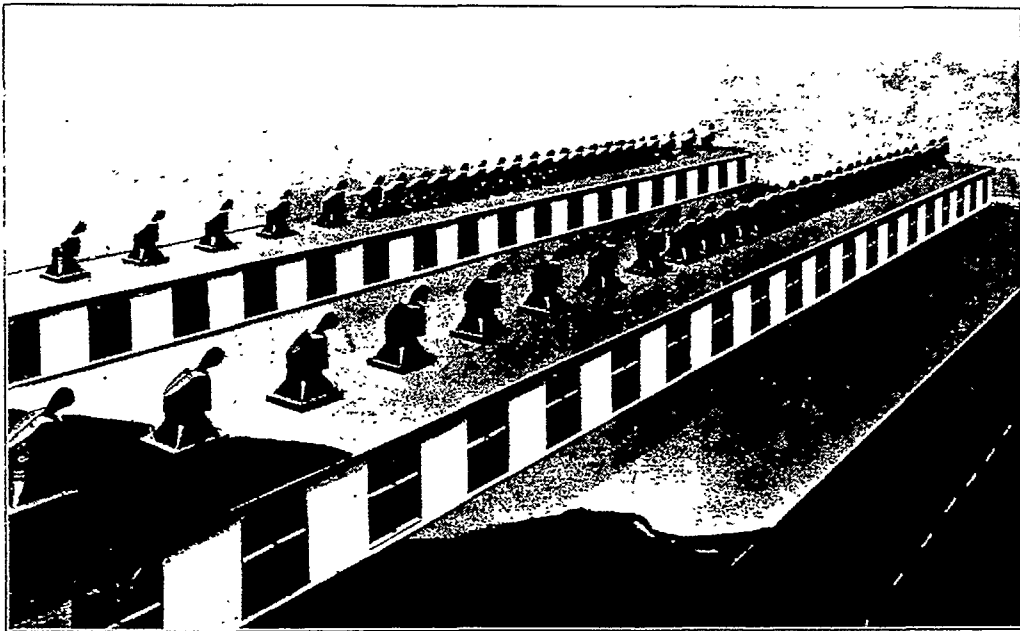
Prominent Power Plant in the Southwest—Swartwout-equipped



Forge Shop in Saginaw, Mich., Swartwout Rotaries remove smoke and fumes



Typical Dye House Installation in a prominent New England textile plant



Swartwout Rotaries on a prominent paper mill



(Above)
This station of the Oklahoma Natural Gas Company at Owosso, Okla., is thoroughly modern in every respect. Swartwout Ventilators help to make it so.



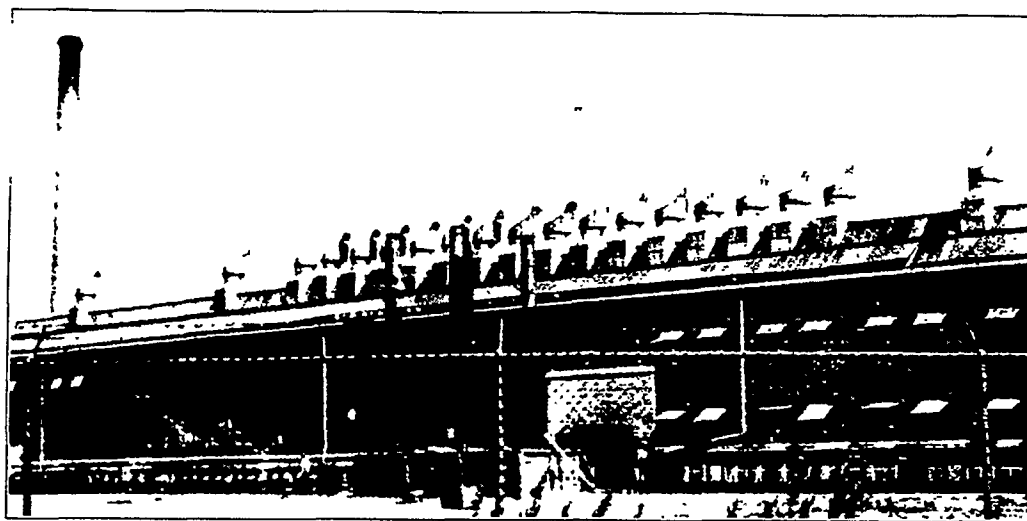
(Left)
One of many Cities Service Gas Compressor Stations, Swartwout equipped.

(Below)
All stations on the Continental Pipeline (Fritch, Texas to Chicago, Ill.) are Swartwout ventilated.



(Below) The Kansas & Texas Pipe Line Company at Mooreland, Okla., is a branch unit of The Empire Company.





Large brass manufacturing plant equipped with Swartwout Rotaries

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Swartwout Engineering Service rendered without obligation

Experienced Engineers of this company are at your service without obligation to you, to assist in the proper solution of your building interior atmospheric problems. They will check your conditions and make recommendations and suggestions for practical solutions with economy. Their years of experience are at your disposal. No matter what the condition or problem—if it relates to your interior building atmosphere—let us assist you. Write, wire, or phone direct or to nearest district office shown below.

... THE SWARTWOUT COMPANY CLEVELAND • OHIO

DISTRICT SALES OFFICE

PRINTED IN U. S. A.

USHO 003398

**PENGLASS
VENTILATORS**

PENNSYLVANIA WIRE GLASS COMPANY
1612 MARKET STREET
PHILADELPHIA, PENNSYLVANIA

USHO 003399

The PENGLOSS Stationary Types of Roof Ventilators are manufactured to meet the ever increasing demand for more efficient ventilation and to combine a Ventilating Recommendation Service (without obligation) which reflects the old established company policy of helpfulness, in the interest of plant management, labor and government.

FRANK L. MARTIN,
President.

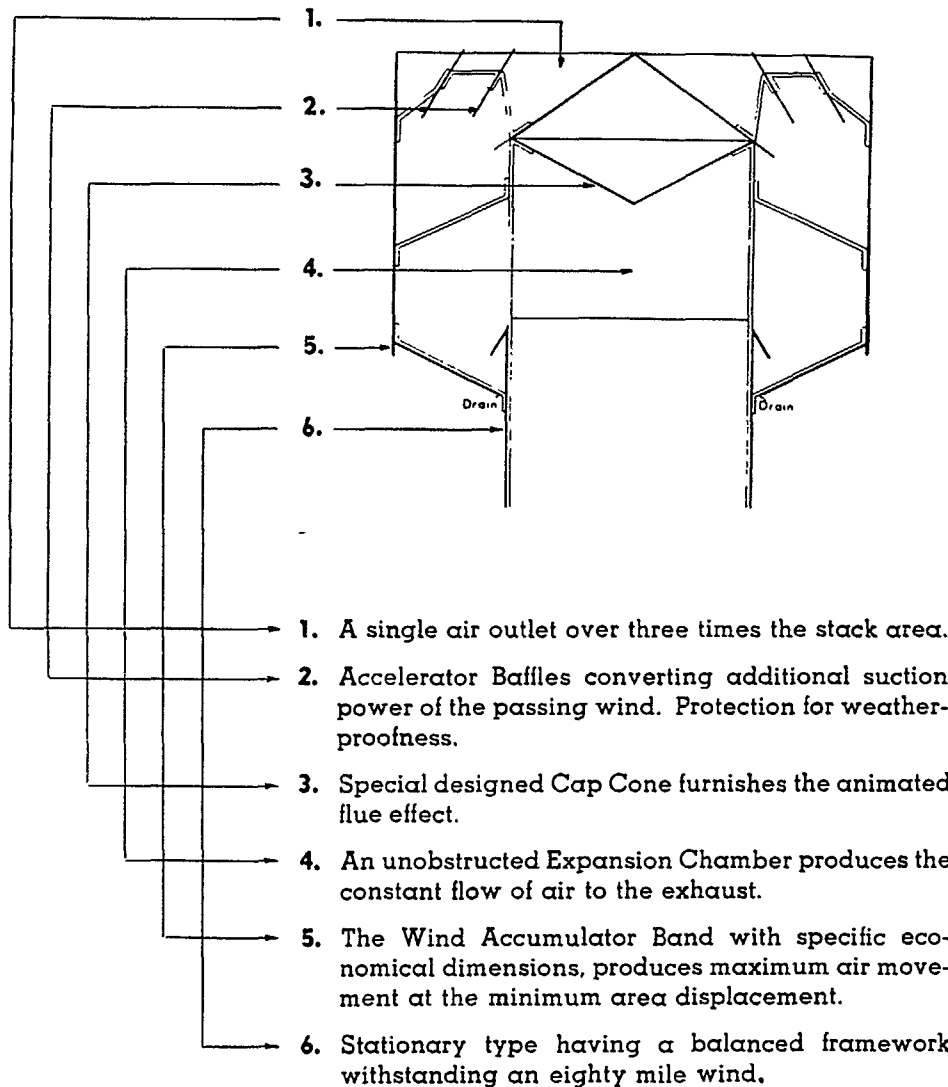
"FOR THE DURATION"

Roof Ventilation in Government and Industrial Buildings is so important to Plant Management and Labor that, during the restriction on metals, used heretofore in manufacturing Ventilators, products such as Cypress Wood—Glass—and Asbestos-Cement Board, are now being used for Ventilator Construction. The use of these substitutes has in no way affected the guaranteed exhaust capacity or required function of the Ventilators.

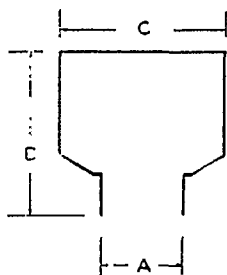
The Pennsylvania Wire Glass Company can furnish Penglass Roof Ventilators manufactured from the above materials.

The 6 Outstanding Performances

PENGLASS ROUND ROOF VENTILATOR

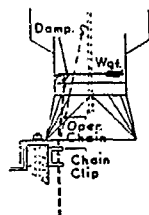


ROUND VENTILATORS—DIMENSIONS—WEIGHTS—GAUGES

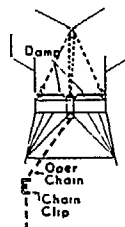


Dimensions, Inches			Approx. Net Weight		Approx. Ship. Weight		Gauges
Size A	B	C	Galv.	A.P.M. A.P.S.	Galv.	A.P.M. A.P.S.	Galv. A.P.M. or A.P.S.
12"	24	23½	23 lb.	45 lb.	55 lb.	80 lb.	24
16"	30	31	38 lb.	69 lb.	80 lb.	114 lb.	24
20"	37	38	70 lb.	100 lb.	133 lb.	180 lb.	24
24"	45	48	100 lb.	158 lb.	180 lb.	262 lb.	24
36"	62	69½	274 lb.	355 lb.	490 lb.	612 lb.	22
*48"	81	91	630 lb.	780 lb.	980 lb.	1217 lb.	20
*54"	92	102	790 lb.	962 lb.	1254 lb.	1613 lb.	20
*60"	100	114	1125 lb.	1390 lb.	1695 lb.	2047 lb.	20
*72"	117	137	1672 lb.	1990 lb.	2468 lb.	2927 lb.	20
*84"	134	159	2300 lb.	2800 lb.	3006 lb.	3779 lb.	18

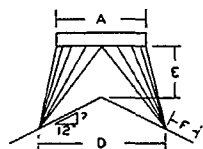
* Shipped knocked down.



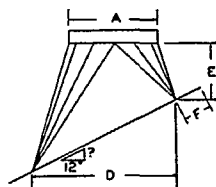
Standard Flat Damper for round ventilators is counter-weighted to keep in open position — a chain clip is furnished to hold damper closed — four feet of chain are furnished with each damper. . . .



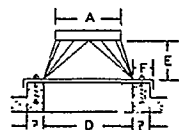
Butterfly Damper is used in ventilators over all electric power houses, on food products buildings and on other establishments where a tight fit damper is required. . . .



TYPE NO. 1
FOR RIDGE ROOFS



TYPE NO. 3
FOR SLOPING ROOFS



TYPE NO. 6
FOR CURBS

STANDARD BASES—DIMENSIONS—WEIGHTS—GAUGES

Dimensions, Inches				Approx. Net Wt. Lb.		Approx. Shipping Wt. Lb.		Gauges
Size A	Size D	Size E	Size F	Galv.	A.P.M. A.P.S.	Galv.	A.P.M. A.P.S.	Galv. A.P.M. or A.P.S.
12"	16x16	10	4"	12	16	56	64	22
16"	21x21	10	4"	25	30	66	77	22
20"	28x28	10	5"	45	55	98	111	22
24"	32x32	10	5"	55	75	106	120	22
36"	45x45	14	6"	110	140	173	200	20
*48"	60x60	**15	6"	140	230	432	495	18
*54"	68x68	**16	6"	240	300	542	618	18
*60"	78x78	**20	6"	300	380	539	627	18
*72"	96x96	**24	6"	460	580	841	968	18
*84"	110x110	**26	9"	660	770	1090	1221	16

* Ventilator base shipped in two pieces.

** Dimension E for Type No. 6 Bases, 48 in. and larger, is one-half of Dimension A.

① Roof Opening: 1" less — each dimension.

HOW TO USE ROUND VENTILATOR CAPACITY TABLES

1. Estimate approximately the cubical contents of building — the total volume of air in cubic feet.
2. Determine the number of air changes per hour required. See page 9.
3. Multiply the cubical contents by the number of air changes to be exhausted per hour. Divide this total by 60 to get the volume per minute.
4. Decide the number of ventilators to be used. Usually one ventilator per bay (where bays are 15-20 ft. in length) is advisable.
5. Divide the volume of air per minute (see No. 3) by the number of ventilators. Result — cubic feet of air to be exhausted per ventilator.
6. Three variable factors enter in the final selection of the proper size ventilator (1) Wind velocity (to simplify and expedite figuring, we have chosen for our capacity table an average of five miles per hour); (2) Inside and outside temperature difference in degrees F.; (3) Height of ventilator above intake (called stack height).

Example :

1. Building 60' (width) $\times$ 200' (length) $\times$ 40' (height) = 480,000 cubic feet.
2. 6 air changes —
3. $480,000 \times 6 \div 60 = 48,000$ cubic feet per minute.
4. 10 ventilators.
5. $48,000 \div 10 = 4,800$ c.f.p.m. for each vent.
6. 5° F. Temp. Difference — 40' stack height — 5 m.p.h. wind — size of each vent 54".

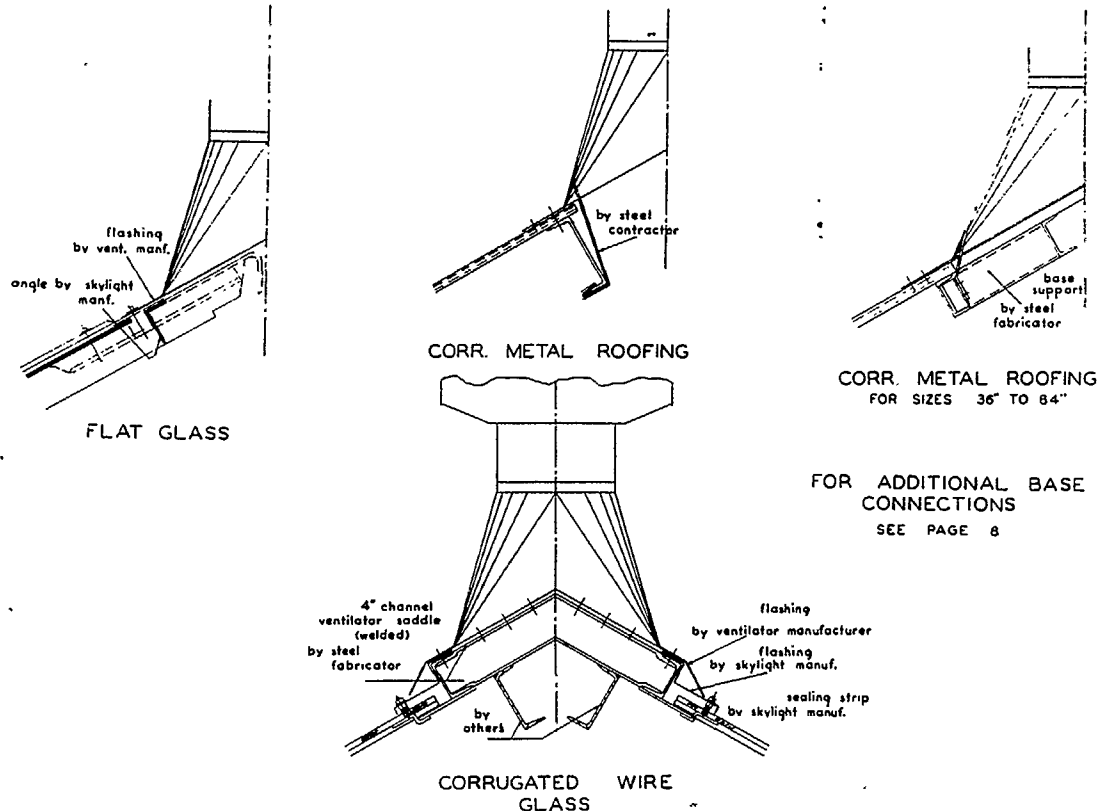
Vent Size	Stack Height in Feet	Wind Velocity 5 miles per hour				Vent Size	Stack Height in Feet	Wind Velocity 5 miles per hour			
		Temperature Difference in F.						Temperature Difference in F.			
		5	10	20	30			5	10	20	30
12" .785 sq ft.	10	182	205	241	271	48" 12.56 sq ft.	10	2901	3275	3850	4325
	20	205	238	292	331		20	3275	3802	4662	5275
	30	224	267	329	381		30	3575	4262	5250	6075
	40	240	292	364	421		40	3825	4650	5801	6712
	50	254	310	392	456		50	4050	4950	6250	7275
16" 1.39 sq ft.	10	322	364	428	480	54" 15.9 sq ft.	10	3712	4192	4928	5536
	20	364	422	518	586		20	4192	4864	5968	6752
	30	397	473	583	675		30	4576	5456	6720	7776
	40	425	517	644	746		40	4896	5952	7424	8592
	50	450	550	695	808		50	5184	6336	8001	9312
20" 2.18 sq ft.	10	510	576	677	739	60" 19.6 sq ft.	10	4547	5135	6036	6781
	20	576	668	820	928		20	5135	5958	7310	8271
	30	629	750	924	1069		30	5605	6683	8232	9525
	40	673	818	1020	1181		40	5997	7291	9094	10525
	50	712	871	1100	1280		50	6350	7761	9801	11407
24" 3.14 sq ft.	10	728	822	967	1086	72" 28.27 sq ft.	10	6565	7414	8716	9791
	20	822	954	1171	1325		20	7414	8603	10555	11942
	30	898	1070	1318	1526		30	8093	9650	11886	13753
	40	960	1168	1456	1686		40	8659	10527	13131	15197
	50	1017	1243	1470	1827		50	9169	11206	14150	16470
36" 7.06 sq ft.	10	1637	1849	2174	2442	84" 38.48 sq ft.	10	8908	10060	11827	13286
	20	1849	2146	2633	2979		20	10060	11673	14323	16204
	30	2019	2407	2965	3431		30	10982	13094	16128	18682
	40	2160	2626	3275	3791		40	11750	14284	17817	20620
	50	2287	2795	3530	4108		50	12441	15206	19200	22348

IMPORTANT: Capacity table based on building having proper air inlets. Minimum — Inlet area equal to exhaust area. We recommend 2 X inlet area over outlet area.

ROUND VENTILATOR

RECOMMENDATIONS FOR BASE CONNECTIONS

To Improve Ventilation and Weatherproofness



Information When Estimating or Ordering Penglass Ventilator

Round Ventilator: What material required. If Bases are needed — Standard or Oversize; Pitch of Roof; What Roof Material. If base for 36" Ventilator or over, recommend extra Roof Supports (to be furnished by customer).

If Dampers are needed — Which type; how much extra chain over 4 feet is required; any pulleys or clips.

Fan Ventilators: Motor information required; voltage; phase; cycle; D.C. or A.C. If temperature of exhaust fumes is over 105° F., an extra for Class B Insulation of Motor is required up to 150° F.

Ridge Ventilator: Pitch of Roof; Roof Material; Extra double chain for damper over 10 feet. In long Ridge

Ventilators if any expansion joints are required, there will be an extra charge for ends. In this case see home office.

Screens: Bird Screens can be easily installed over the exhaust area of both Round and Ridge Ventilators.

Blue Prints: Secure Blue Prints from steel fabricators and roofing contractors as soon as possible. It expedites furnishing steel fabricators with necessary steel punching.

Approval: We require approval of prints before fabrication.

Freight: Both the B. & O. and P. R. R. service our plant.

FAN VENTILATOR DATA

Ventilator Size	Fan Size Collar V-Belt	Fan R.P.M. Collar V-Belt	Motor Characteristics				Height of Collar	* Capacity c.f.p.m.
			H.P.	Voltage	Phase	Cycle		
†12"	9"	†1600	1/20	110 or 220	1	60	12"	490
†16"	14"	†1140	1/20	110 or 220	1	60	17"	1205
†16"	14"	†1425	1/8	110 or 220	1	25	17"	1520
†16"	14"	†1725	1/8	110 or 220	1	60	17"	1830
†20"	18"	†1725	1/4	110 or 220	1	60	17"	3135
†20"	18"	†1425	1/4	110 or 220	1	25	17"	2620
24"	20"	1725	1/2	220 or 440	3	60	17"	4665
24"	22"	1425	1/2	220 or 440	3	25	17"	4950
24"	22"	1725	3/4	220 or 440	3	60	17"	5980
36"	32"	720	1/4	110 or 220	3	25	17"	7490
36"	32"	1150	1	220 and 440	3	60	17"	11955
48"	42"	850	1 1/2	220 and 440	3	60	24"	19600
48"	42"	720	1	220 and 440	3	25	24"	16610
48"	44"	850	5	220 and 440	3	60	24"	27730
54"	48"	850	7 1/2	220 and 440	3	60	24"	35870
54"	50"	690	5	220 and 440	3	60	24"	33025
54"	50"	720	5	220 and 440	3	25	24"	34495
60"	54"	690	7 1/2	220 and 440	3	60	24"	41550
60"	56"	690	7 1/2	220 and 440	3	60	24"	46305
60"	54"	720	7 1/2	220 and 440	3	25	24"	43365
72"	66"	575	10	220 and 440	3	60	24"	62820
72"	66"	475	7 1/2	220 and 440	3	25	24"	51890
84"	72"	475	10	220 and 440	3	25	24"	67425
84"	72"	575	15	220 and 440	3	60	24"	81635

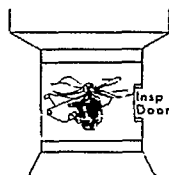
*This capacity is figured on the average static pressure in the ventilator plus 5 miles wind action. The above table is based on the most efficient combination of high speed motors of economical H.P. and rated capacities for industrial installation. Where 4000' or less tip speed (silent) is required, consult the home office.

Motors for Collar Type have same speed as R.P.M. of Fan. Motor speeds for V-Belt Type are 1725 R.P.M. for 60 cycle and 1425 R.P.M. for 25 cycle, with pulley to reduce to those of fan speed shown in table.

†No V-Belt Type furnished for these sizes.

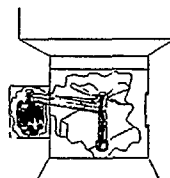
Tip Speed — Circumference of fan × R.P.M. of fan.

Collar Type Fan Ventilator



Used in most places where fan power is required. Simple and strongly designed fan and motor supporting frame. Inspection door in collar

V-Belt Type Fan Ventilator



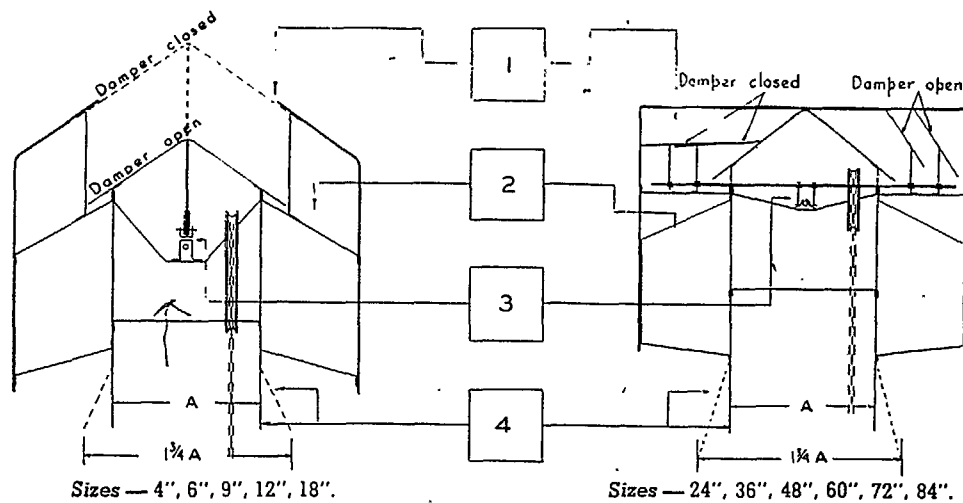
Especially recommended for corrosive, excessive heat and high humidity installation. Readily accessible for maintenance and inspection.

Explosion proof motors can be furnished for both types of fan ventilator at an extra charge.

Fractional horse power motors are 110 or 220 voltage.

One horse power, and over, motor can be 220 and 440 voltage.

"THE RELIEF" RIDGE VENTILATOR

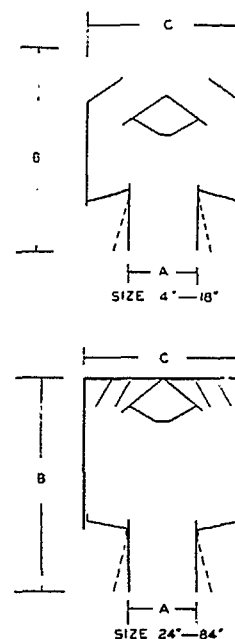


1. When ventilator damper is in closed position, dirt and snow are kept outside its structure.
2. Unrestricted air flow to exhaust.
3. Damper tension operator out of way — can be totally enclosed if exhaust fumes are corrosive.
4. To improve ventilation of Ridge Type, lower framework is fitted to any roof having $1\frac{3}{4} \times A$ (stack) opening. This is standard equipment for small sizes.

RIDGE VENTILATORS—DIMENSIONS—WEIGHTS—GAUGES

Dimensions in inches			Approx. Weights per Lineal Foot				Gauges
Size A	B	C	Net		Shipping		Galv. A.P.M. or A.P.S.
			Galv.	A.P.M. or A.P.S.	Galv.	A.P.M. or A.P.S.	
4"	7	8	7		11		24
6"	12	14	11	15	20	24	24
9"	19	22	16	21	27	32	24
12"	26	28	22	26	36	40	24
18"	38	42	33	43	49	56	24
*24"	45	53	40	47	75	83	22
*36"	65	78	55	70	119	134	22
*48"	88	105	70	89	135	154	22
*60"	110	130	87	109	148	180	22
*72"	125	158	98	126	172	208	22
*84"	149	180	125	160	197	236	22

* Shipped knocked down.



PERFORMANCE TABLE OF RIDGE VENTILATORS

(Figures are all in Lineal Feet Velocity per m.)

Stack height above inlet	WIND—five miles per hour			
	Temperature Difference in F.			
	5°	10°	20°	30°
10 ft.	188 L.ft.p.m.	218 L.ft.p.m.	264 L.ft.p.m.	302 L.ft.p.m.
20 ft.	218 L.ft.p.m.	260 L.ft.p.m.	329 L.ft.p.m.	378 L.ft.p.m.
30 ft.	242 L.ft.p.m.	297 L.ft.p.m.	376 L.ft.p.m.	442 L.ft.p.m.
40 ft.	262 L.ft.p.m.	328 L.ft.p.m.	420 L.ft.p.m.	493 L.ft.p.m.
50 ft.	280 L.ft.p.m.	352 L.ft.p.m.	456 L.ft.p.m.	538 L.ft.p.m.

In the exhaust table we have taken the outside wind velocity at an average of five miles per hour to simplify the use in figuring capacities of Ridge Ventilators.

DAMPER OPERATOR TENSION TYPE

One Hand Chain Operator
for 100 Feet Damper Length.
Motor Power can be used at
extra cost.

IMPORTANT: Building to have proper air inlet. We recommend 2 times inlet area over outlet area.

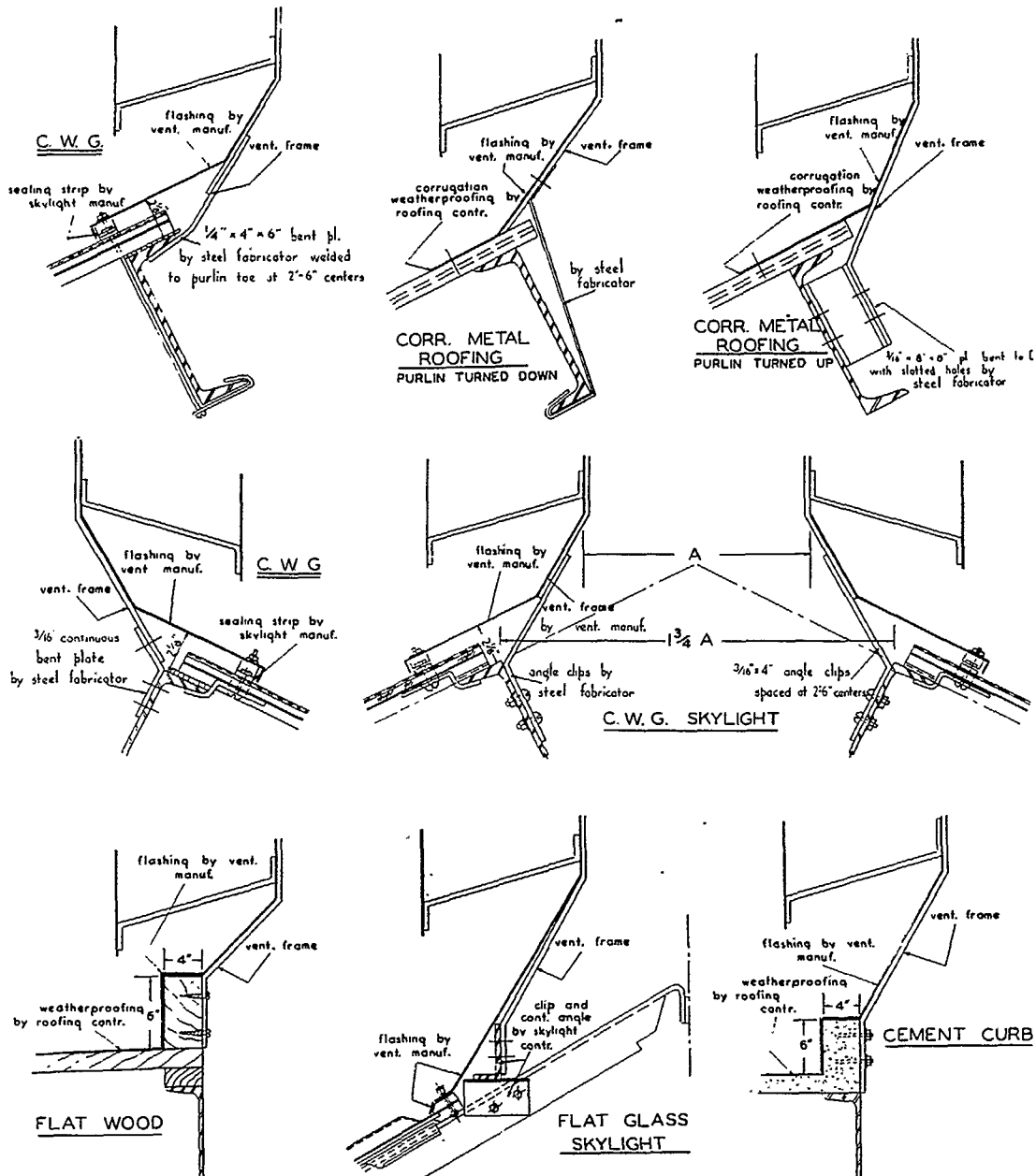
Example:

1. Building 50' (width) × 250' (length) × 40' (height) = 500,000 c.f.
2. Five air changes.
3. $500,000 \times 5 \div 60 = 41,666$ c.f.p.m.
4. 10° F. Temp. Difference — 40' Stack Height — 5 m. p. h. wind. Above table gives 328 L.ft. p.m.
5. To exhaust 41,666 c.f.p.m. at 328 L.ft. p.m., roof opening must be 127 sq. ft.
6. We recommend one ventilator 200' long, with a total opening of 127 sq. ft. This will give a ventilator size $127 \div 200 = .64'$.
7. The nearest standard size ridge vent is .75' or 9".

RIDGE VENTILATOR

RECOMMENDATIONS FOR BASE CONNECTIONS

To Improve Ventilation and Weatherproofness



AIR CHANGES RECOMMENDED

Type of Building	Air Changes per Hour	Type of Building	Air Changes per Hour
Agriculture:		Steel Industry:	
Horse Barns	4296 cf/hr per horse	Main Mill Bldg.	5-10
Cow Barns	3542 cf/hr per cow	Slab Furnace Sect.	30
Chicken House	4	Coil Transfer Bldg.	115
Brooder House	2	Annealing Bldg.	30-50
Hog House	6	Mesta Pickling	60-80
Foundry Industry:		Cont. Pickling	5-10
Electric Furnace	(Baffles) 150-200	Roll Shop	2
Pouring Section	30-35	Warehouse	1
Shakeout Section	Suction Equip.	Galvanizing	(Hood) 75-150
Core Oven Rooms	40-50	Machine Room	4-6
Cupola Section	30-35		
Forge Shop:		Utility:	
Furnace & Hammer Building	30-40	Boiler House	Special 65-above boiler
Heat Treating Sect.	60-120	Motor Room	Based on total K.W. Equipment
Food Industry:		Turbine Room	5-10
Vegetable Kettles	Based on steam evaporation		
Pressure Cookers	100-120	Miscellaneous:	
Paper Industry:		Dye House	Hood 30
Machine Room	Based on Tonnage 20-30	Glass Furnace Bldg.	100-150
Wet End Section	20	Laundry	20-30
Beater Room	30	Lavatories	15
Digester Bldg.	30-40	Packing House	10-15

In several industries it is necessary before the correct air changes can be recommended that actual operating data is secured. Our ventilator engineers are ready to assist you any time in obtaining the required information without any obligation.

USEFUL INFORMATION

$$\text{Area of a Circle} = \pi \frac{D^2}{4} = .7854 \times D^2.$$

$$\text{Circumference} = D \times 3.1416.$$

$$\text{Natural Gas} = 1000 \text{ B.T.U. per cf.}$$

$$\text{Manufactured Gas} = 500 \text{ B.T.U. per cf.}$$

$$\text{Blast Furnace Gas} = 100 \text{ B.T.U. per cf.}$$

$$\text{Fuel Oil} = 145,000 \text{ B.T.U. per gal.}$$

$$\text{Coal} = 12,000 \text{ B.T.U. per lb.}$$

$$\text{Fahrenheit} = 9/5 \text{ Cent.} + 32.$$

$$\text{Cent.} = 5/9 \text{ F.} - 32.$$

$$1 \text{ lb. per sq. in.} = 144 \text{ lbs. per sq. ft.}$$

$$1 \text{ Mile per Hour} = 5280 \text{ ft. p.h.} = 88 \text{ ft. p.m.}$$

$$1/2 \text{ Pitch Roof} = 12'' \text{ in } 12'' \text{ Rise.}$$

$$1/3 \text{ Pitch Roof} = 8'' \text{ in } 12'' \text{ Rise.}$$

$$1/4 \text{ Pitch Roof} = 6'' \text{ in } 12'' \text{ Rise.}$$

$$1.5 \text{ Pitch Roof} = 4-4/5'' \text{ in } 12'' \text{ Rise.}$$

$$1 \text{ H.P.} = .746 \text{ Kilowatt.}$$

$$1 \text{ K.W.} = 1.34 \text{ H.P.}$$

$$1 \text{ H.P.} = 33,000 \text{ foot pounds.}$$

$$80 \text{ Mile Wind} = 31.49 \text{ lbs. per sq. ft.}$$

$$\text{Sulphuric Acid boils at } 590^\circ \text{ F.}$$

$$\text{Nitric Acid boils at } 242^\circ \text{ F.}$$

$$\text{Steel Melting Point, } 2600^\circ \text{ F.}$$

$$\text{Cast Iron Melting Point, } 2200^\circ \text{ F.}$$

**PENGLASS
VENTILATORS**

WILL

WELL

PENNSYLVANIA WIRE

MARKET ST., PHILA., PA.

Printed in U. S. A.

USHO 003411

**PENGLASS
VENTILATORS**

PENNSYLVANIA WIRE GLASS COMPANY
1612 MARKET STREET
PHILADELPHIA, PENNSYLVANIA

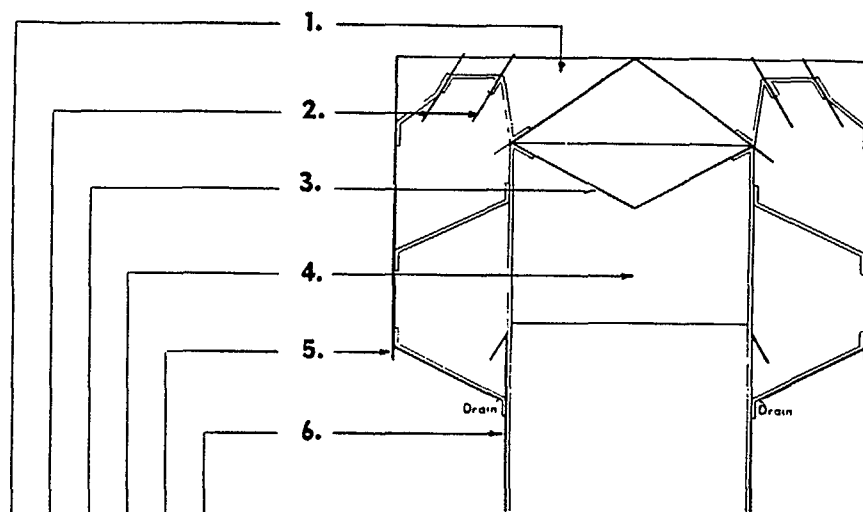
USHO 003412

The PENGLOSS Stationary Types of Roof Ventilators are manufactured to meet the ever increasing demand for more efficient ventilation and to combine a Ventilating Recommendation Service (without obligation) which reflects the old established company policy of helpfulness, in the interest of plant management, labor and government.

FRANK L. MARTIN,
President.

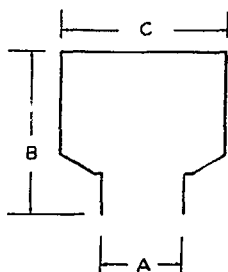
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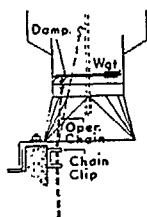
1. A single air outlet over three times the stack area.
2. Accelerator Baffles converting additional suction power of the passing wind. Protection for weather-proofness.
3. Special designed Cap Cone furnishes the animated flue effect.
4. An unobstructed Expansion Chamber produces the constant flow of air to the exhaust.
5. The Wind Accumulator Band with specific economical dimensions, produces maximum air movement at the minimum area displacement.
6. Stationary type having a balanced framework withstanding an eighty mile wind.

ROUND VENTILATORS—DIMENSIONS—WEIGHTS—GAUGES

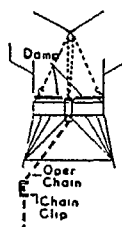


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*54"	92	102	790 lb.	962 lb.	1254 lb.	1613 lb.	20
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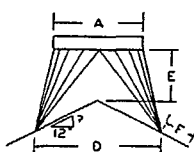
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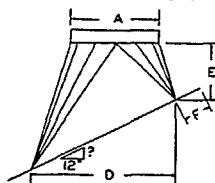
Standard Flat Damper for round ventilators is counter-weighted to keep in open position—a chain clip is furnished to hold damper closed—four feet of chain are furnished with each damper. . . .



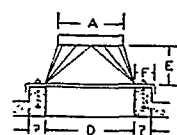
Butterfly Damper is used in ventilators over all electric power houses, on food products buildings and on other establishments where a tight fit damper is required. . . .



TYPE NO. 1
FOR RIDGE ROOFS



TYPE NO. 3
FOR SLOPING ROOFS



TYPE NO. 6
FOR CURBS

STANDARD BASES—DIMENSIONS—WEIGHTS—GAUGES

Dimensions, Inches				Approx. Net Wt. Lb.		Approx. Shipping Wt. Lb.		Gauges
Size A	Size D	Size E	Size F	Galv.	A.P.M. A.P.S.	Galv.	A.P.M. A.P.S.	Galv. A.P.M. or A.P.S.
12"	16x18	10	4"	12	16	58	64	22
16"	21x21	10	4"	25	30	66	77	22
20"	28x28	10	5"	45	55	98	111	22
24"	32x32	10	5"	55	75	106	120	22
36"	45x45	14	6"	110	140	173	200	20
*48"	60x60	**15	6"	140	230	432	495	18
*54"	68x68	**16	6"	240	300	542	618	18
*60"	78x78	**20	6"	300	380	539	627	18
*72"	96x96	**24	6"	460	580	841	988	18
*84"	110x110	**26	9"	660	770	1090	1221	16

* Ventilator base shipped in two pieces.

** Dimension E for Type No. 6 Bases, 48 in. and larger, is one-half of Dimension A.

① Roof Opening. 1" less—each dimension.

HOW TO USE ROUND VENTILATOR CAPACITY TABLES

1. Estimate approximately the cubical contents of building — the total volume of air in cubic feet.
2. Determine the number of air changes per hour required. See page 9.
3. Multiply the cubical contents by the number of air changes to be exhausted per hour. Divide this total by 60 to get the volume per minute.
4. Decide the number of ventilators to be used. Usually one ventilator per bay (where bays are 15-20 ft. in length) is advisable.
5. Divide the volume of air per minute (see No. 3) by the number of ventilators. Result — cubic feet of air to be exhausted per ventilator.
6. Three variable factors enter in the final selection of the proper size ventilator (1) Wind velocity (to simplify and expedite figuring, we have chosen for our capacity table an average of five miles per hour); (2) Inside and outside temperature difference in degrees F.; (3) Height of ventilator above intake (called stack height).

Example:

1. Building 60' (width) $\times$ 200' (length) $\times$ 40' (height) = 480,000 cubic feet.
2. 6 air changes —
3. $480,000 \times 6 \div 60 = 48,000$ cubic feet per minute.
4. 10 ventilators.
5. $48,000 \div 10 = 4,800$ c.f.m. for each vent.
6. 5° F. Temp. Difference — 40' stack height — 5 m.p.h. wind — size of each vent 54".

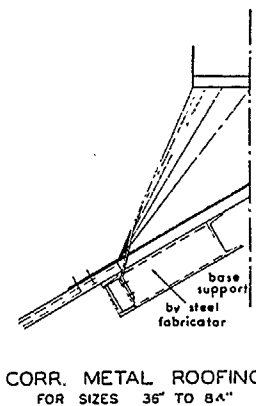
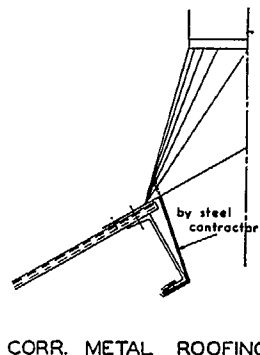
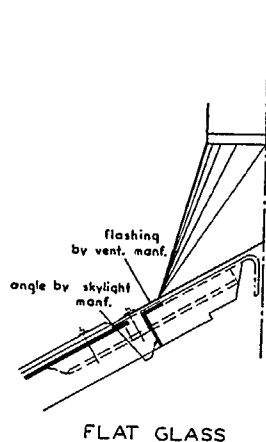
Vent Size	Stack Height in Feet	Wind Velocity 5 miles per hour				Vent Size	Stack Height in Feet	Wind Velocity 5 miles per hour			
		Temperature Difference in F.						Temperature Difference in F.			
		5	10	20	30			5	10	20	30
12" .785 sq. ft.	10	182	205	241	271	48" 12.56 sq. ft.	10	2901	3275	3850	4325
	20	205	238	292	331		20	3275	3802	4662	5275
	30	224	267	329	381		30	3575	4262	5250	6075
	40	240	292	364	421		40	3825	4650	5891	6712
	50	254	310	392	456		50	4050	4950	6250	7275
16" 1.39 sq. ft.	10	322	364	428	480	54" 15.9 sq. ft.	10	3712	4192	4928	5536
	20	364	422	518	586		20	4192	4864	5968	6752
	30	397	473	583	675		30	4576	5456	6720	7776
	40	425	517	644	746		40	4836	5952	7424	8592
	50	450	550	695	808		50	5184	6336	8001	9312
20" 2.18 sq. ft.	10	510	576	677	739	60" 19.6 sq. ft.	10	4547	5135	6038	6781
	20	576	668	820	928		20	5135	5958	7310	8271
	30	629	750	924	1069		30	5605	6683	8232	9525
	40	673	818	1020	1181		40	5997	7291	9094	10525
	50	712	871	1100	1280		50	6350	7761	9801	11407
24" 3.14 sq. ft.	10	728	822	967	1088	72" 28.27 sq. ft.	10	8565	7414	8716	9791
	20	822	954	1171	1325		20	7414	8603	10555	11942
	30	898	1070	1318	1526		30	8093	9650	11886	13753
	40	960	1168	1456	1686		40	8659	10527	13131	15197
	50	1017	1243	1470	1827		50	9169	11206	14150	16470
36" 7.06 sq. ft.	10	1637	1849	2174	2442	84" 38.48 sq. ft.	10	8908	10060	11827	13286
	20	1849	2146	2633	2979		20	10060	11673	14323	16204
	30	2019	2407	2965	3431		30	10982	13094	16128	18662
	40	2160	2626	3275	3791		40	11750	14284	17817	20620
	50	2287	2795	3530	4108		50	12441	15206	19200	22348

IMPORTANT: Capacity table based on building having proper air inlets. Minimum — Inlet area equal to exhaust area. We recommend 2 X inlet area over outlet area.

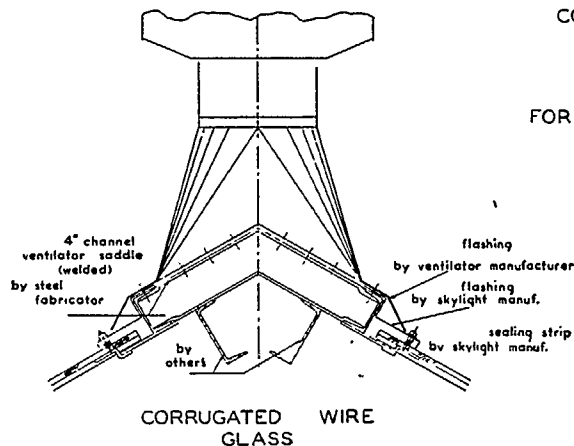
ROUND VENTILATOR

RECOMMENDATIONS FOR BASE CONNECTIONS

To Improve Ventilation and Weatherproofness



FOR ADDITIONAL BASE
CONNECTIONS
SEE PAGE 6



Information When Estimating or Ordering Penglass Ventilator

Round Ventilator: What material required. If Bases are needed — Standard or Oversize; Pitch of Roof; What Roof Material. If base for 36" Ventilator or over, recommend extra Roof Supports (to be furnished by customer).

If Dampers are needed — Which type; how much extra chain over 4 feet is required; any pulleys or clips.

Fan Ventilators: Motor information required; voltage; phase; cycle; D.C. or A.C. If temperature of exhaust fumes is over 105° F., an extra for Class B Insulation of Motor is required up to 150° F.

Ridge Ventilator: Pitch of Roof; Roof Material; Extra double chain for damper over 10 feet. In long

Ridge Ventilators if any expansion joints are required, there will be an extra charge for ends. In this case see home office.

Screens: Bird Screens can be easily installed over the exhaust area of both Round and Ridge Ventilators.

Blue Prints: Secure Blue Prints from steel fabricators and roofing contractors as soon as possible. It expedites furnishing steel fabricators with necessary steel punching.

Approval: We require approval of prints before fabrication.

Freight: Both the B. & O. and P. R. R. service our plant.

FAN VENTILATOR DATA

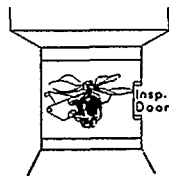
Ventilator Size	Fan Size Collar V-Belt	Fan R.P.M. Collar V-Belt	Motor Characteristics				Height of Collar	Capacity c.f.p.m.
			H.P.	Voltage	Phase	Cycle		
†12"	9"	†1800	1/20	110 or 220	1	60	12"	490
†16"	14"	†1140	1/20	110 or 220	1	60	17"	1205
†16"	14"	†1425	¼	110 or 220	1	25	17"	1520
†16"	14"	†1725	¼	110 or 220	1	60	17"	1830
†20"	18"	†1725	¼	110 or 220	1	60	17"	3135
†20"	18"	†1425	¼	110 or 220	1	25	17"	2620
24"	20"	1725	½	220 or 440	3	60	17"	4665
24"	22"	1425	½	220 or 440	3	25	17"	4950
24"	22"	1725	¾	220 or 440	3	60	17"	5980
36"	32"	720	¾	110 or 220	3	25	17"	7490
36"	32"	1150	1	220 and 440	3	60	17"	11955
48"	42"	850	1½	220 and 440	3	60	24"	19600
48"	42"	720	1	220 and 440	3	25	24"	16610
48"	44"	850	5	220 and 440	3	60	24"	27730
54"	48"	850	7½	220 and 440	3	60	24"	35870
54"	50"	690	5	220 and 440	3	60	24"	33025
54"	50"	720	5	220 and 440	3	25	24"	34495
60"	54"	690	7½	220 and 440	3	60	24"	41550
60"	56"	690	7½	220 and 440	3	60	24"	46305
60"	54"	720	7½	220 and 440	3	25	24"	43365
72"	66"	575	10	220 and 440	3	60	24"	62820
72"	66"	475	7½	220 and 440	3	25	24"	51890
84"	72"	475	10	220 and 440	3	25	24"	67425
84"	72"	575	15	220 and 440	3	60	24"	81635

*This capacity is figured on the average static pressure in the ventilator plus 5 miles wind action. The above table is based on the most efficient combination of high speed motors of economical H.P. and rated capacities for industrial installation. Where 4000' or less tip speed (silent) is required, consult the

home office. Motors for Collar Type have same speed as R.P.M. of Fan. Motor speeds for V-Belt Type are 1725 R.P.M. for 60 cycle and 1425 R.P.M. for 25 cycle, with pulley to reduce to those of fan speed shown in table. †No V-Belt Type furnished for these sizes.

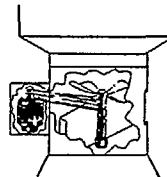
Tip Speed — Circumference of fan × R.P.M. of fan.

Collar Type Fan Ventilator



Used in most places where fan power is required. Simple and strongly designed fan and motor supporting frame. Inspection door in collar.

V-Belt Type Fan Ventilator



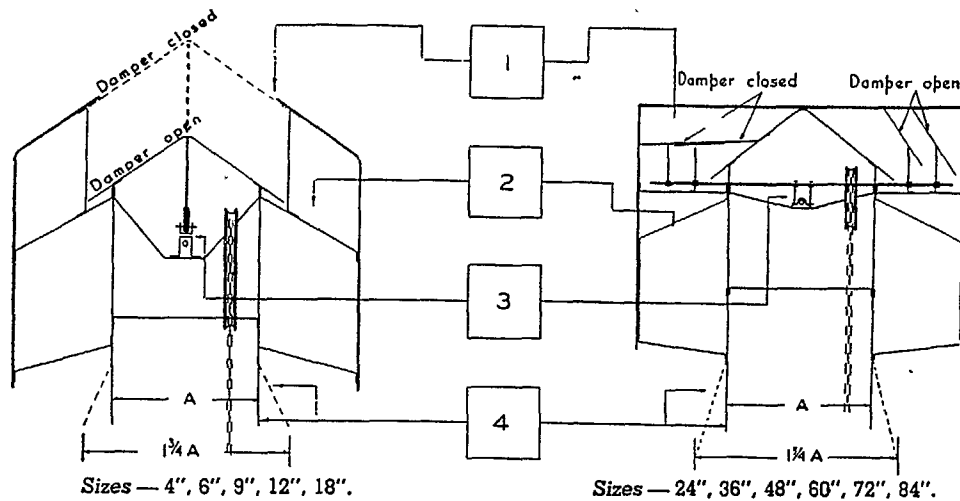
Especially recommended for corrosive, excessive heat and high humidity installation. Readily accessible for maintenance and inspection.

Explosion proof motors can be furnished for both types of fan ventilator at an extra charge.

Fractional horse power motors are 110 or 220 voltage.

One horse power, and over, motor can be 220 and 440 voltage.

"THE RELIEF" RIDGE VENTILATOR

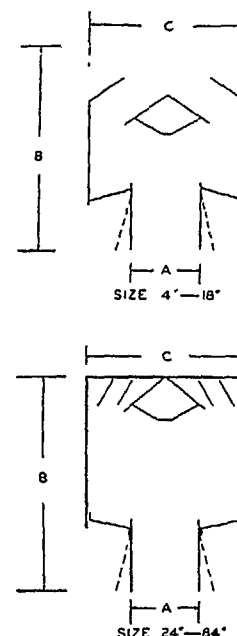


1. When ventilator damper is in closed position, dirt and snow are kept outside its structure.
2. Unrestricted air flow to exhaust.
3. Damper tension operator out of way—can be totally enclosed if exhaust fumes are corrosive.
4. To improve ventilation of Ridge Type, lower framework is fitted to any roof having $1\frac{1}{4} \times A$ (stack) opening. This is standard equipment for small sizes.

RIDGE VENTILATORS—DIMENSIONS—WEIGHTS—GAUGES

Dimensions in inches			Approx. Weights per Lineal Foot				Gauges Galv. A.P.M. or A.P.S.
Size A	B	C	Net		Shipping		
			Galv.	A.P.M. or A.P.S.	Galv.	A.P.M. or A.P.S.	
4"	7	8	7		11		24
6"	12	14	11	15	20	24	24
9"	19	22	16	21	27	32	24
12"	26	28	22	26	36	40	24
18"	38	42	33	43	49	56	24
*24"	45	53	40	47	75	83	22
*36"	65	78	55	70	119	134	22
*48"	88	105	70	89	135	154	22
*60"	110	130	87	109	148	180	22
*72"	125	158	98	126	172	208	22
*84"	149	180	125	160	197	236	22

* Shipped knocked down.



PERFORMANCE TABLE OF RIDGE VENTILATORS

(Figures are all in Lineal Feet Velocity per m.)

Stack height above inlet	WIND—five miles per hour			
	Temperature Difference in F.			
	5°	10°	20°	30°
10 ft.	188 L.ft.p.m.	218 L.ft.p.m.	264 L.ft.p.m.	302 L.ft.p.m.
20 ft.	218 L.ft.p.m.	260 L.ft.p.m.	329 L.ft.p.m.	378 L.ft.p.m.
30 ft.	242 L.ft.p.m.	297 L.ft.p.m.	376 L.ft.p.m.	442 L.ft.p.m.
40 ft.	262 L.ft.p.m.	323 L.ft.p.m.	420 L.ft.p.m.	493 L.ft.p.m.
50 ft.	280 L.ft.p.m.	352 L.ft.p.m.	456 L.ft.p.m.	538 L.ft.p.m.

In the exhaust table we have taken the outside wind velocity at an average of five miles per hour to simplify the use in figuring capacities of Ridge Ventilators.

DAMPER OPERATOR TENSION TYPE

One Hand Chain Operator for 100 Feet Damper Length. Motor Power can be used at extra cost.

IMPORTANT: Building to have proper air inlet. We recommend 2 times inlet area over outlet area.

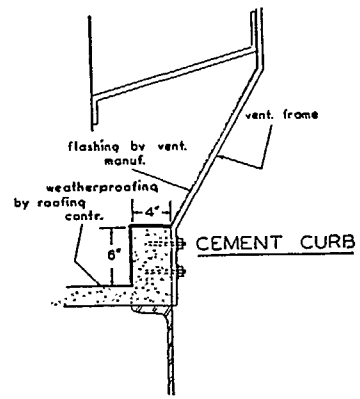
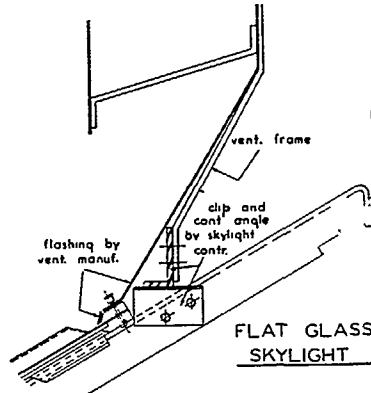
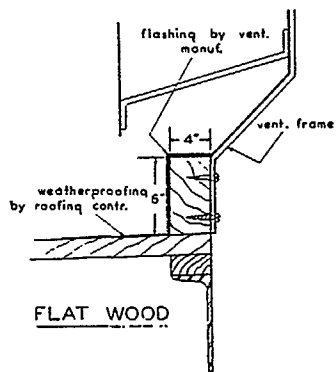
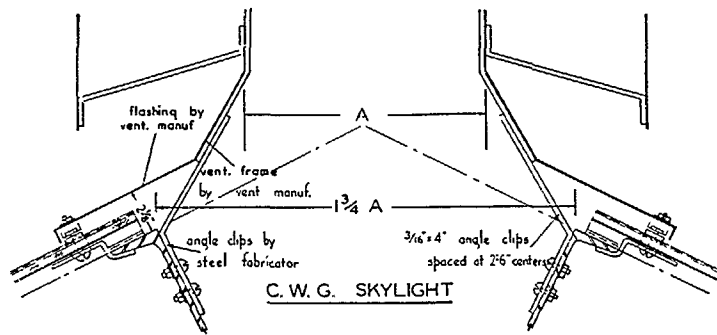
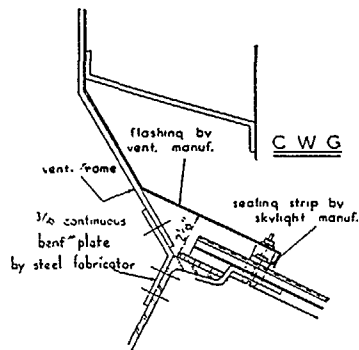
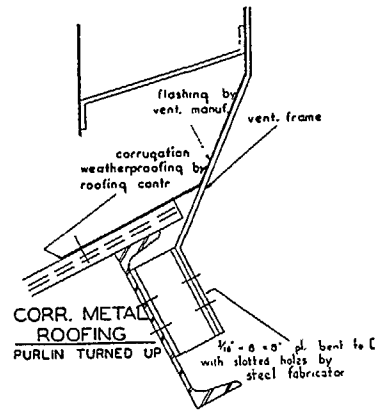
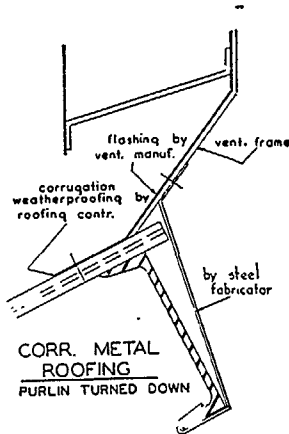
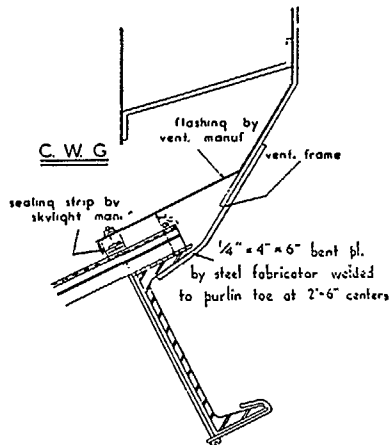
Example:

1. Building 50' (width) $\times$ 250' (length) $\times$ 40' (height) = 500,000 c.f.
2. Five air changes.
3. $500,000 \times 5 \div 60 = 41,666$ c.f.p.m.
4. 10° F. Temp. Difference — 40' Stack Height — 5 m. p. h. wind. Above table gives 328 L.ft.p.m.
5. To exhaust 41,666 c.f.p.m. at 328 L.ft.p.m., roof opening must be 127 sq. ft.
6. We recommend one ventilator 200' long, with a total opening of 127 sq. ft. This will give a ventilator size $127 \div 200 = .64'$.
7. The nearest standard size ridge vent is .75' or 9".

RIDGE VENTILATOR

RECOMMENDATIONS FOR BASE CONNECTIONS

To Improve Ventilation and Weatherproofness



AIR CHANGES RECOMMENDED

Type of Building	Air Changes per Hour	Type of Building	Air Changes per Hour
Agriculture:		Steel Industry:	
Horse Barns	4296 cf/hr per horse	Main Mill Bldg.	5-10
Cow Barns	3542 cf/hr per Cow	Slab Furnace Sect.	30
Chicken House	4	Coil Transfer Bldg.	115
Brooder House	2	Annealing Bldg.	30-50
Hog House	6	Mesta Pickling	60-80
Foundry Industry:		Cont. Pickling	5-10
Electric Furnace	(Baffles) 150-200	Roll Shop	2
Pouring Section	30-35	Warehouse	1
Shakeout Section	Suction Equip.	Galvanizing	(Hood) 75-150
Core Oven Rooms	40-50	Machine Room	4-6
Cupola Section	30-35		
Forge Shop:		Utility:	
Furnace & Hammer Building	30-40	Boiler House	Special
Heat Treating Sect.	60-120	Motor Room	65-above boiler
Food Industry:		Turbine Room	Based on total K.W. Equipment
Vegetable Kettles	Based on steam evaporation		5-10
Pressure Cookers	100-120	Miscellaneous:	
Paper Industry:		Dye House	Hood 30
Machine Room	Based on Tonnage	Glass Furnace Bldg.	100-150
Wet End Section	20-30	Laundry	20-30
Beater Room	20	Lavatories	15
Digester Bldg.	30	Packing House	10-15
	30-40		

In several industries it is necessary before the correct air changes can be recommended that actual operating data is secured. Our ventilator engineers are ready to assist you any time in obtaining the required information without any obligation.

USEFUL INFORMATION

$$\text{Area of a Circle} = \pi \frac{D^2}{4} = .7854 \times D^2.$$

$$\text{Circumference} = D \times 3.1416.$$

$$\text{Natural Gas} = 1000 \text{ B.T.U. per cf.}$$

$$\text{Manufactured Gas} = 500 \text{ B.T.U. per cf.}$$

$$\text{Blast Furnace Gas} = 100 \text{ B.T.U. per cf.}$$

$$\text{Fuel Oil} = 145,000 \text{ B.T.U. per gal.}$$

$$\text{Coal} = 12,000 \text{ B.T.U. per lb.}$$

$$\text{Fahrenheit} = 9/5 \text{ Cent.} + 32.$$

$$\text{Cent.} = 5/9 \text{ F.} - 32.$$

$$1 \text{ lb. per sq. in.} = 144 \text{ lbs. per sq. ft.}$$

$$1 \text{ Mile per Hour} = 5280 \text{ ft. p.h.} = 88 \text{ ft. p.m.}$$

$$1/2 \text{ Pitch Roof} = 12'' \text{ in } 12'' \text{ Rise.}$$

$$1/3 \text{ Pitch Roof} = 8'' \text{ in } 12'' \text{ Rise.}$$

$$1/4 \text{ Pitch Roof} = 6'' \text{ in } 12'' \text{ Rise.}$$

$$1/5 \text{ Pitch Roof} = 4\text{--}4/5'' \text{ in } 12'' \text{ Rise.}$$

$$1 \text{ H.P.} = .746 \text{ Kilowatt.}$$

$$1 \text{ K.W.} = 1.34 \text{ H.P.}$$

$$1 \text{ H.P.} = 3,000 \text{ foot pounds.}$$

$$80 \text{ Mile Wind} = 31.49 \text{ lbs. per sq. ft.}$$

$$\text{Sulphuric Acid boils at } 590^\circ \text{ F.}$$

$$\text{Nitric Acid boils at } 242^\circ \text{ F.}$$

$$\text{Steel Melting Point, } 2600^\circ \text{ F.}$$

$$\text{Cast Iron Melting Point, } 2200^\circ \text{ F.}$$

**PENGLASS
VENTILATORS**

WILL

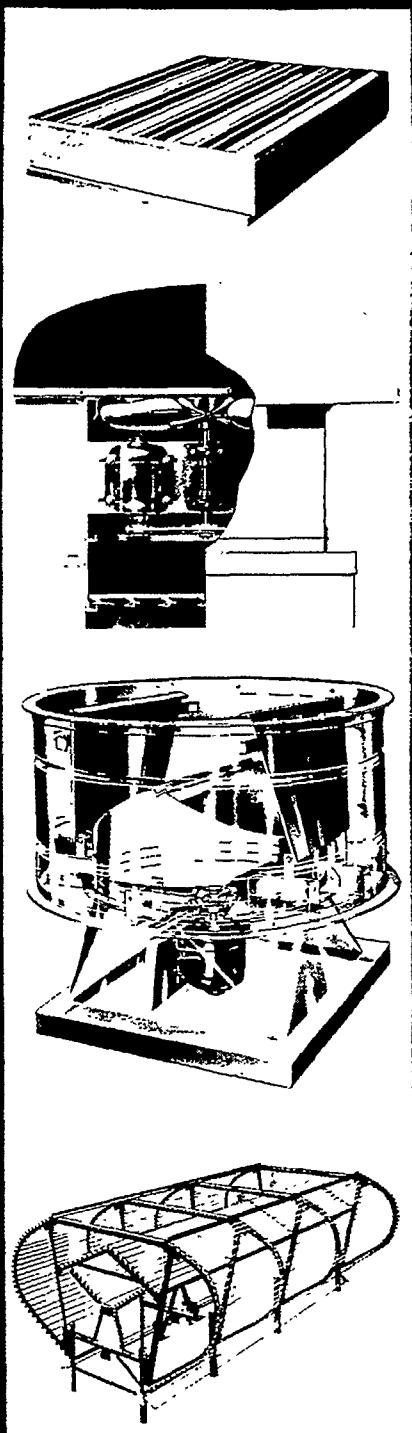
WELL

PENNSYLVANIA WIRE CO. MARKET ST. • PHILA., PA.

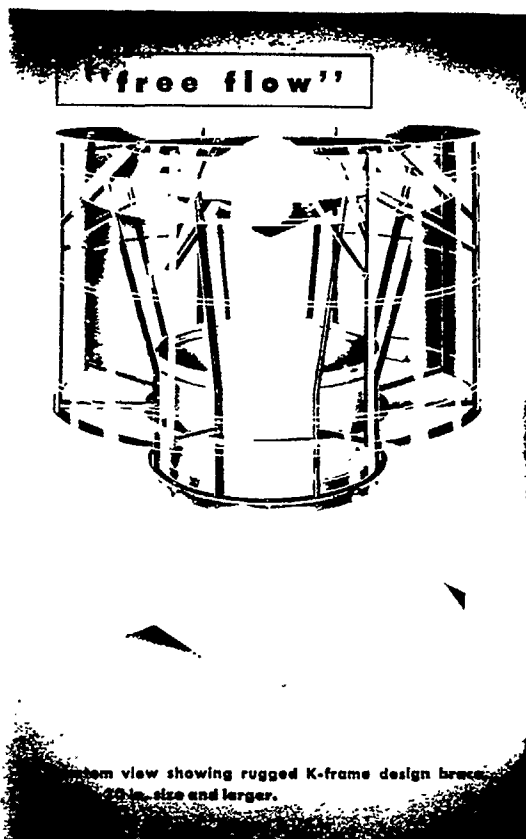
Printed in U.S.A.

USHO 003423

Burt



round type ventilators



The Burt "Free-Flow" Gravity Ventilator, by virtue of simple design and principle of Air Flow provides greater capacities with economy and efficiency, offering the advantage that fewer units are required for ample ventilation. It can be best described as the "super-capacity" gravity ventilator.

Notice in the sectional view that the entire discharge from the ventilator is vertically upward. Note also the absence of internal louvres which would tend to impede the free flow of air through the ventilator. Friction loss occurring in the ventilator head has been reduced to absolute minimum. Being free of all moving parts its construction is simpler and offers no service problem whatever.

performance and dimension data

Cap., C.F.M.**	669	911	1192	1504	1844	2619	4036	5688	7591	9763	11996	14373	17035	19590	24820	29750
Sizes, Inches	12	14	16	18	20	24	30	36	42	48	54	60	66	72	84	96
Over-all Diam., Ins.	22 $\frac{3}{4}$	26 $\frac{3}{8}$	30 $\frac{3}{8}$	34 $\frac{1}{2}$	37 $\frac{3}{8}$	45 $\frac{1}{8}$	57	68 $\frac{3}{8}$	79 $\frac{1}{4}$	91 $\frac{1}{4}$	102 $\frac{3}{8}$	114	125 $\frac{3}{8}$	136 $\frac{3}{8}$	159 $\frac{3}{8}$	182 $\frac{3}{8}$
Over-all Ht., Ins.	20 $\frac{1}{2}$	22 $\frac{1}{2}$	27 $\frac{1}{2}$	29 $\frac{1}{2}$	31 $\frac{1}{2}$	38 $\frac{1}{2}$	47 $\frac{1}{2}$	53 $\frac{1}{2}$	59 $\frac{1}{2}$	65 $\frac{1}{2}$	74 $\frac{1}{2}$	83 $\frac{1}{2}$	88 $\frac{1}{2}$	101 $\frac{1}{2}$	113 $\frac{1}{2}$	131 $\frac{1}{2}$
Galv. or A.P.M.Ga.	24	24	24	22	22	22	20	20	20-18	20-18	20-18	18-16	18-16	18-16	18-16	18-16
Copper, Oz.	16	16	16	18	18	18-20	20-24	20-24	20-24	20-24	24-28	.....	.....	.....	.....	.....
Aluminum, B & S Ga.	22	22	22	20	20	20	18	18	18-16	18-16	18-16	16-14	16-14	16-14	16-14	16-14
Net Wt., lbs. (Galv.)	21	28	36	57	69	104	202	310	415	540	705	1105	1330	1635	2300	3245

*Exclusive of base. **Temperature difference 20°F., stack height, 40 ft., wind velocity 10 m.p.h.
Where two gauges are shown, heavier is for air shaft only.

Design and Structural Features

1. Upward Vertical Discharge prevents loss of energy, reduction of velocity and discharge due to sudden changes of air direction. Eliminates condensation below and consequently deterioration of roofing material.
2. Free Discharge Area constantly increasing within ventilator head assures unrestricted passage of air.
3. Upper Airflow Baffle, between top and windband renders unit stormproof and prevents back-drafts without retarding air flow.
4. Lower Airflow Baffle effectively prevents discharge of air beneath windband, renders unit stormproof and aids in creating suction. Drain opening between air shaft and baffle permits passage of rain, snow, or trash.
5. Airflow Director Cone eliminates trap, prevents turbulence and provides easy egress for air.
6. Unusually Large Windband creates extremely low pressure area, causes greater suction effect from passing winds with increasing greater capacity.
7. Burt "K-Frame" Design Braces. Sizes 30" and larger are provided with the Burt "K-Frame" design braces each of which is fabricated from angle and welded to make a one piece rigid structure of exceptional strength. The K-Frame ties together all ventilator head parts and transmits all load directly down through angle legs to angle ring connections at base. This K-Frame angle brace design simplifies erection to a minimum.
8. For sizes 24" and smaller, braces are heavy bar of ample size for rigid construction.
9. Heavy Swedges in windband and airshaft give additional stiffness and strength.
10. Angle Rings are provided on bottom of airshafts and top of bases for all sizes 30" and larger for additional strength and simpler erection.
11. Metal Gauges are proportioned to assure rigidity, strength and endurance and to give more than sufficient strength to withstand any wind or snow loads without causing excess weight in the unit.
12. Screening is simply accomplished by circular framed screens of the required material which fit into the windband at top, or into airshaft of ventilator.
13. The Burt Free-Flow Gravity Ventilator can be converted into the Free Flow Fan Ventilator by the addition of fan barrel section between head and base. (See Page 9).

Bases see page 6. Dampers see page 7.

FOR MORE COMPLETE DETAILS, WRITE FOR BULLETIN SPV-78



gravity ventilators

Design and Structural Features

Protected Free Outlet Area in excess of 150% of air shaft area insures unrestricted passage through head.

Burt Inverted Lower Louvre, an exclusive feature, directs upward flow through ventilator head, increasing siphonage action and preventing backdraft.

Generous Overhang of ventilator top renders unit stormproof.

Amplly Proportioned Windband assures large suction area and improved air moving capacities.

Strong Internal Bracing insures rigidity under all conditions.

Glass Top can be supplied in place of metal to provide daylight so that ventilator also acts as skylight.

Bases see page 6. Dampers see page 7.

FOR MORE COMPLETE DETAILS, WRITE FOR BULLETIN SPV-8A

performance and dimension data

Cap., C.F.M.*	100	207	323	465	625	821	1035	1260	1800	2760	3860	5125	6466	7831	9297	10880	12540	16390	20820
Vent Sizes, Ins.	6	8	10	12	14	16	18	20	24	30	36	42	48	54	60	66	72	84	96
Over-all Diam., Ins.	10 $\frac{1}{2}$	13 $\frac{3}{4}$	17 $\frac{1}{4}$	20 $\frac{1}{2}$	24 $\frac{1}{2}$	27 $\frac{3}{4}$	31	34 $\frac{1}{2}$	41 $\frac{1}{2}$	47	57	66 $\frac{1}{2}$	76	85	95	105	114	133	152
Over-all Ht., Ins.*	8 $\frac{1}{2}$	10 $\frac{1}{2}$	13 $\frac{3}{4}$	15 $\frac{3}{4}$	17	19 $\frac{1}{4}$	22 $\frac{1}{2}$	23 $\frac{1}{2}$	25 $\frac{1}{2}$	36 $\frac{1}{2}$	40	47	55	57 $\frac{1}{2}$	65	68 $\frac{1}{2}$	75	85	99
Galv., Ga.	24	24	24	24	24	24	22	22	22	20	20	20	20	20	18	18	18-16	18-16	18-16
Copper, Oz.	16	16	16	16	16	16	18	18	18	20	20	20	20	24	24	24	32-36	32-36	32-36
Alum., B & S Ga.	22	22	22	22	22	22	20	20	20	18	18	18	18	18	16	16	16-14	16-14	16-14
Net Wt., Lbs.	6	7	9	13	15	19	28	36	46	81	115	151	206	264	390	464	672	912	1162

*Exclusive of base. **Temperature difference 20°F., stack height, 40 ft., wind velocity 10 m.p.h.
Where two gauges are shown, heavier is for air shaft only.

1. Its finely balanced design eliminates friction.
2. Free turning is assured by two sets of bearings.
3. Large top overhang provides assurance against storms or driving gales. A strong support tube and braces are built to withstand strongest winds.

Bases see page 6. Dampers see page 7.

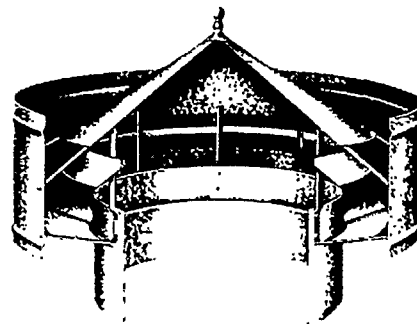
FOR MORE COMPLETE DETAILS, WRITE FOR BULLETIN SPV-9A

performance and dimensional data

Capacity cfm*	136	242	372	546	735	965	1200
Airshaft size	6	8	10	12	14	16	18
Galv. st. gauge	24	24	22-24	22-24	22-24	22-24	22-24
Overall height	13 $\frac{1}{2}$	16 $\frac{1}{2}$	19	22 $\frac{3}{4}$	25 $\frac{3}{4}$	28	30 $\frac{3}{4}$
Overall length	10 $\frac{1}{2}$	13 $\frac{3}{4}$	17 $\frac{1}{4}$	20 $\frac{3}{4}$	23 $\frac{3}{4}$	26 $\frac{1}{2}$	29 $\frac{1}{2}$
Outlet width	7 $\frac{1}{4}$	9 $\frac{1}{4}$	11 $\frac{1}{4}$	14 $\frac{1}{4}$	16 $\frac{1}{4}$	18 $\frac{1}{4}$	20 $\frac{1}{4}$
Net weight lbs.	6	9	12	17	22	27	34
Capacity cfm*	1465	2070	3110	4220	5290	6530	
Airshaft size	20	24	30	36	42	48	
Galv. st. gauge	20-22	20-22	18-20	18-20	18-20	18-20	
Overall height	32 $\frac{1}{2}$	38 $\frac{3}{4}$	44 $\frac{1}{4}$	53	62 $\frac{1}{2}$	70 $\frac{1}{4}$	
Overall length	32 $\frac{3}{4}$	38 $\frac{3}{4}$	50 $\frac{3}{4}$	55 $\frac{3}{4}$	69 $\frac{3}{4}$	81 $\frac{3}{4}$	
Outlet width	23	27	33 $\frac{1}{4}$	39 $\frac{1}{4}$	45 $\frac{1}{4}$	52 $\frac{1}{4}$	
Net weight lbs.	48	60	110	168	222	320	

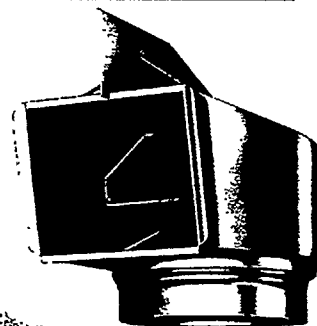
*Temp. diff. 20°F., Stack height 40 ft., wind velocity 10 m.p.h.
For more complete details, write for Bulletin SPV9A
Where two gauges are shown, heavier is for air shaft only.

"standard"



THE BURT STANDARD GRAVITY VENTILATOR is a highly efficient though moderately priced unit, built to Burt quality standards and with a capacity only slightly lower than that of the Burt "Free-Flow."

"revolving"



BALL BEARING REVOLVING VENTILATOR

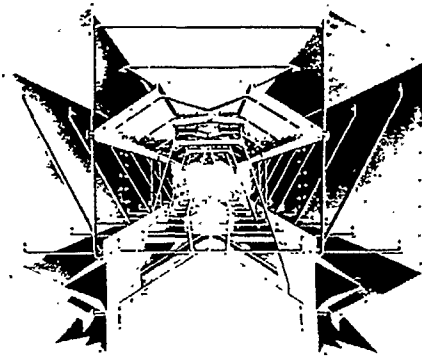
price of ball in which normal stack

price of ball in which normal stack

The Burt Manufacturing Company

— monovent continuous ridge ventilators —

small type



For uniform ventilation of large areas, and for the highest operating efficiency with due regard to architectural relationship.

Patented in U.S.A.

Design and Construction

Inconspicuous exterior makes it highly desirable on buildings where impairment of roof lines would be considered a detriment.

Ample damper and windband overhang together with continuous baffle design renders the unit absolutely stormproof and prevents any backdraft.

Continuous weep openings are sufficiently large to avoid clogging with leaves or cinders and are directly adjacent to the airshaft, below damper, where building heat aids in keeping snow or ice melted and opening clear.

Damper operating mechanism is located entirely below the damper, fully protected from the weather at all times.

Any size of Monovent can be furnished with either the hand controlled or motor operated dampers.

Motor operation consists of a reversible gear head motor with cable drum, limit switch and three position drum switch stops and starts operation in either direction.

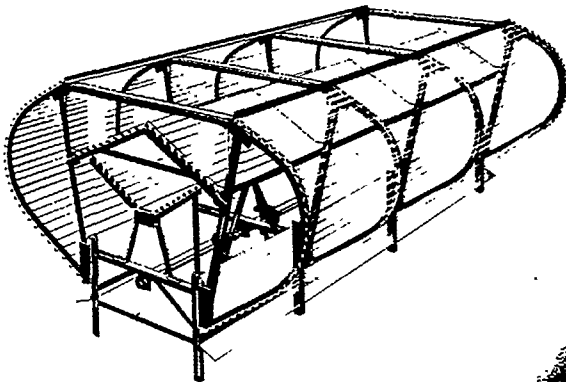
Construction is in standard 10-ft sections with special sections of shorter length to conform with building construction and capacity required. Sections are connected by butt joints in windband, airshaft and damper, tied together with splice plates.

Screens, when required, is provided in 5 or 10 ft. lengths, framed in metal and mounted at top outlet resting on top windband braces. It is readily removable for cleaning.

Mounting and Flashing Details

Methods of mounting and flashing Burt Monovent to roof are dependent upon (1) Size of Ventilator; (2) Roof Construction and Roofing Material.

large type



In industries where high heat or fume conditions demand removal of large volumes of air, the Burt large monovent is the most efficient and economical ventilator.

Design and Construction

Designed on broad, simple airflow lines, it is particularly well adapted for steel mills, foundries, forge shops, and other heavy industry. It has stability, ease of erection and high capacity.

The structural welded brace frames are evenly spaced at eight foot intervals in the length of the ventilator. Frames are designed for strength and easy erection. The airshaft, fixed top, windband and dampers are securely fastened to this structural framing. Continuous weep the full length prevents clogging by leaves or debris.

Dampers are center hinged type with rack and pinions controlled by sturdy worm gear drive and operating chain to floor level. They can be opened to a position suitable to any ventilating condition.

Sheet metal may be supplied in galvanized steel, asbestos protected metal, copper, aluminum, ceramic coated steel or other special metals.

Bracing members—painted steel, galvanized steel, brass, aluminum, acid resisting painted steel, and black steel with Neoprene or other special coatings.

Mounting and Flashing Details

The figures at right show the construction and mounting of these units for various types of roof with methods of flashing. Roof flashings are formed in the factory to fit the roof pitch. End plates are rigid and form a weatherproof seal at the ends of each run.

Erection instructions and detailed information on assembly of the various parts are supplied with each order.



gravity ventilators

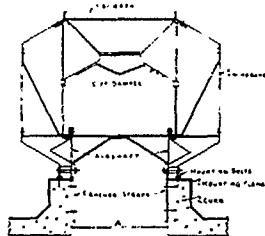
The figures below show the construction and typical mounting details for various types of roof openings and method of flashing.

Roof flashings are formed in the factory to fit curb or roof pitch. End plates are rigid and form a weatherproof seal at ends of each

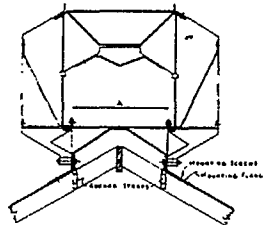
run.

In designing roofs care should be taken not to restrict the ventilation opening.

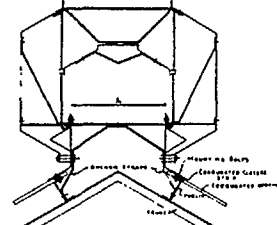
For 30" and larger size Monovent see lower half of this page.



MOUNTING DETAIL FOR CONCRETE CURB
Detail for Wood Curb is Similar



MOUNTING DETAIL FOR PITCHED ROOF
Detail for Flat Roof is Similar



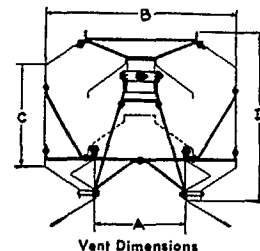
MOUNTING DETAIL FOR 4", 6", 9", & 12" SIZES
Flashing Shown for Corrugated Steel Roof

FOR MORE COMPLETE DETAILS WRITE FOR BULLETIN SPV-6A

performance and dimension data

Cap. C.F.M.	Vent. Size A	Vent. Dimensions—Ins.				Galv. or A.P.M. Ga.	Copper Oz.	Alum. B & S Ga.	Net Wt. per Ft.—Lbs.			
		B	C	D					Galv.	Copper	A.P.M.	Alum.
136	4	8 1/4	5 1/4	9 1/4	24	16	22	6.4	5.7	9.4	2.2	
203	6	13 1/4	7 1/4	12 1/4	24	16	22	9.2	8.2	13.3	3.1	
307	9	19 1/4	10	17 1/4	24	16	22	13.3	12.0	18.9	4.5	
410	12	25 1/4	12	21 1/4	22	18	20	19.4	17.3	26.2	6.5	
614	18	36 1/4	18 1/2	31 1/4	20	18	18	34.4	26.4	44.7	11.5	
820	24	46	23 1/4	37 1/4	18	20	16	51.9	34.9	65.7	17.3	

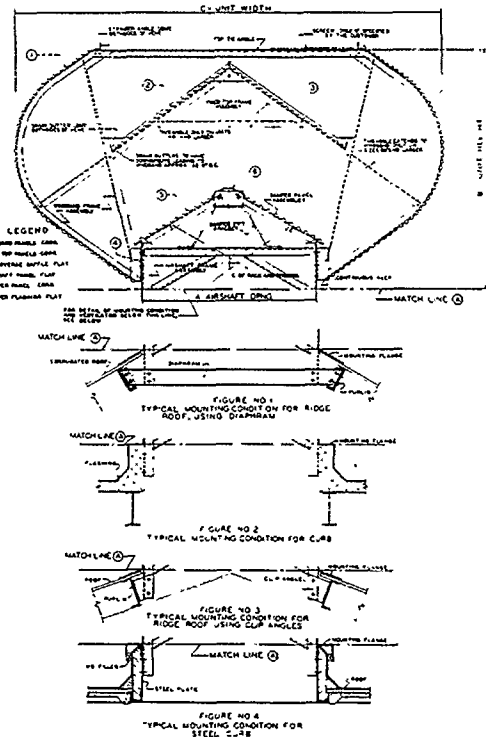
*Per foot of length. Temp. diff. 20°F; stack height 40 ft.



performance and dimensional data

capacity c.f.m. per foot	dimensions - inches				sheet metal gauges					
	ventilator size	A	B	C	galv. steel - a.p.m. ceramic coated st'l.			aluminum		
					Corr.	Flat	W/B - Gutters Flat F/T - Flash-Air-Dpr. ingas Shft.	Corr.	Flat	W/B - Gutters Flat F/T - Flash-Air-Dpr. ingas Shft.
820	24	24	34 1/2	61 1/4	22	22	20	.032	.032	.040
1025	30	30	41 1/4	74 1/2	22	22	20	.032	.032	.040
1230	36	36	48 3/4	87 1/4	22	22	20	.032	.032	.040
1435	42	42	56 3/4	101 3/4	22	22	20	.032	.032	.040
1640	48	48	62 3/4	114 1/4	22	22	20	.032	.032	.040
1845	54	54	69 3/4	129	22	22	18	.032	.032	.050
2050	60	60	77 3/4	143	22	22	18	.032	.032	.050
2460	72	72	92 1/2	168	22	22	18	.032	.032	.050
2870	84	84	106 3/4	197 1/2	22	20	18	.032	.040	.050
3280	96	96	120	225 3/4	22	20	18	.032	.040	.050
4100	120	120	154 1/2	285 1/2	22	20	18	.032	.040	.050

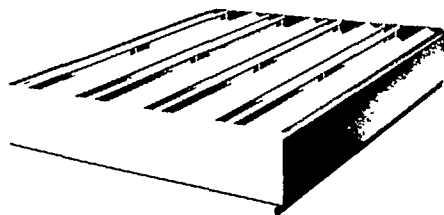
Notes —
* per foot of length — Temperature difference 20°F; stack height 40 ft.
ventilator frames on 8" centers of min. 3/16" thick angle.
sheet metal panels span one frame spacing.
ventilators designed to withstand wind load of 30 pounds per square foot.
Ventilator can be supplied with or without damper.
For more complete details write for Bulletin SPV-6B-61.



The Burt Manufacturing Company

USHO 003428

thermavent



Design and Construction

The Burt Thermavent is a gravity roof ventilator designed to have the smallest possible height commensurate with efficiency of operation. The units are designed to fit upon a curb and have a total height of 20½" above the curb. Designed to a standard size of 9'6" wide x 7'6" long, they consist of three ventilating cells, each of which has an airshaft opening of 12" x 14" or 9½ square feet, so that a standard 9'6" three cell unit will have 28½ square feet of outlet opening.

Special two cell units can be supplied 9'6" wide x 5'0" long, 5'0" wide x 7'6" long or 5'0" wide x 5'0" long with two airshaft openings. These units supplied only on special order.

Each cell has a damper and all dampers are operated in unison either by hand chain, worm gear operators, or by motor operation and may be opened to any required degree. As much outlet area as may be necessary for any size building may be obtained by using as many standard units as are required, either as single units placed in strategic positions over the roof; or joined together in one or more continuous runs down the length of the roof.

The units are weatherproof and have ample drainage with the water flowing to the sides of the unit and escaping to the roof through continuous weep spaces and out over the curbs.

The units are designed to take bird screens which are supplied as an extra when desired.

Materials

Standard construction is of Galvanized steel with 16 gauge curb, 18 gauge support members, dampers 20 gauge and 22 gauge sheets for the balance of the unit. Other materials can be used, however, such as aluminum, asbestos protected metals, copper or stainless steel.

Unit Arrangement and Installation

Because the Burt Thermavent is light in weight, it is specially adapted to use on modern roof construction where long span joists are used.

For use on large roof areas this unit has wide adaptability to new or existing roofs.

Where used on top of an existing Monitor, louvers or window sash must be permanently closed to prevent short circuiting of the vent stream so that supply air has to be drawn from the main floor area.

Curb construction is simple in arrangement and can be adapted to various types of building construction.

Damper Construction

As in all Burt ventilator construction, the damper operating mechanism is of good sturdy construction, designed and built for the life of the unit and with practically no maintenance.

All dampers are connected together and a run of five standard units may be operated either manually or by electric motor.

Stage Ventilation

For stage ventilation and other installations where fire hazard is of importance, these units may be fitted with fusible links and counter-weighted dampers so that in case of fire, all dampers automatically open to the fullest extent for the quick passage of smoke and flame to meet underwriter's requirements. In these units, the fusible link is placed in the direct air stream.

Monitor Type



Monitor Type

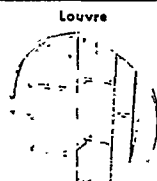
A large ventilator designed for exhausting air from Glass Plants, Forge Shops, Steel Mills, Aluminum Plants and other industries where extreme heat conditions require large volumes of air to be exhausted from the building.

This unit has very high efficiency and is weatherproof with ample drainage facility to roof. Dampers are continuous down one side of the vent and operated by grease filled worm gears and hand chain or may be motor operated when desired.

A large expanse of windband takes full advantage of wind velocity to obtain large capacities and suction effect in addition to the temperature difference and stack height.

Burt engineers will be glad to cooperate with prospective customers to obtain the best solution of your air moving problem to obtain the maximum amount of exhaust at least cost.

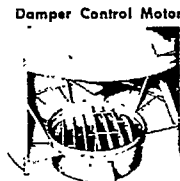
dampers and controls



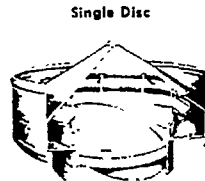
Louvre



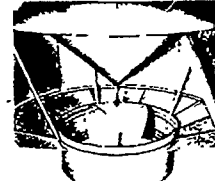
Sliding Cone



Damper Control Motor



Single Disc



Butterfly

There are five general types of dampers which in several instances are interchangeable. All types shown are efficient in operation and require a minimum of attention. The correct type will be provided according to conditions or preferably upon the recommendations

of Burt Engineers. Damper control motors are enclosed in ventilated but weathertight housing outside ventilator airshaft. When used with fan ventilators, control can be for selective operation or interconnected with fan motor.

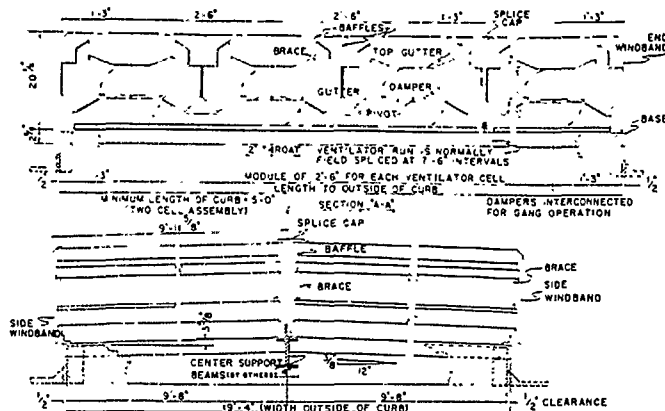
FOR MORE COMPLETE DETAILS WRITE FOR BULLETIN SPV-14A

USHO 003429

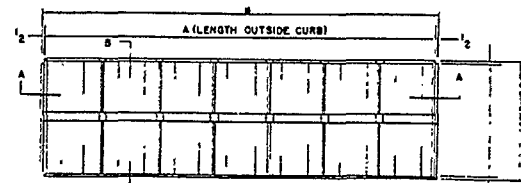


gravity ventilators

Unit Arrangement and Installation

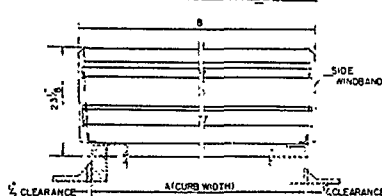


MATERIAL GAUGES				
ITEM	GALV	ALUM.	COPPER	A.P.M.
BASE	16	14	48 OZ	18
DIAPHRAGM BRACES	18	16	32 OZ	18
DAMPERS	20	18	24 OZ	22
WINDBAND	22	18	24 OZ	22
GUTTERS, BAFFLES, ETC.	22	20	24 OZ	22



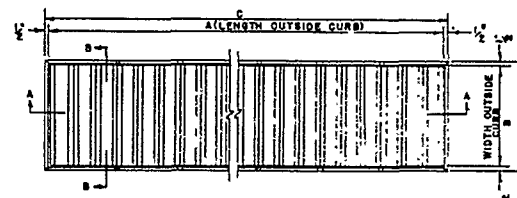
PLAN OF BURT DOUBLE RUN THERMAVENT

SECTIONS THRU DOUBLE RUN THERMAVENT

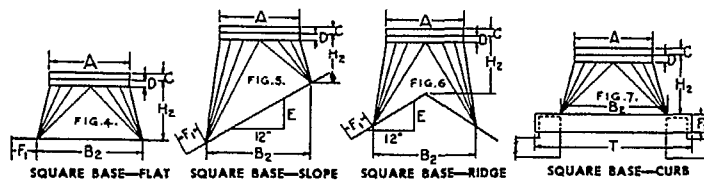


A	B
4'-6"	5'-0"
5'-0"	7'-6"
5'-6"	10'-0"

SECTIONS THRU SINGLE RUN THERMAVENT



PLAN OF BURT SINGLE RUN THERMAVENT



bases

All Burt Bases are tailor made to fit the shape of the roof and are constructed to withstand severe wind and snow loads together with the weight of the ventilator.

They have a wide flashing for rigid mounting and in the larger sizes are provided with Angle rings and stiffener angles. Dimensions as given are Burt standard but bases for special conditions can be furnished to customers dimensions. In ordering customer should supply dimensions "B-2," "T" and "E" (Roof slope inches per foot) which ever applies and order by Figure number. Condensation gutters are optional at extra cost.

FOR MORE COMPLETE DETAILS, WRITE FOR BULLETIN SPV-15B

DIMENSIONS IN INCHES										METAL GAUGES		NET WEIGHTS					SHIPPING WEIGHTS					
A	Round Base	B-1 Diam.	B-2	C	D	F-1	F-2	H-1	H-2	Ga.	Galv.	Co. Copr.	Ga.	Co. A.P.M.	Round Bases		Square Bases		Round Bases		Square Bases	
	Galv.														Copr.	Galv.	Copr.	A.P.M.	Galv.	Copr.	Galv.	Copr.	A.P.M.
6	6	10x10	1	0	4	3	6	5	22	16	24	4	3	7	5	8	15	14	16	14	12	
8	8	12x12	1	0	4	3	6	6	22	16	24	5	4	8	6	9	17	16	18	16	15	
10	10	14x14	1	0	4	3	6	7	22	16	24	6	4	10	7	12	19	17	20	18	20	
12	12	16x16	1	0	4	3	6	8	22	16	24	7	5	12	9	14	21	19	23	20	25	
14	14	18x18	1	0	4	3	7 1/2	9	22	16	24	9	7	15	11	17	25	22	26	22	28	
16	16	20x20	1	0	4	3	7 1/2	10	22	16	24	11	8	17	13	19	26	24	29	25	31	
18	18	22x22	1	0	4	3	7 1/2	10 1/2	20	18	22	14	10	23	16	26	30	26	35	28	31	
20	20	26x26	1	0	5	3	7 1/2	11	20	18	22	17	12	30	21	34	35	31	43	37	42	
24	24	30x30	1	0	5	3	7 1/2	11 1/2	20	20	22	21	16	37	28	42	40	35	50	42	55	
30	30	36x36	1 1/2	3 1/2	5	4	10 1/2	15 1/2	18	24	20	39	27	62	43	62	59	41	73	37	71	
36	36	42x42	1 1/2	3 1/2	6	4	10	16	18	24	20	52	36	81	56	81	65	59	95	74	93	
42	42	48x48	1 1/2	3 1/2	6	4	10	16 1/2	18	24	18	63	44	98	68	116	90	74	117	92	131	
48	48	54x54	1 1/2	3 1/2	6	4	13	17 1/2	18	28	18	80	65	117	94	139	144	127	157	132	171	
54	54	60x60	2	3	6	4	12 1/2	18	18	32	18	95	88	152	141	195	160	149	202	192	245	
60	60	66x66	2	3	5	4	12 1/2	19	16	32	17	135	103	214	162	226	220	190	303	260	311	
66	66	72x72	2	3	6	4	12 1/2	20	16	32	17	155	117	249	193	271	233	205	341	294	366	
72	72	78x78	2	3	6	4	15 1/2	21	16	36	17	264	233	350	310	414	371	347	472	447	533	
84	84	90x90	2	3	9	4	15 1/2	22	16	36	17	341	300	463	407	504	462	433	687	641	721	
96	96	102x102	2 1/2	2 1/2	9	4	15 1/2	23	16	36	17	430	380	583	516	620	541	508	823	755	866	

The Burt Manufacturing Company 7

USHO 003430

fans

"airfoil fan"



Burt Axial Flow Airfoil Fan

In sizes 30" to 84" the new Burt Axial Flow Airfoil Fan is used. This fan, designed to deliver maximum air movement per horsepower, is the result of modern aerodynamic design coupled with laboratory development work carried on by experienced engineers. Fan wheel is made of Silicon Aluminum Alloy Castings with high tensile alloy steel fasteners.

The blades are of airfoil section, designed specially for fan duty and the contours are such—that true axial flow is obtained, utilizing the entire blade area and producing a uniform velocity throughout the area traveled by the blades.

These fans are correctly proportioned to minimize tip and hub losses and the hub is designed to obtain high efficiency with exceptional strength.

The complete fan is truly balanced and then tested upon the motor in the fan section before leaving our plant.

Because of its advanced design, with frictional and recirculation losses at a minimum, more air per horsepower is delivered.

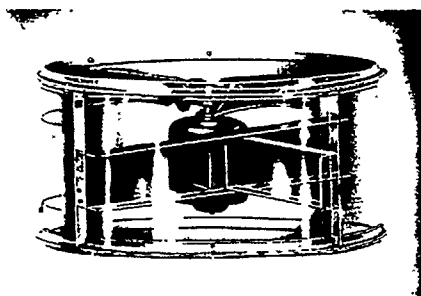
For the industrial plant where large volumes of air are to be removed they are extremely efficient and will handle air at wide differences of temperature, pressure and volume.

Airfoil fans can be supplied for static pressure conditions.

Fans For Burt Ventilators

Burt Fan Wheels are made in two types. For ventilator sizes 12" to 24", steel wheels are supplied with steel hubs, spider of pressed steel and blades of sheet steel. The blades are laminated and riveted to withstand heavy continuous duty.

fan motor units

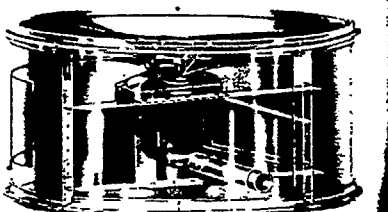


Regular Motor Mounting

For ordinary ventilating problems where no adverse conditions exist and the primary requisite is a high movement of air, the Regular Motor Mounting with motor direct connected to fan wheel is normally used. Motors with standard insulation will operate satisfactory in temperatures up to 105° F. Motors provided with Class B insulation (heat resisting) can be used in temperatures up to 140° F. The fan section consists of an airshaft of sufficient height to house the motor mounting, motor and fan wheel.

Platform for mounting motors in the smaller sizes, is of heavy formed steel construction with the addition of back support in the medium sizes. In the larger units, where motors become heavy, motor platforms are of structural steel properly designed for the load and speed conditions.

For sizes 30" and larger, angle rings are provided at top and bottom of the section for reinforcement and connection to head and base. To transmit load directly to the roof structure and to further reinforce the fan barrel, vertical stiffener angles are welded between the rings at four points and riveted to the airshaft.

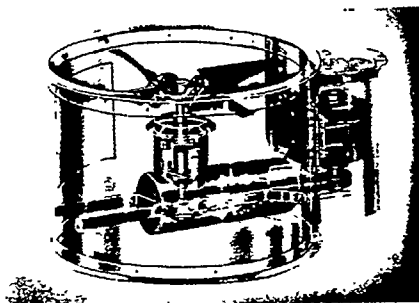


Heat Resisting Mounting

Where the temperature of the air exceeds 105° F., but is intermittent and does not exceed 150° F. Heat Resisting mounting provides protection for the motor. If temperatures are constant and are slightly higher, Class B. insulation motor windings should be used for added protection. In ordering, give temperature of the air to be moved.

The motor is rigidly fastened in a sheet steel shell properly proportioned to allow an annular air passage between motor and shell. A circular air intake of heavy gauge steel extends through and is fastened to the airshaft, as illustrated in the cut. The action of the ventilator fan draws outside air through the air intake upward between motor and shell, discharging it into the main air stream at the top of the motor. By using these air intakes, a supply of outside air is obtained, independent of the main exhaust stream which allows the ventilator to be used in temperatures much higher than would otherwise be possible.

Electrical and greasing connections are easily accessible from the inspection door.



V Belt Drive Motor Mounting

For severely corrosive or high temperatures or where, for any reason, it is desirable to keep the motor outside of the air flow duct, the V Belt Drive Motor Mounting is recommended.

The fan wheel is mounted upon a central shaft running in ball bearings which are in turn mounted in heavy steel plate tube reinforced by a plate.

The fan drive consists of V Belts connected by V-Belt drive pulleys to the motor.

The entire drive is enclosed in a circular steel casing with removable cover at end for protection against any destructive effects of the discharged air. The enclosure acts as a fresh air duct with outside air being drawn in over the pulleys and belt by the action of the fan and discharging into the main airstream.

The drive motor, mounted on the outside of the fan section in a sheet metal housing is entirely removed from any heat or corrosive condition.

The motor mounting of structural steel supports and steel base is designed for adjustment of belt tension when required.



fan ventilators

"free flow" fan

Is a motor powered companion unit to the Free Flow Gravity, the advantages of which are even more marked in high velocity fan work when accelerated ventilation is desired to exhaust unfavorable atmospheric conditions such as smoke, dust, fumes, excessive heat, steam, etc.

exhaust capacities Burt free flow fan ventilators

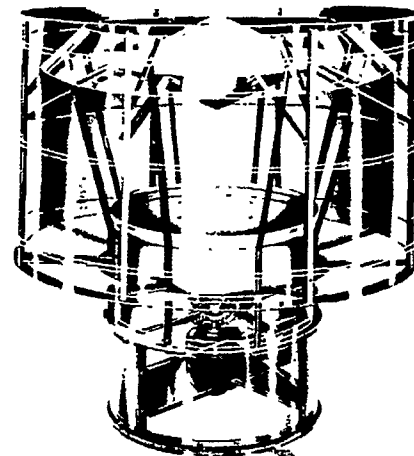
Capacity C.F.M.	Vent. Size Inches	Fan Diam. Inches	Motor		Fan Section Ht. Inches	Over-all Height Inches	Net Weight Lbs.
			H.P.	R.P.M.			
1040	12	10 1/2	1/10	1725	12	40 1/4	60
1550	14	12 1/2	1/10	1725	12	43 1/4	73
2150	16	14 1/2	1/8	1140	15	52 1/4	93
2620	18	16 1/2	1/8	1140	15	55 1/4	105
3340	20	18 1/2	1/8	1140	15	57 1/2	156
4500	24	22 1/2	1/8	1140	15	65 1/4	201
5400	30	28	1/4	1140	18 1/4	81 1/4	385
6460	30	28	1/4	1140	18 1/4	81 1/4	385
8280	30	28	1/4	1750	18 1/4	81 1/4	370
10380	36	34	1/2	1140	18 1/4	87 1/4	543
11625	36	34	1/2	1140	18 1/4	87 1/4	556
13020	36	34	1	1750	18 1/4	87 1/4	554
14230	42	40	1	860	20 1/4	96 1/4	736
16045	42	40	1	1140	18 1/4	94 1/4	714
18125	42	40	1 1/2	1140	20 1/4	96 1/4	741
19530	42	40	2	1140	20 1/4	96 1/4	765
18835	48	46	1	860	20 1/4	103 1/4	905
23900	48	46	2	1140	20 1/4	103 1/4	917
27715	48	46	3	860	26 1/4	109 1/4	1038
31800	48	46	5	1140	26 1/4	109 1/4	1038
29760	54	52	2	860	24 1/4	116 1/4	1247
32550	54	52	3	860	26 1/4	118 1/4	1290
38130	54	52	5	1140	26 1/4	118 1/4	1290
32364	60	58	2	860	24 1/4	126 1/4	1747
36820	60	58	3	860	26 1/4	128 1/4	1792
43710	60	58	5	860	30 1/4	132 1/4	1919
51150	60	58	7 1/2	1140	30 1/4	132 1/4	1919
41850	66	64	3	860	26 1/4	135 1/4	2183
53940	66	64	5	860	30 1/4	139 1/4	2325
59520	66	64	7 1/2	860	32 1/4	141 1/4	2402
64170	72	70	7 1/2	860	32 1/4	154 1/4	3015
69900	72	70	10	860	32 1/4	154 1/4	3037
81000	72	70	15	860	36 1/4	158 1/4	3127
85000	84	82	10	720	36 1/4	162 1/4	3864
99050	84	82	15	720	36 1/4	171 1/4	3929

Capacities shown are with the Free Flow head in place on the fan barrel and have been corrected to standard atmospheric conditions. The "free delivery" capacities are to be used when the ventilator is exhausting directly from open building spaces. Where the fan ventilator is to operate under static pressure conditions consult the Burt Engineering Department.

FOR MORE COMPLETE DETAILS, WRITE FOR BULLETIN SPV-10A

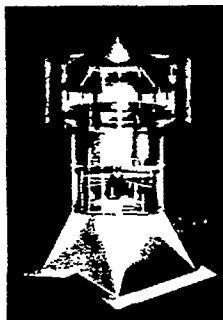
The "Free Flow" head is the same as described on page 2 and the fan and motor units are described on page 8. Good gravity ventilation is provided when the fan is not operating.

"free flow fan"



Phantom view showing compact installation of motor fan unit in Regular Type with Free Flow Head, K-Frame connection, angle ring connections and base.

standard fan



The Burt "Standard" Fan Ventilator is a moderately priced unit which is an adaptation of the Standard Gravity type (page 3) with discharge velocities greatly increased by the fan unit.

Fan Sections, see page 8.

Air Moving Capacities Excellent for ordinary ventilating problems though deliveries lower than Free-Flow type.

Lower In Over-all Height than Free-Flow type.

Greatly Increased Air Movement over gravity types.

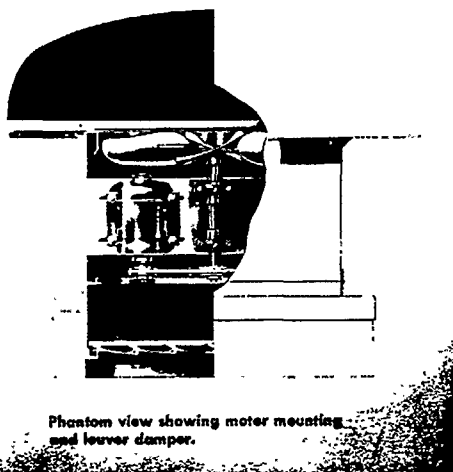
Capacity C.F.M.	Vent. Size Inches	Fan Diam. Inches	Motor		Over-all Diam., Ins.	Over-all Height Inches	Net Weight Lbs.
			H.P.	R.P.M.			
685	12	10 1/2	1/10	1725	20 1/4	36	58
1070	14	12 1/2	1/10	1725	24 1/4	39	65
1340	16	14 1/2	1/8	1140	27 1/4	44	76
1900	18	16 1/2	1/8	1140	31	51	100
2650	20	18 1/2	1/8	1140	34 1/4	52	120
3500	24	22 1/2	1/8	1140	41 1/4	57	141
5550	30	28	1/4	1140	47 1/4	70	257
7500	36	34	1/2	1140	56 1/4	74	343
10000	42	40	3/4	860	66 1/4	83	415
15000	48	46	1	860	75 1/4	91	609

The Burt Manufacturing Company 9

USHO 003432

low type fan ventilators

"low type"



Burt Low Type Fan Ventilator is a highly efficient power driven fan ventilating unit, which is low in height, pleasing in general design and meets the architectural requirements for an inconspicuous roof ventilator.

Modern engineering has combined in this unit high capacity, positive weather-proofness, and simplicity of installation. It may be used either as an exhaust fan ventilator or as a fresh air supply unit with high efficiency.

The base of the unit fits over a standard square curb with ample flashing.

The power drive may be either direct motor drive or driven by means of V belt and pulleys. The latter allows for low speed fans and motor of higher speed with its attendant lower cost. Adjustable drive pulleys may be supplied at a slight additional cost.

For the handling of corrosive fumes or excessive heat the unit can be engineered to meet such applications.

For easy access to the power unit and drive assembly sizes up to 30" are hinged at the base enabling the upper part of the unit to be lifted, thus exposing the power unit for ease of maintenance and belt adjustment. In the larger sizes a removable panel in one side of the unit is provided for the same purpose. Outlet hood on all sizes is also hinged for access to the fan.

The Fan Wheels are low noise level and aerodynamically designed for the varying capacities and static pressures involved.

Electric Motors are totally enclosed ball bearing 55° C. temp. rise of sufficient power for the duty involved. They can be supplied for any current characteristic, also in explosion proof frames when required.

Automatic Louver Type Dampers as shown may be supplied or they can be motor operated when required.

Standard Materials are prime galvanized steel sheets with framing of structural steel. However, other material can be supplied, such as aluminum, stainless steel or other materials which may be adapted to this type of construction.

exhaust capacities Burt low type fan ventilators

Fan dia	Motor		Fan r.p.m.	cfm at varying static pressure				
	h.p.	r.p.m.		0"	1/4"	3/4"	1 1/2"	2"
12T1	1/4	850	D	700	337			
12T2	1/4	1140	D	975	800			
12T3	1/4	1725	D	1470	1375			
12T4	1/4	1725	D	1470	1375	1250		
14T1	1/4	850	D	800	660			
14T2	1/4	1140	D	1445	1275			
14T3	1/4	1725	D	2180	2090	1975	1800	
16T1	1/4	850	D	1650	1360			
16T2	1/4	1140	D	2220	2025			
16T3	1/4	1725	D	2980	2815	2680	2500	
18T1	1/4	850	D	2260	2035			
18T2	1/4	1140	D	3040	2870	2680		
18T3	1/4	1725	D	3460	3360			
20T1	1/4	1725	580	2220	1400			
20T2	1/4	1725	720	2750	2220			
20T3	1/4	850	D	3240	2900			
20T4	1/4	1140	D	4350	4130	3800	3325	
22T1	1/4	1725	600	3450	2400			
22T2	1/4	1725	720	4120	3500			
22T3	1/4	850	D	4300	3900			
22T4	1/4	850	D	3920	3500	2880		
22T5	1/4	1140	D	5250	4950	4610		
22T6	1/4	1140	D	4290	4010	3680	3100	
24T1	1/4	1725	530	4160	2700			
24T2	1/4	1725	600	4710	3690			
24T3	1/4	1725	720	5650	4960			
24T4	1/4	850	D	5650	5270	4440		
24T5	3/4	1140	D	6750	6220	5620	4890	
28T1	1/4	1725	600	6450	5650			
28T2	1/4	1725	600	5400	4310	3210		
28T3	1/4	1725	600	7370	6375			
28T4	1/4	1725	720	6480	5680	4430		
28T5	3/4	850	D	7650	7020	6130		
28T6	3/4	850	D	6190	5590	4800	3900	
28T7	1 1/4	1140	D	10280	9860	9310		
28T8	1 1/4	1140	D	8300	7900	7400	6800	
30T1	1/4	1725	600	5270	4200			
30T2	1/4	1725	720	6320	5580	4080		
30T3	1/4	850	D	7480	6710	5910		
30T4	1	850	D	9100	8450	7500	6400	
36A1	1/4	1140	425	9000	7700	4000		
36A2	3/4	1140	425	10200	8400	6400		
36A3	1	1725	570	12000	9800	7700	5600	
36A4	1 1/4	1725	690	13200	11500	9500	7500	
36A5	2	850	D	15000	13500	11000	9000	7200
42A1	3/4	1140	450	12100	9800	7000		
42A2	1	1140	570	15200	11650	8600	6520	
42A3	1 1/4	1750	690	17200	14000	10970	8200	
42A4	2	850	D	18900	16200	12800	10080	7700
48A1	1	1140	450	17800	12750	8940		
48A2	2	1750	570	21500	18000	14000	10650	
48A3	3	850	D	24500	22200	18350	15000	11900
48A4	5	1140	D	30400	26600	22500	18800	15800
54A1	2	1140	450	23000	20000	15850	12500	8620
54A2	3	1140	570	30400	26600	20050	16200	12250
54A3	5	850	D	36900	30600	26000	21600	17850
60A1	2	1140	450	30600	22320	17150	12300	
60A2	3	1140	570	34100	28300	22300	17900	13000
60A3	5	850	D	41400	34800	29400	24000	19000
60A4	7 1/2	850	D	47400	42400	36500	30000	24500

D indicates Direct Drive. Other speeds and H.P. can be supplied.

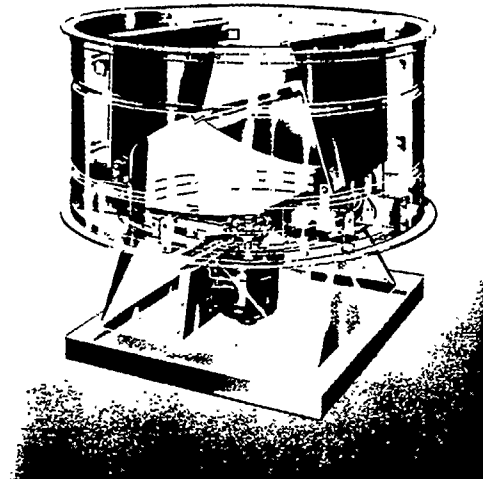
FOR MORE COMPLETE DETAILS, WRITE FOR BULLETIN SPV-16

free exhaust fan



fan ventilators

"F. E. F."



The Burt Free Exhaust Fan Ventilator has been designed for highly efficient service in the rapid removal of air contaminated with smoke, dust and heat.

This ventilator is equipped with the Burt Axial Flow Fan direct connected to an electric motor which is mounted on a rigidly constructed platform in the base of the unit. The base is equipped with an access door for convenience in erection and servicing.

The Airshaft extends above the fan and terminates in a pair of dampers which open automatically when the motor is started. When the dampers are open an unrestricted column of air is drawn upward by the axial flow fan exhausting a very high volume of air through the unit.

When the motor is shut down, the dampers automatically close and are designed to make a thoroughly weatherproof structure. A rigidly constructed windband surrounds and protects the dampers, but the unit does not function as a gravity exhaust unit.

Standard construction is of galvanized steel sheets and heavy steel structural members but can be supplied in aluminum, protected metal, etc.

Motors are totally enclosed ball bearing type and can be supplied for any Standard characteristic also in explosion proof frames when specified.

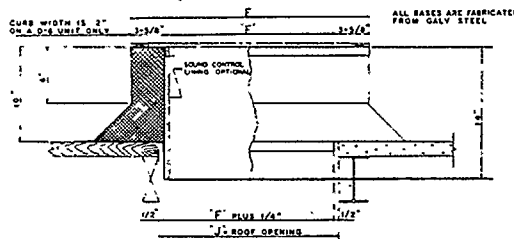
Where corrosive fumes or excessive heat conditions prevail the unit can be furnished with motor shroud and ventilating duct.

exhaust capacities Burt F.E.F. ventilators

Vent size inches	Capacity cfm	H.P.	Motor R.P.M.	Overall height inches	Curb dim inches	Weight lbs.
24	5000	1/2	1140	36 1/2	39x39	259
	6800	1 1/2	1750			257
30	10000	3/4	1750	44 1/2	45x45	397
	11800	1	1750			400
36	14200	1	1750	49	51x51	476
	16000	1 1/2	1750			484
42	18500	2	1750	53 1/2	57x57	497
	24000	2	1140			617
48	27000	3	1140	58 1/2	63x63	674
	31000	5	1750			662
54	31460	3	1140	66 3/4	69x69	818
	37300	5	1750			806
60	42700	7 1/2	1750	72 1/2	75x75	871
	47600	7 1/2	1140			1213
60	52460	10	1140	72 1/2	75x75	1297
	66000	10	1140			1460
60	75550	15	1140	72 1/2	75x75	1495

FOR MORE COMPLETE DETAILS, WRITE FOR BULLETIN SPV-18

burt prefabricated curbs

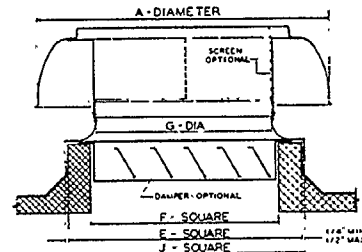


Type of Ventilator

Centriflow Model 'D'	Centriflow Model 'B'	E	F	J
D-6		13	9	10 1/4
D-7 D-8		17	9 3/4	11
D-9 D-10 D-11		20	12 1/4	14
D-12 D-14		24	16 1/4	18
	B-16 B-18	27	19 3/4	21
	B-22 B-24	33	25 3/4	27
	B-33 B-36	45	37 3/4	39
	B-42 B-48	57	49 3/4	51

burt spun aluminum gravity relief ventilator-model 'gr'

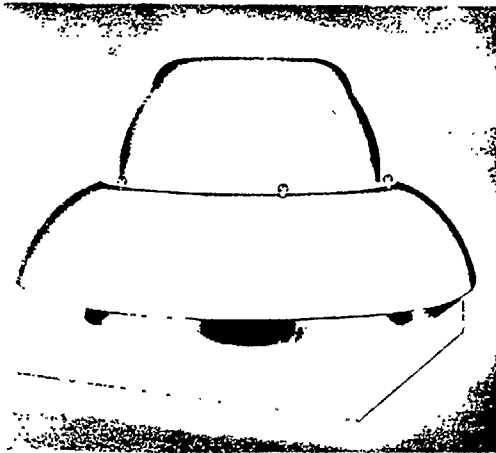
dimensional data



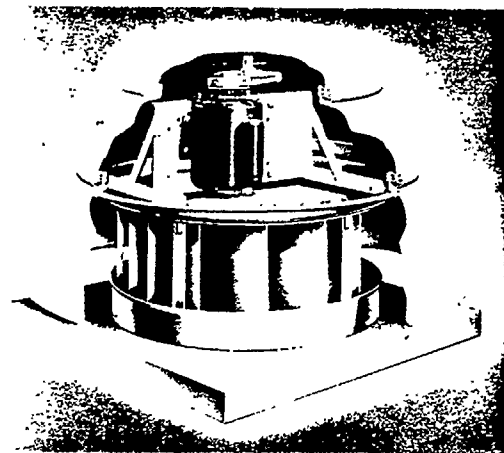
dim.	gr-12	gr-16	gr-18	gr-20	gr-24	gr-27	gr-32	gr-36	gr-42	gr-48
G	12	16 1/2	18 1/4	20 3/8	24 3/16	27 1/8	31 1/2	36	42 3/16	48 3/8
A	26 1/2	26 1/2	34	34	44	44	55 1/2	55 1/2	62	76
F	12	16	18	20	28	31	34	40 1/2	45	48
E	20	24	26	28	36	39	42	48 1/2	53	56
J	20 1/2	25	27	28 1/2	37	40	43	49 1/2	54	57



All New - Spun Aluminum direct & v-belt drive centriflow fans



direct drive spun units



V-belt drive spun units

design

- rugged dependable Burt design and manufacture thru-out
- low pleasing appearance
- non-overloading backward curved centrifugal fan wheel
- motors and drives on oversized resilient mountings
- motors mounted in separate compartment out of air stream
- easy access for installation and inspection
- wide selection of sizes, capacities, speeds and static pressures
- curb sizes designed for minimum noise levels

construction

- heavy gauge spun aluminum housings
- oversize supports
- all aluminum non-sparking fan wheels
- v-belt drive units have adjustable sheaves

dampers

- drop-in-sleeve type
- automatic back-draft
- motor operated (2 position and modulating)

motors

- heavy duty, open frame, ball bearing for fractional and integral ratings in ventilated housings
- shaded pole ratings open frame ball and sleeve bearings

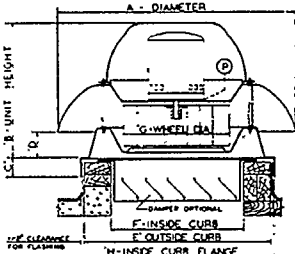
modifications

- disconnect switches
- screens
- special protective coatings
- sub-bases
- pre-fabricated insulated curbs
- curb gaskets
- unit hinges
- various motor power characteristics and frame enclosures and multi-speeds
- factory wiring

ratings

- units of 16" wheel diameter and larger carry AMCA certified capacity ratings
- smaller sizes certified and guaranteed by Burt in accordance with applicable code
- units sizes from 6" wheel diameter thru 48" wheel diameter
- static pressure range 0" thru 1" w.g. (higher static pressures on application)
- horse-power ratings from 1/20 thru 7-1/2

dimensional data—direct drive units

	unit size	a	b	d	e	f	g	c	h
D-6	16	10 $\frac{7}{8}$	2 $\frac{3}{4}$	13	9	unit	2	14	
D-7 & D-8	22 $\frac{1}{2}$	14 $\frac{1}{8}$	2 $\frac{3}{4}$	17	9 $\frac{1}{2}$	size	2 $\frac{1}{2}$	18	
D-9, D-10 & D-11	27	16 $\frac{1}{2}$	3	20	12	plus	2 $\frac{1}{2}$	21	
D-12 & D-14	32	18 $\frac{3}{8}$	3 $\frac{1}{2}$	24	16	$\frac{1}{4}$	2 $\frac{1}{2}$	25	

Certified Capacity Ratings

v-belt drive units

Unit No. and Wheel Dia.		H. P.	Fan R.P.M.	Fan Inlet Area Sq./Ft.	C. F. M. AT STATIC PRESSURE									
			TIP Speed Ft./Min.		0	1/4	1/2	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/4
B-16	A	1/4	752	3150	1683	1410	1140	800						
	B	1/4	827	3460	1851	1600	1350	1080						
	C	1/4	948	3980	2121	1900	1680	1465	1215	900				
	D	1/4	1044	4360	2336	2140	1940	1740	1540	1310				
	E	1/4	1193	5010	2670	2500	2330	2150	1980	1810	1620			
B-18	A	1/4	618	2920	1969	1600	1210	500						
	B	1/4	680	3210	2167	1830	1480	1070						
	C	1/4	778	3670	2480	2190	1890	1580	1180					
	D	1/4	857	4140	2730	2460	2200	1920	1630	1260	300			
	E	1/4	980	4620	3123	2900	2660	2420	2180	1925	1630	1230		
B-22	A	1/4	442	2540	2571	1930	1160							
	B	1/4	487	2810	2833	2250	1650							
	C	1/4	550	3170	3200	2690	2170	1550						
	D	1/4	660	3800	3650	3200	2750	2250	1675	500				
	E	1/4	755	4360	4170	3750	3350	2940	2525	2075	1300			
B-24	A	1/4	455	2860	3265	2525	1750							
	B	1/4	520	3260	3730	3080	2450	1700						
	C	1/4	570	3580	4090	3500	2900	2325	1350					
	D	1/4	655	4110	4700	4280	3680	3175	2675	1825				
	E	1/4	750	4710	5382	4940	4500	4050	3600	3150	2590	1700		
B-27	A	1/4	372	2630	3801	2780	1600							
	B	1/4	426	3011	4353	3480	2600	950						
	C	1/4	469	3315	4792	4000	3170	2250						
	D	1/4	537	3796	5487	4780	4100	3400	2525					
	E	1/4	613	4333	6264	5650	5050	4420	3800	3100	1600			
B-30	A	1/4	358	2812	5017	3870	2640							
	B	1/4	394	3100	5522	4475	3410	1900						
	C	1/4	451	3530	6321	5400	4500	3500	2000					
	D	1/4	516	4040	7232	6430	5650	4850	3920	2700				
	E	1/4	568	4460	7960	7240	6500	5800	5050	4200	3050			
B-33	A	1/4	336	2890	6268	4900	3500							
	B	1/4	384	3320	7163	6000	4800	3375						
	C	1/4	440	3800	8208	7200	6150	5100	3800					
	D	1/4	470	4060	8582	7850	7100	6250	5200	3500				
	E	1/4	538	4648	9824	9150	8500	7800	7100	6100	4950	3100		
B-36	A	1/4	281	2648	6661	5280	3150							
	B	1/4	321	3025	7609	6420	5050	1800						
	C	1/4	369	3478	8747	7700	6600	5150	1800					
	D	1/4	407	3836	9649	8700	7750	6620	5100	1250				
	E	1/4	465	4383	11022	10220	9350	8500	7450	6200	3800			
B-42	A	1/4	250	2748	9410	7600	5200							
	B	1/4	286	3143	10765	9200	7450	4500						
	C	1/4	315	3462	11857	10430	8950	6980	2800					
	D	1/4	360	3956	13551	12300	11050	9700	7760	4400				
	E	1/4	396	4352	14906	13800	12650	11500	10100	8200	4900			
B-48	A	1/4	229	2879	12867	10600	7900							
	B	1/4	252	3168	14160	12150	9900	6300						
	C	1/4	288	3620	16182	14400	12600	10300	6500					
	D	1/4	317	3985	17812	16200	14600	12700	10350	6700				
	E	1/4	363	4563	20397	19000	17600	16100	14500	12450	9600	4600		
B-48	A	1/4	431	5418	24218	23100	21900	20700	19500	18200	16600	14800	12600	
	B	1/4	492	6184	27548	26600	25600	24600	23550	22500	21400	20150	18600	

AUTHORIZED BY
AMCA

dimensional data - v-belt drive units

		UNIT SIZE									
		B-16	B-18	B-22	B-24	B-27	B-30	B-33	B-36	B-42	B-48
	dim.										
	a	34	34	44	44	55 1/2	55 1/2	62	62	76	76
	b	22 1/8	22 1/8	25 3/4	25 3/4	30 1/2	30 1/2	35 1/2	35 1/2	41 3/4	41 3/4
	c	2 1/2	2 1/2	2 1/2	2 1/2	3	3	3	3	3	3
	d	3	3	3 1/4	3 1/4	4 1/2	4 1/2	5	5	6 1/2	6 1/2
	e	27	27	33	33	39	39	45	45	57	57
	f	19	19	25	25	31	31	37	37	49	49
	h	17	17	23	23	27 1/2	27 1/2	34	34	44	44

fixed louvers

Standard

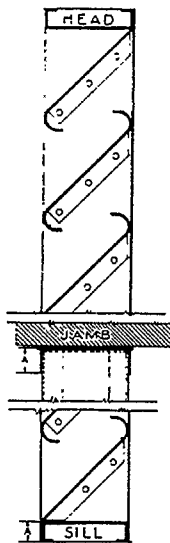


Fig. 3

Weatherproof

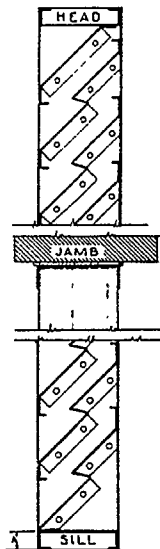


Fig. 8

Burt fixed type louver, Fig. 3. The sill and head are of formed flanged channel welded to channel formed jambs making a strong weatherproof basic frame. The blades are riveted to the jambs and are flanged on each side so that the blades overlap each other for weather protection. This type of frame provides adequate area for attaching screen.

For extreme weather conditions—where it is necessary to provide an air inlet, yet providing protection against wind driven rains, a fixed type louver, Fig. 8, may be used. The blades overlap each other and are designed with water stop projecting lips at center and top of each blade to stop the water from being driven up and over the blades by force of the wind.

Fig. 5 illustrates a simple form of adjustable louver with quad-

adjustable louvers

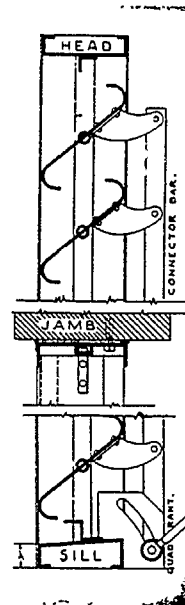
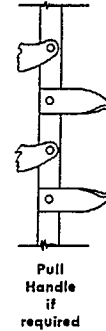


Fig. 5



Pull Handle if required

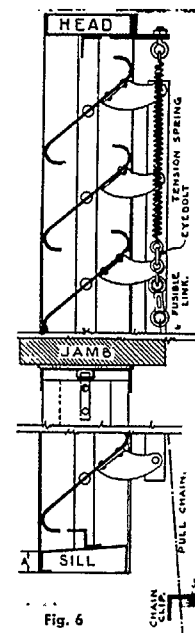


Fig. 6

rant and thumb screw fastener and may be used when the louver is within easy reach of the operator.

For operation of the blades a choice may be made of several types of operating or combination of operating mechanisms according to individual needs or building layout as shown in Figure 5, 6, 7 & 11.

Fig. 6 is typical of louvers that are placed in the wall out of reach and are operated from the floor by means of a chain pull, a clip being provided to retain the chain holding the louver blades in the desired open position. A spring is provided for positive return of the blades to the closed position when the chain is released and, by the addition of a fusible link, this type of operation provides automatic closing of the louver blades for fire protection.

Fixed Louver dimensional data

Figure 3					Figure 8	
Jamb width inches	3	4	5	6	3½	
Maximum width inches	48	96	96	96	96	
Maximum height inches	24	96	120	120	120	
Minimum height inches	12	24	60	60	12½	
Average blade spacing inches	3¼	4¼	5¼	6¼	3	
Frame dim. A inches	¾	1	1¼	1¼	¾	
Gal. steel gauge	22	20	18	18	Blades	Frame
Aluminum—gauge	20	18	16	16	22	20
Copper—ozs.	16	20	20	20	16	24
Protected metal—gauge	22	20	18	18	—	—
Stainless steel—gauge	22	20	18	18	22	20

Adjustable Louvers • Dimensional and construction data

Jamb width inches	3	4	5	6	Pivots†	Other parts
Max. width inches	48	72	72	72	....	....
Max. height inches	24	96	120	120	....	....
Min. height inches	12	24	60	72	..	....
Ave. Blade Spacing ins.	3¼	4¼	5¼	6¼	....	....
Frame dim. A inches	¾	1	1¼	1½	....	....
Galvanized steel gauge	20	18	18	16	Brass	Steel
Aluminum gauge	18	16	16	14	Aluminum	Aluminum
Copper—ozs.	16	24	*	*	Brass	Brass or Copper
Stainless steel gauge	20	18	18	18	Stainless Steel	Stainless Steel

† Oilite bearings can be used for pivot mounting when required.

* Maximum copper louver size 4 ft. W. x 8 ft. H.



wall
louvers

combination louvers

louver operators

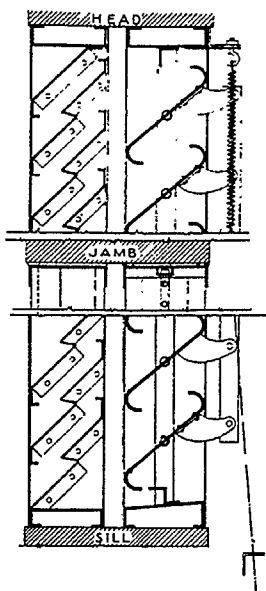


Fig. 9

A combination fixed and adjustable louver, Fig. 9 permits adjustment to meet air intake requirements and still affords protection against extreme weather conditions.

It consists of any combination of fixed louver, either Fig. 3 or Fig. 8 with any type of adjustable louver as shown in Figs. 5, 6 or 7, assembled at the rear of the fixed louver. It is preferred that a space be left between the two louvers.

Paint

When specified by the customer louvers can be painted at the factory with either a prime coat only or completely painted with primer and one or two coats of weather resisting paint.

When galvanized steel construction is to be painted it is strongly recommended that a priming coat of Zinc dust primer be used as the first coat. When specified any procurable paint can be applied in either air dried or baked on finish.

automatic louvers



Fig. 10

The Burt automatic louver Fig. 10 may be supplied in either a frame of structural angle or mounted in standard formed sheet metal as shown for the Burt fixed or adjustable louvers.

Blades are constructed of sheet aluminum and mounted in oilite bearings.

For equal opening the blades have an aluminum connector bar thus assuring that the blades will open in unison.

These louvers are excellent for fan intakes or discharge and when it is necessary the blades may be counter-balanced for the velocity pressure of the airstream.

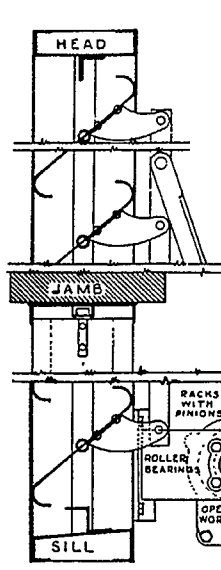


Fig. 7

Where a series of louvers are mounted in the wall it is often desirable to operate a number of them with one mechanism. Fig. 7 shows a louver with the blades connected by means of rack and pinions to a galvanized steel pipe shaft mounted on roller bearings and connected to a grease filled worm gear drive.

This may be operated either by a crank, a hand-wheel, or a chain wheel with chain carried to the operating point. For large series of louvers, motor operation can be used with remote control.

Fig. 11 illustrates the use of a damper type motor for the opening and closing of louver blades. This type is very convenient for remote control and also for use where the louver is to be operated in conjunction with a fan or other electrical apparatus.

All necessary bolts and nuts are shipped with the mechanical operators together with installation drawings.

screens

Screens are folded sheet metal construction and are removable from the louver.

Usually supplied in galvanized steel construction they may be made in any material procurable such as Aluminum, Stainless steel, Brass or Copper. Stock Screen is 16 mesh insect screen and $\frac{1}{2}$ " or $\frac{1}{4}$ " mesh bird screen. However, any procurable mesh can be supplied to customers specifications.

Large screens are supplied with a center reinforcing bar to give rigid construction.

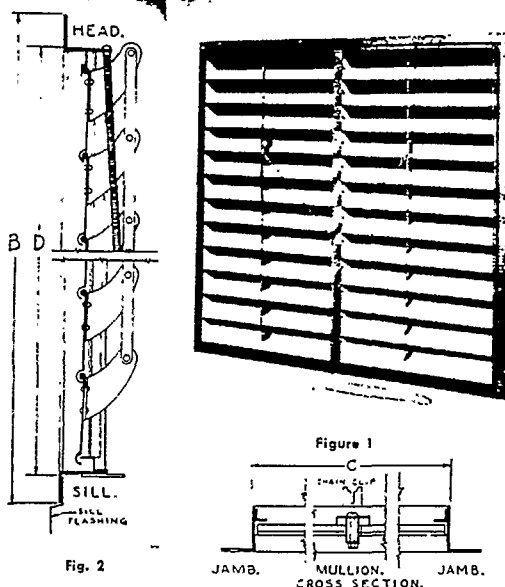
Screens woven into channel frames are also available.

FOR MORE COMPLETE DETAILS, WRITE FOR BULLETIN SPV-17

The Burt Manufacturing Company 15

USHO 003438

general purpose louvers



Standard sizes

Single row of Blades C=22 1/4"					Double row of Blades C=45 1/4"					Triple row of Blades C=68 1/4"				
Size No.	B	D	Sq. Ft. Net opening	Net Wt. lbs.	Size No.	B	D	Sq. Ft. Net opening	Net Wt. lbs.	Size No.	B	D	Sq. Ft. Net opening	Net Wt. lbs.
GL-1-2	11 3/4	9 1/4	1.0	13.5	GL-2-3	15 3/4	12 3/4	3.0	29.8	GL-3-4	19	16 1/2	6.0	43.5
GL-1-3	15 3/4	12 3/4	1.5	16.4	GL-2-4	19	16 1/2	4.0	34.3	GL-3-5	22 3/4	20 1/4	7.5	49.7
GL-1-4	19	16 1/2	2.0	19.3	GL-2-5	22 3/4	20 1/4	5.0	38.8	GL-3-6	26 1/4	23 3/4	9.0	55.9
GL-1-5	22 3/4	20 1/4	2.5	22.2	GL-2-6	26 1/4	23 3/4	6.0	43.3	GL-3-7	29 3/4	27 3/4	10.5	62.1
GL-1-6	26 1/4	23 3/4	3.0	25.1	GL-2-7	29 3/4	27 3/4	7.0	47.8	GL-3-8	33 1/4	31	12.0	68.3
GL-1-7	29 3/4	27 3/4	3.5	28.0	GL-2-8	33 1/4	31	8.0	52.3	GL-3-9	37 1/4	34 3/4	13.5	74.5
GL-1-8	33 1/4	31	4.0	30.9	GL-2-9	37 1/4	34 3/4	9.0	56.8	GL-3-10	40 3/4	38 1/4	15.0	80.7
GL-1-9	37 1/4	34 3/4	4.5	33.8	GL-2-10	40 3/4	38 1/4	10.0	61.3	GL-3-11	44 3/4	41 3/4	16.5	86.9
GL-1-10	40 3/4	38 1/4	5.0	36.7	GL-2-11	44 3/4	41 3/4	11.0	65.8	GL-3-12	48	45 1/2	18.0	93.1
GL-1-11	44 3/4	41 3/4	5.5	39.6	GL-2-12	48	45 1/2	12.0	70.3	GL-3-13	51 3/4	49 1/4	19.5	99.3
GL-1-12	48	45 1/2	6.0	42.5	GL-2-13	51 3/4	49 1/4	13.0	74.8	GL-3-14	55 3/4	52 3/4	21.0	105.5
GL-1-13	51 3/4	49 1/4	6.5	45.4	GL-2-14	55 3/4	52 3/4	14.0	79.3	GL-3-15	58 3/4	56 3/4	22.5	111.7
GL-1-14	55 3/4	52 3/4	7.0	48.3	GL-2-15	58 3/4	56 3/4	15.0	83.8	GL-3-16	62 3/4	60	24.0	117.9

Engineering Service

The Burt Manufacturing Company not only manufactures a full line of wall louvers for standard conditions, but is willing at all times to estimate costs of special louvers in any procurable material to architects or engineers designs.

Meeting the demands for an economical louver, a standard size 48" x 48" adjustable louver has been developed as shown in Fig. 1 and typical cross section in Fig. 2. Acceptance of this louver for prefabricated steel buildings and other applications where a standard size louver may be used have made this standard size louver a production line item which assures quality construction at a minimum cost.

Operation is by means of a pull chain with clip for positioning the blades for any desired opening and with spring attachment for positive closing of blades when the operating chain is released.

Size Modification

This louver can also be supplied in single, double or triple rows of blades with wall opening widths of 22 3/4 ins., 45 1/4 ins. and 68 1/4 ins. together with varying heights of wall opening as shown in the table below.

The dimensions as shown in the table must be adhered to as these louvers are a standard production line item with Burt high quality built in to their manufacture.

Construction

Frame 2" x 1 1/2" x 1/8" Steel angle.

Blades 20 ga. Galvanized steel.

Blade spacing 3 3/8 ins.

Blade pivots 3.16" dia. Steel running through blade end to end.

Burt facilities and equipment enable us to construct such units economically and to the general satisfaction of the customer.

Burt professional engineers will at all times be glad to be of service in matters pertaining to construction and engineering data involved in preliminary design and use.