ETHYL CORPORATION

INTER-OFFICE



To T. R. Robinson, M. D. Address BR Plant

From H. M. Taylor Address BR Tower

Subject Welding Fume in Maintenance Shops - Baton Rouge Plant - Preliminary Industrial Hygiene Report

Date September 21, 1973

While conducting the recent asbestos survey within the Baton Rouge plant, I was also requested to perform a preliminary industrial hygiene evaluation of ventilation in several maintenance shops. Plant supervision indicated there had been some employee concern about ventilation control of welding fume.

Please keep in mind that this was intended to be a preliminary survey, as such it is not necessarily complete. I'll be glad to discuss any questions concerning the evaluation. If a detailed industrial hygiene ventilation evaluation is desired or assistance to evaluate fan performance or noise from these systems, please let me know.

H. Taylor

HT:ws

cc: W. C. Strader
S. D'Armond
H. G. Borque
R. Conrad
J. Klock
W. E. Rinehart, Sc. D.

PRELIMINARY REPORT OF INDUSTRIAL HYGIENE SURVEY OF MAINTENANCE SHOP WELDING FUME VENTILATION

ETC 00121

F-06910

PRELIMINARY REPORT OF INDUSTRIAL HYGIENE SURVEY OF MAINTENANCE SHOP WELDING FUME VENTILATION

BATON ROUGE PLANT

Survey Conducted July 27, 1973
by

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REPORT FORMAT

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SUMMARY

1. When an industrial hygiene survey looking for potential health problems is made of a production facility, the initial approach is to look for adverse effects generally attributed to the chemical and physical agents used in the process observed. However, there has been a changing view of what constitutes an adverse effect and now concern has been directed to characterizing an irritating, stressful or otherwise uncomfortable work environment.

2. Although a complete indepth study was not made of environmental contaminants, there was no indication that a significant acute environmental health hazard was present at any of the locations visited.

3. There was no evidence of chronic environmental health hazard conditions. However, there was indication welding fume can accumulate in excess of OSHA standards in the north end of the sodium maintance shop on an intermittant basis.

Method and Rationale

Visible "smoke" was produced by forcing aspirated environmental air through a tube of stannic tetra-chloride. The artificial smoke was released in the shop areas of concern to stimulate welding fume. The observed effect of air movement upon this smoke was used as a guideline to form impressions regarding particular welding fume control situations.

After some experience, this method of ventilation evaluation provides a quick assessment of ventilation system performance. Often one can quickly determine where more exact data is required. In addition, such a demonstration provides a visable show for the doubtful that an effective system is effective, in spite of an occasional odor. In other situations, where fume control is obviously needed, further in depth evaluation often

does not provide information not already general knowledge.

Maintenance Shops

Sodium

This welding shop occupies the large open bay-type area on the second floor of the sodium maintenance shop. There are three, six bladed, window fan type air exhausters located in the wall at one end of the welding shop area. The main outside air supply to the building was found to enter the building by a large door way located on the first floor below the three exhausters.

Impressions

1. During the time of the industrial hygiene contact it was demonstrated the fume contaminated air from the second floor wall welding fume exhausters was returned into the building through the large first floor doorway mentioned previously. After entering the doorway, approximately 1/3 of the contaminated welding fume air passed to the second floor through a large opening located immediately inside the doorway. It then passed above one of the welders to again cycle through the wall exhausters. One consequence of using this ventilation system with continous welding production is that the "short cycled" fan air becomes more and more concentrated with welding fume while at the same time it becomes less fresh.
2. Most of the remaining 2/3 of the incoming air which entered the first floor doorway moved across the lower floor and up a stairway opening located at the end of the welding bay opposite and away from the second floor air exhausters. Most of this air, at the end away from the wall exhausters, moved further away because it was demonstrated this air leaves the area through a communicating passage or tunnel also located near the stairway.
3. The net effect produced by propelling air from one end of a work area and exhausting air from the opposite end of the same area is to create

a place somewhere in between where there is little or no air movement. This area was located approximately 20 feet from the wall fan exhausters. Incidentally, this is just the area where most of the heavy welding fume is produced in the shop.

4. To summarize:

   1. Welding fume is being recycled, this is not acceptable to OSHA*
   2. Welding fume is often not effectively exhausted, this is not acceptable to OSHA.**

Central Shop and R&D Shop, Impression

1. Preliminary industrial hygiene ventilation evaluations did not reveal welding fume accumulations which would constitute OSHA type deficiencies.

Maintenance Shops

Recommendations*** - Sodium

1. Welding fume in those areas of routine heavy fume production can be effectively controlled by using ducting systems and air movers of sufficient size to provide a capture velocity of greater than 100 feet a minute at the fume source. The captured fume should be transferred to an exhaust point where the fume will not return to the area. A manufacturers description of one such system is attached. It would be best if one of these POINT OF SOURCE exhausting systems is installed for each heavy production routine welding station in the area. (about three or four)

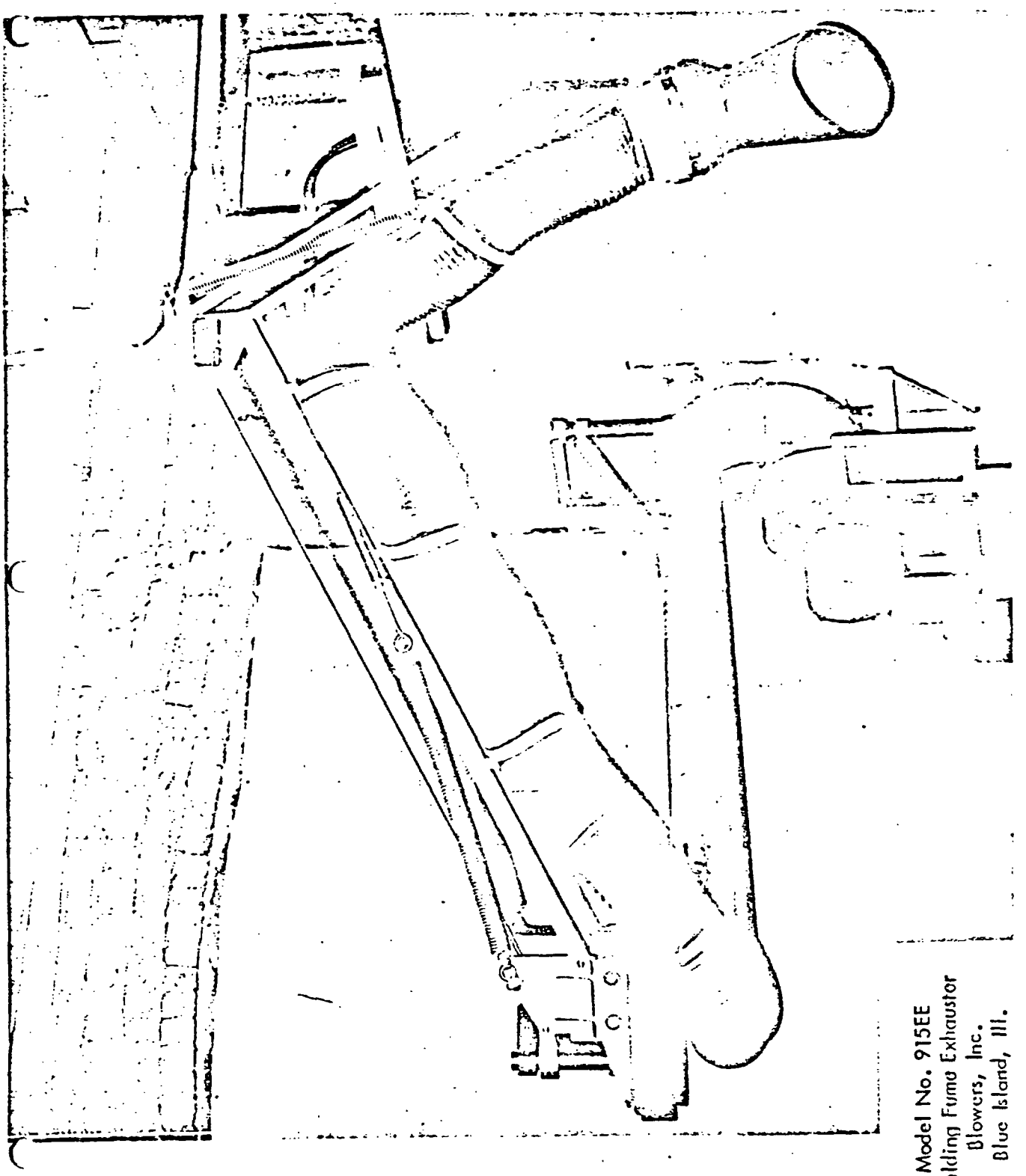
*"All air replacing that withdrawn shall be clean and respirable" 1910.252; F,4.

** This has the net effect of reclassifying the process area as a confined space and to require OSHA controls for confined space welding.

*** No recommendations are presented for central shops or R&D shop areas.

If you decide to persue this method of control, it is recommended someone also specify a maximum allowable noise exposure for fans and motors, since in the past, some of these systems haven't been used because of noise irritation.

2. It is also recommended that a motor be purchased with sufficient static pressure capability to move the exhausted air through a duct to a riser stack of some sort. The riser stack should be sufficiently high and out in the open to avert the present recycling problem.

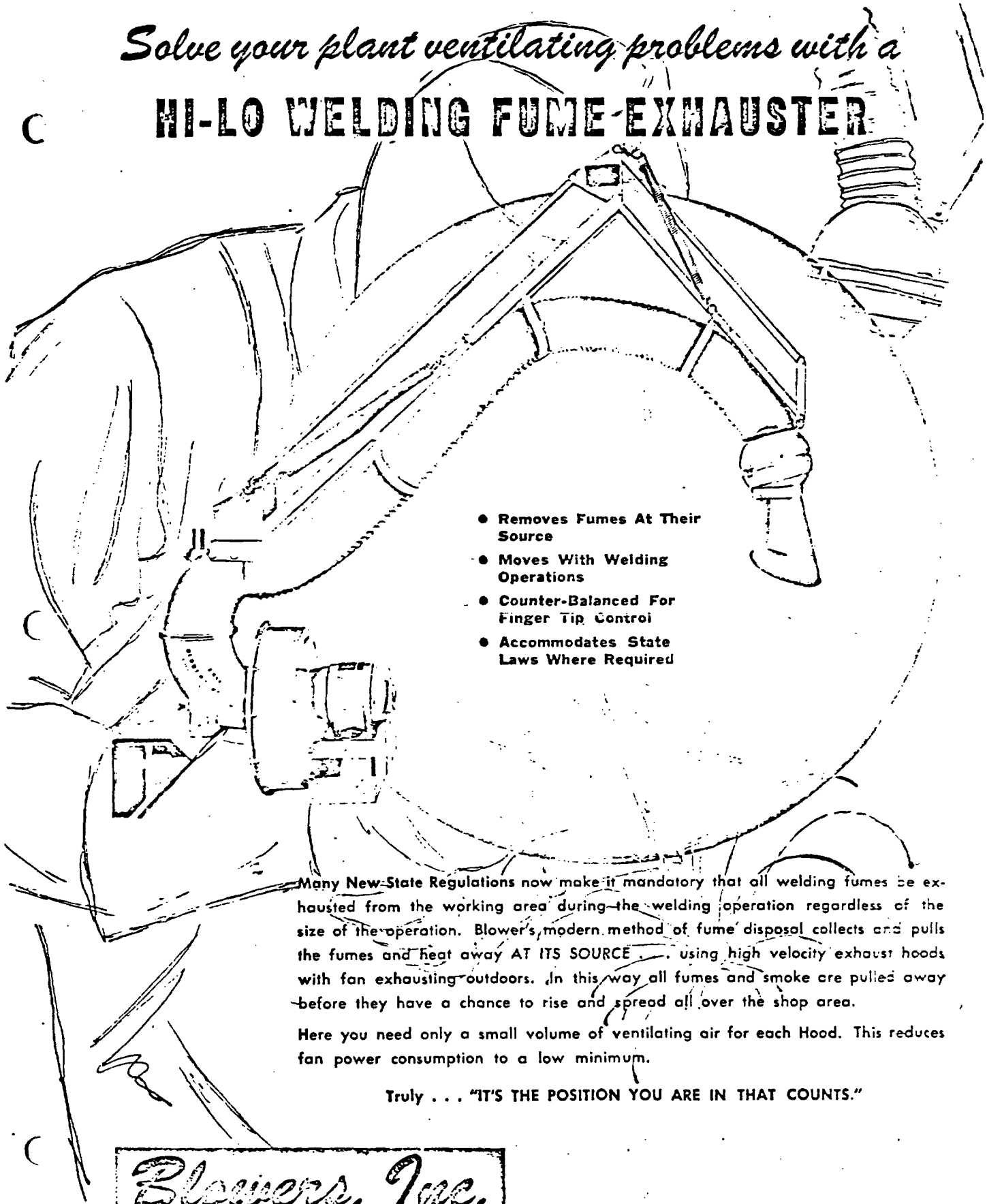


Model No. 915EE
Welding Fume Exhaustor
Blowers, Inc.
Blue Island, Ill.

E-06917

Solve your plant ventilating problems with a

HI-LO WELDING FUME-EXHAUSTER



- **Removes Fumes At Their Source**
- **Moves With Welding Operations**
- **Counter-Balanced For Finger Tip Control**
- **Accommodates State Laws Where Required**

Many New State Regulations now make it mandatory that all welding fumes be exhausted from the working area during the welding operation regardless of the size of the operation. Blower's modern method of fume disposal collects and pulls the fumes and heat away AT ITS SOURCE . . . using high velocity exhaust hoods with fan exhausting outdoors. In this way all fumes and smoke are pulled away before they have a chance to rise and spread all over the shop area.

Here you need only a small volume of ventilating air for each Hood. This reduces fan power consumption to a low minimum.

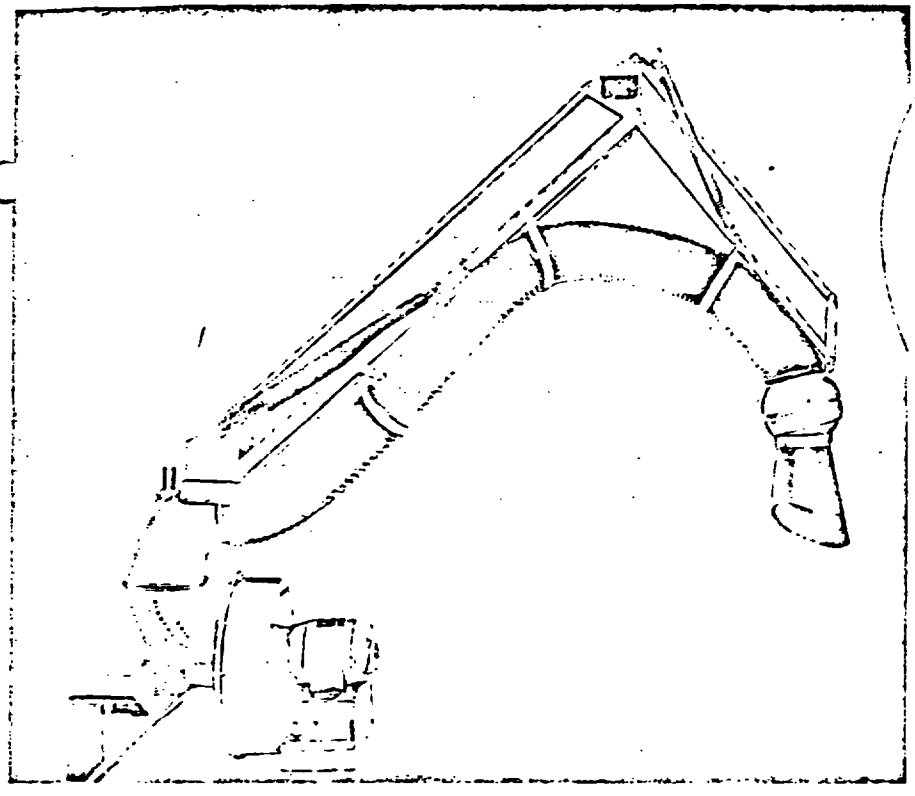
Truly . . . "IT'S THE POSITION YOU ARE IN THAT COUNTS."

Blowers, Inc.

BLUE ISLAND, ILLINOIS

F-06918

ETC 00129



There is a

HI-LO WELDING FUME EXHAUSTER

to fit every plant

Model 813-E (left) Exhauster Fume Collector. (Shown with blower fan.) Note extreme range of Hood for welding position use. The full circle rotation of hood and flex hose on rotatable elbows . . . the finger-tip control counter balance of the adjusting balance structure arms that hold at any desired position for efficient operation.

Keep your shop clean! Improve operators' effic

Wherever there is smoke or fumes -- over, arou

in your work the HI-LO quickly gets rid of it!

Collects Fumes at Source - - Wide Positions - - Minimum Heat Loss -

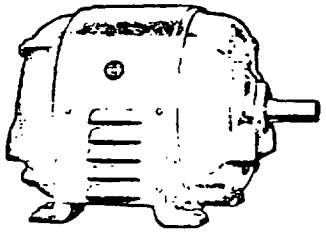
Fumes Collected at Source: Because this collector has almost universal flexibility the rotatable exhaust Hood can be placed in the best position to effectively collect welding fumes. Hood (made of insulating material) may be placed 18 inches diagonally above the arc and so ventilate many welding operations without Hood movement. No Fumes escape into general shop area.

Unlimited Working Range: Model 813-E moves on a 9 foot horizontal radius. Vertical range extends to about 11 feet above floor. (Note diagramatic sheet for details.)

Workmanlike Construction: All exhausters are designed and manufactured under careful specifications to meet rigid industrial as well as government requirements. Rotatable elbows are made of heavy cast material mounted on steel brackets. These support the counterbalance arms made of structural steel and connect to the 6 inch flame proofed retractable Hose and Ball Jointed exhausting Hood.

Low Maintenance Costs: Use of a minimum of working parts insures low maintenance cost and longer product life.

Simple Installation: Wall bracket support accompanies each unit. Simple installation data and instructions are included. Each unit fully assembled. Fan and Motor platform furnished at extra cost when desired.

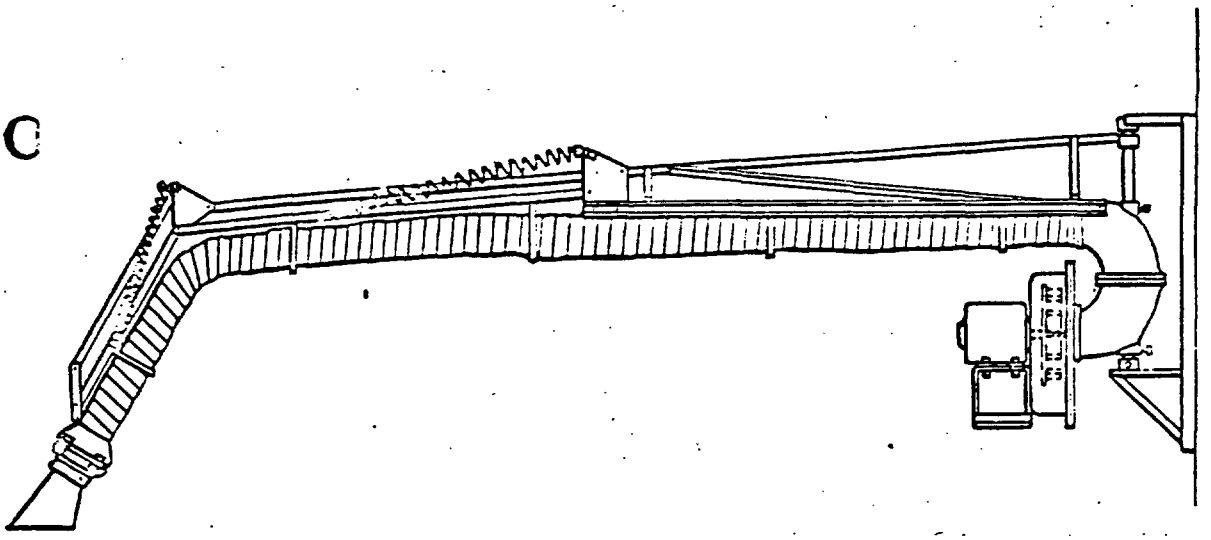


Exhaust Fan and Motor

Blower's general exhauster or blower fans are available in all sizes to produce most needed air volumes and pressures. In either belt or direct drive all motors are ball bearing U. S. Electric types. With proper selection multiple installations of exhausters to one blower fan can be made. Engineering advice is available as a Blower service wherever needed.

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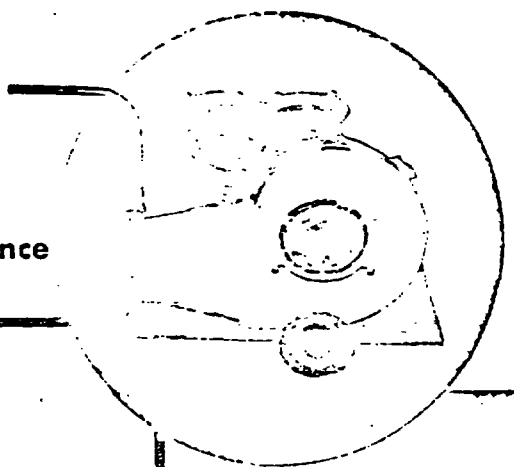
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Model 913-E Long Arm extention Exhauster Fume Collector. Extra sturdy industrial construction of this special unit assures ease of operation at 15 feet distance of hood at the maximum height of operation. Extra heavy support of wall bracket assures effective needed support for heavy volume exhausting of fumes at full range. Fire proofed 6 inch flex hose and adjusting rotating hood make possible the same low power consumption as Model 813-E.

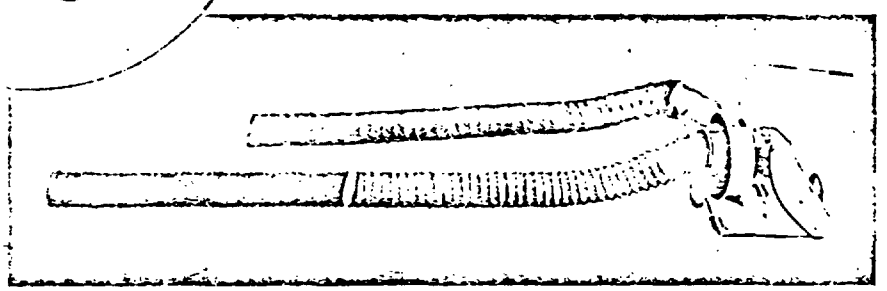
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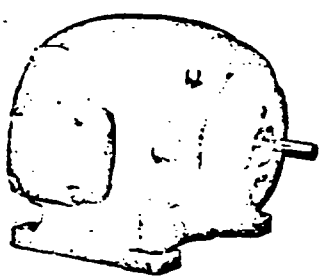
ange of Hood
Low Maintenance



Light weight, portable model of sturdy aluminum construction with self-locking wheels, ideal for inaccessible ventilating.

Model 850-E . . Portable Exhauster Blower accommodates multiple lengths of flex-hose—10 ft. each with quick coupling attachments.
Basic for mine exhausting or where exhausting problems in deep well or hole is essential. 220 Volt A. C., 60 Cycle, 1 H.P., 3600 PRM.





Motors and blowers available for any exhausting requirement: fumes - grinders - dust - smoke. Write for additional information or for specifications to fit your plant's needs.

F-06920

ETC 00131