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Medical Division, The B. F. Goodrich Co., Akron, Ohio

WITH SAFETY

RESPIRATORS AND GAS MASKS

by the U. S. Bureau of Mines. A commercially available type of this device is shown in Fig. 2.

3. Compressed air (air line) Respirators. See Table 3.

This is probably the most commonly used Supplied Air Respirator. An illustration of it is shown in Fig. 3. It consists of a facepiece covering which may be of either the full or half mask type, a high pressure air supply system, a short hose connecting the face piece to the air supply, and a detachable coupling with a suitable reducing valve. These devices are intended for non-emergency use and should not be used under any circumstances in atmospheres which may be immediately dangerous to life. They will give protection against all of the various atmospheric contaminants. Their proper operation depends upon providing an adequate supply of high pressure air to the wearer in amounts somewhat in excess of his breathing requirements. This means that at all times excessive air should be flowing through the exhalation valve or about the periphery of the face piece. These devices are termed Type C Supplied Air Respirators by the U. S. Bureau of Mines. They are approved for various lengths of hose up to a maximum of 250 feet. It is obvious, of course, that the air supply to this device must receive special attention. It is the responsibility of the user rather than the manufacturer of the device to provide a proper air supply. The Bureau of Mines approval requires that no pressure in excess of 25 lbs. per sq. inch gauge be used on these devices. Most of the manufacturers of this type of respirator provide a small activated carbon filter in the air supply line near the detachable coupling. The purpose of this is to remove small quantities of *(To page 30)*

Table 2
Hose Mask without Blower

Name of Respirator	Approval Number	Date of Approval
1. Davis air-line mask	1913	March 10, 1939
2. Bullard Simplex hose mask	1916	October 14, 1939

Table 3
Airline Respirators

Name of Respirator	Approval Number	Date of Approval
1. M.S.A. air-line respirator	1909	July 15, 1938
	1909A	May 19, 1947
2. Willson air-line respirator (GA, GB, GC)	1912	Oct. 7, 1938
3. Cesco direct air mask (#602)	1917	Aug. 17, 1940

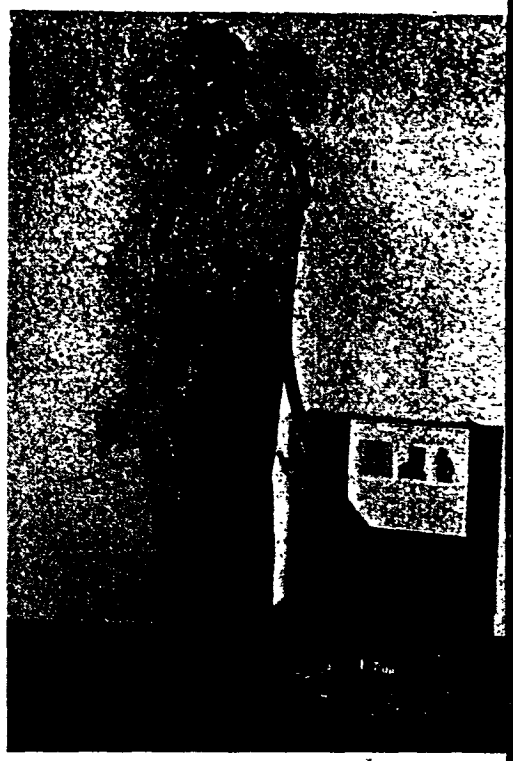


Figure 2—Hose mask without blower (# 1913).

FEATURE



This is the second of a consecutive series of three major articles dealing with Respiratory Protection. The third feature of the series will appear in the February 1949 issue of SAFETY ENGINEERING.



Figure 3—Type C supplied air respirator (# 1909).

to replace the canister at the first signs of the passage of the contaminated gas or vapor into the face piece as evidenced by eye or respiratory irritation or odor. A supply of fresh canisters should be at all times available for replacement purposes. Where protection against only a specific gas or gases is desired this is the mask to be chosen. It is shown in Fig. 5.

2. Those intended for protection against all gases, including carbon monoxide, and limited protection against smoke. See Table 6.

These gas masks are now termed the Universal Type (see Fig. 6). The canister consists of various sorbents arranged in layers to provide the maximum amount of protection to the wearer against all toxic gases and vapors. Inasmuch as carbon monoxide possesses no warning properties, a small timing device is incorporated in masks of this type to enable the wearer to determine the time for canister replacement. These canisters are ordinarily designed for two hours of normal usage. This time, of course, may be increased or decreased depending upon the conditions under which it is worn and the volume of air which passes through it. They are approved for a maximum concentration of 2% by volume of all of the contaminants with the exception of ammonia for which the maximum limit is 3%. These canisters will also afford respiratory protection against smoke from ordinary fires and limited protection against dusts, fumes, and mists. They do not, however, afford adequate pro-

Table 5
Gas Masks for Specific Gases

Name of Mask	Approval Number	Date of Approval
Type A: Acid Gas Masks		
a. Hydrocyanic Acid (Canister Color: White with Green Stripe)		
1. M.S.A. hydrocyanic acid gas mask.	1413 (regular-size canister)	Dec. 9, 1933
	1414 (super-size canister)	Dec. 9, 1933
2. Davis hydrocyanic acid gas mask ..	1424	Dec. 11, 1939
3. Willson hydrocyanic acid gas mask [1]	1428	Aug. 30, 1940
4. Bullard hydrocyanic acid gas mask.	1431	Feb. 10, 1941
[1] An extension of approval 1428 was issued May 20, 1947 to E. D. Bullard Co.		
b. Chlorine Gas (Canister Color: White with Yellow Stripe)		
1. Acme chlorine gas mask.....	1421	April 21, 1939
2. M.S.A. chlorine gas mask	1422	May 26, 1939
3. Willson chlorine gas mask [1].....	1426	March 8, 1940
4. Davis chlorine gas mask	1427	June 26, 1940
5. Bullard chlorine gas mask	1430	Feb. 10, 1941
[1] An extension of approval 1426 was issued May 20, 1947 to E. D. Bullard Co.		
Type B: Organic Vapor Mask (Canister Color: Black)		
1. M.S.A. organic vapor mask	1415	July 28, 1936
2. Davis organic vapor mask	1417	May 3, 1938
3. Acme organic vapor mask	1418	May 13, 1938
4. Bullard organic vapor mask.....	1419	July 15, 1938
5. Willson organic vapor mask [1].....	1423	Oct. 6, 1939
6. Willson organic vapor mask [2].....	1437 (large-size canister)	Aug. 5, 1944
7. M.S.A. organic vapor mask	1441 (super-size canister)	Aug. 2, 1946
[1] An extension of approval 1423 was issued May 20, 1947 to E. D. Bullard Co. [2] An extension of approval 1437 was issued May 20, 1947 to E. D. Bullard Co.		
Type AB: Acid Gas and Organic Vapor Masks (Canister Color: Yellow)		
a. Acid Gas and Organic Vapor		
1. M.S.A. acid gas & organic vapor..	1409	Jan. 23, 1930
2. Davis acid gas & organic vapor...	1411	Jan. 19, 1931
b. Hydrogen Sulfide and Petroleum Vapor		
1. M.S.A. hydrogen sulfide & petroleum vapor	1410	July 16, 1930
2. M.S.A. hydrogen sulfide & petroleum vapor	1412	Sept. 14, 1931
3. M.S.A. hydrogen sulfide & petroleum vapor	1416	June 16, 1937
	1416A	July 1, 1937
Type C: Ammonia Gas Masks (Canister Color: Green)		
1. M.S.A. ammonia gas mask [1] .	1401	April 10, 1920
2. M.S.A. ammonia gas mask	1404	March 10, 1926
3. M.S.A. ammonia gas mask [4, 5].	1406	Feb. 14, 1928
4. Davis ammonia gas mask [2, 3]	1408	Dec. 19, 1928
5. Acme ammonia gas mask	1420	March 25, 1939
6. Willson ammonia gas mask [6].....	1425	Dec. 20, 1939
7. Bullard ammonia gas mask ..	1429	Feb. 10, 1941
8. Willson ammonia gas mask (large canister) [7]	1438	Sept. 22, 1944
9. M.S.A. ammonia gas mask (super-size GMD canister)	1442	Aug. 29, 1946

[1] An extension of approval 1401 was issued June 23, 1927 to American-La France & Foamite Industries, Inc.
[2] Originally issued to Bullard-Davis, Inc., later transferred to Davis Emergency Equipment Co., Inc.
[3] An extension of approval 1408 was issued Nov. 18, 1930 to American-La France & Foamite Industries, Inc.
[4] An extension of approval 1406 was issued May 17, 1938 to B. F. McDonald Co.
[5] An extension of approval 1406 was issued Feb. 20, 1946 to American-La France & Foamite, Inc.
[6] An extension of approval 1425 was issued May 20, 1947 to E. D. Bullard Co.
[7] An extension of approval 1438 was issued May 20, 1947 to E. D. Bullard Co.



Fig. 5—Industrial gas mask (# 1423) designed for protection against a specific type of vapor.



Figure 6—A universal gas mask (# 1405). Note timing device immediately above the canister.