

**Instruction Manual**  
**for**  
**Navy Oxygen Rescue Breathing Apparatus**  
**Type A-1**

*The contents of this Manual must not be revealed  
to any person unauthorized to receive the information.*

INSTRUCTIONS  
for  
PROPER USE AND MAINTENANCE OF NAVY  
OXYGEN RESCUE BREATHING APPARATUS-TYPE A-1



FIGURE 1  
NAVY OXYGEN RESCUE BREATHING APPARATUS-TYPE A-1

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## INTRODUCTION

The apparatus described and illustrated in this pamphlet is known as the Navy Oxygen Rescue Breathing Apparatus-Type A-1. It is a self-contained apparatus and operates independent of the outside air. In these respects it is similar to the conventional type of oxygen rescue breathing apparatus. In other respects it is radically different. The conventional type of apparatus employs a compressed oxygen cylinder as a source of oxygen for breathing requirements and a compartment filled with chemical for absorbing the carbon-dioxide contained in the exhaled breath. The conventional type also requires and is fitted with a reducing valve, by-pass tubing and valve, high pressure fitting, oxygen admission valve, etc., resulting in a complicated device necessitating extensive training in its use. The Navy Oxygen Rescue Breathing Apparatus-Type A-1 described herein employs a canister filled with a special chemical which absorbs carbon-dioxide and simultaneously evolves sufficient oxygen for the wearer's respiratory requirements, thus permitting the elimination of the complicated parts of old type apparatus. Instructions for its use and maintenance follow.

## DESCRIPTION OF APPARATUS

The Navy Oxygen Rescue Breathing Apparatus-Type A-1, is a self-contained oxygen generating breathing apparatus designed to protect the wearer in any atmosphere that is irrespirable due to presence of harmful gases, vapors, dusts and smokes or a deficiency of oxygen. It is entirely self-contained and its operation is independent of any outside air; the wearer breathes in a closed system which forms a circuit within the apparatus. The exhaled breath which contains carbon-dioxide is purified of this gas and replenished with oxygen by passing through a chemical and is then rebreathed.

The complete apparatus is shown in FIGURE 1.

FIGURE 2 shows complete apparatus adjusted to the body of the wearer and ready for service.

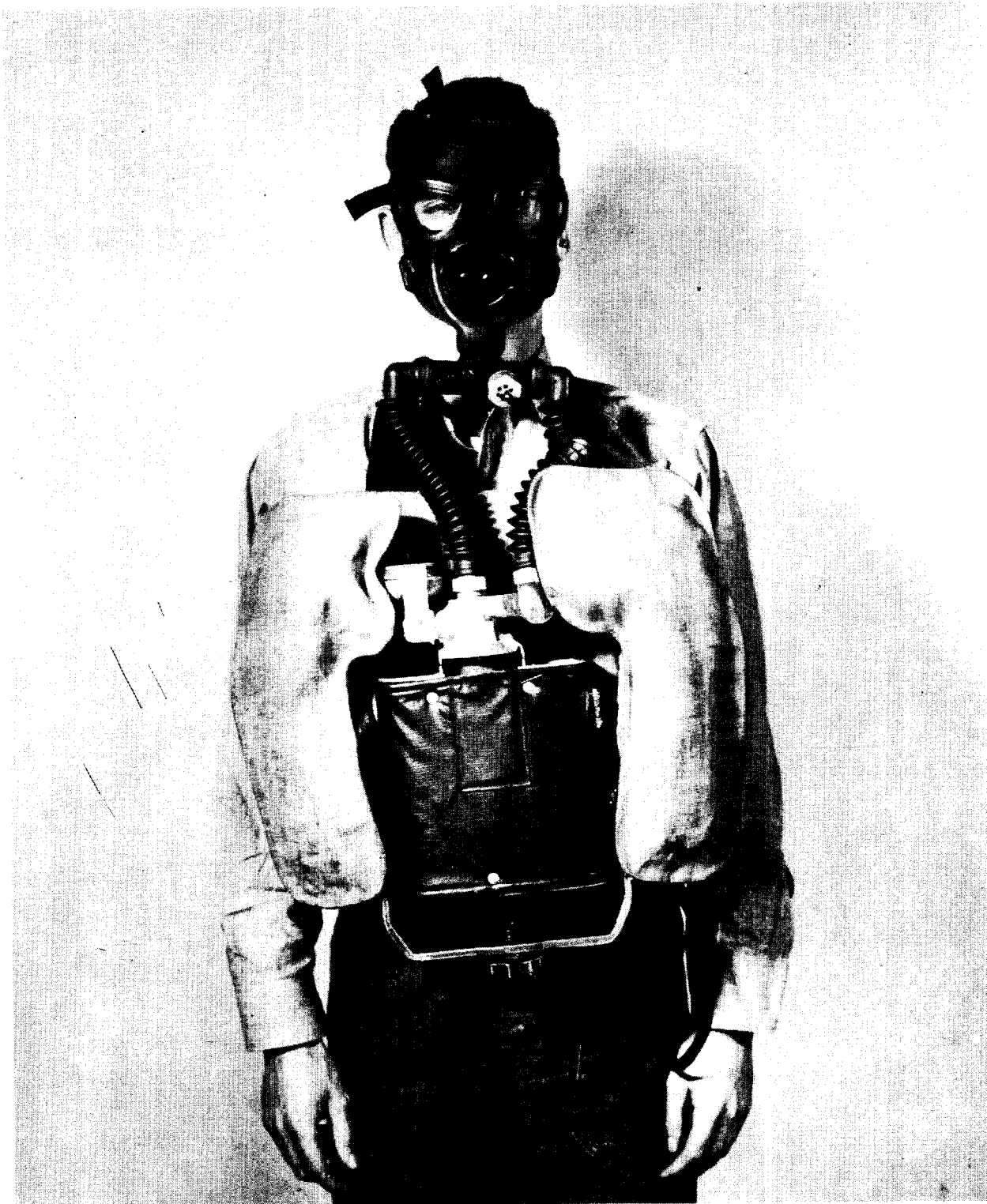


FIGURE 2

APPARATUS READY FOR SERVICE

Pictures of the various parts which make up the apparatus together with their corresponding names and identification numbers are shown in detail on pages 33 and 34. An assembly drawing of the complete apparatus is also provided at the rear of the manual on pages 28 and 29.

The Speaking-Diaphragm Facepiece is similar in design to that of the U. S. Navy ND Mark III Gas Mask except that a rubber mouthpiece is assembled to the snout opening. The facepiece valve assembly, which is located immediately below the speaking diaphragm, is equipped with a starter valve to permit air to be drawn from the surrounding atmosphere for the wearer's respiration while he is inflating the breathing bag. This assembly also contains the removable exhalation and inhalation valves which direct the flow of air through the apparatus (See FIGURE 3). The latter valves are designed to control the directional flow of the exhalations and inhalations into and from the apparatus. Thus the valve arrangement, as shown in FIGURE 3, provides circulatory breathing through the apparatus and purifying canister, and thus prevents rebreathing of the exhaled breath before it has been purified and replenished with oxygen.

The chemical contained in the canister purifies the exhaled breath of the wearer by absorbing the carbon-dioxide and at the same time generating oxygen for normal and comfortable breathing. The resultant chemical action liberates considerable heat in the canister. However, owing to the design of and insulation provided on the canister guard and breast plate, the wearer is fully protected from the heat. The breathing bag serves as a reservoir for the evolved oxygen and at the same time, due to its large surface area, provides an adequate cooling medium for the heated air coming from the canister.

The chemical in the canister contains a high percentage of oxygen which is liberated on contact with moisture; the rate of release being governed by the amount of moisture introduced. For breathing purposes, the water vapor in the



exhaled breath is sufficient for this purpose. Any excess moisture such as water will cause a sudden reaction and a rapid liberation of oxygen. Therefore, do not introduce water into either unused or used canisters.

It is a well-known fact that oxygen in contact with oil is explosive. This is true of the oxygen confined in this chemical as it is with gaseous oxygen confined in cylinders. Personnel should be warned not to use oil or grease of any kind on the apparatus or the canister and never to introduce oil or any foreign matter in the canister. Spare canisters should be stowed horizontally and remain sealed until required for use. Spent canisters should be thrown overboard. If oil slicks are present on the water, disposal overboard should be deferred until the ship is underway. DO NOT THROW SPENT CANISTERS IN BILGES OR ANY SPACES WHICH MAY CONTAIN OIL OR OIL AND WATER.

The harness consists of straps of strong black cotton webbing and suitable hardware which permits its use as a safety belt. For attachment of a lifeline, a substantial D ring is assembled to the harness where the shoulder straps cross on the back of the wearer.

The service time or life of a canister depends upon the extent of the wearer's exertions. The amount of chemical in the canister and its characteristics are such that it will ordinarily last one hour with intermittent hard work. If the work is continuous and extremely strenuous, this time will be reduced accordingly. Under such conditions the life of the canister may be reduced to 30 minutes. In any event approach to the end of its useful life will be evidenced by a noticeable resistance to exhalations which should be construed by the wearer as a warning to leave the compartment or space in which he is working.

(NOTE: Increased resistance to exhalations will also be noted when the breathing bag is overinflated. However, this condition may be relieved by depressing the

starter valve for a half of one exhalation. If considerable resistance to exhalations is still present, the canister is expended.)

To indicate the length of time the canister has been in service and when it must be replaced with a fresh canister, a timer is provided in a position easily visible at all times to the wearer, and indicates the end of a previously set interval of time by the ringing of a bell. The dial of the timer is calibrated in minutes and provides interval settings up to sixty minutes. It is recommended that the pointer of the dial be set at 30 minutes rather than 60 when donning the apparatus. If at the end of 30 minutes there has been no noticeable increase in resistance to exhalations, the timer may be set for an additional 15 minutes prior to returning to fresh air to replace the exhausted canister with a new one. By turning the pointer of the dial clockwise to the number corresponding to the number of minutes in the interval to be timed, the timer is automatically wound, and if left untouched, will unwind with continuous movement of the pointer to zero. When the pointer reaches the zero mark, the end of the interval is indicated by the alarm bell.

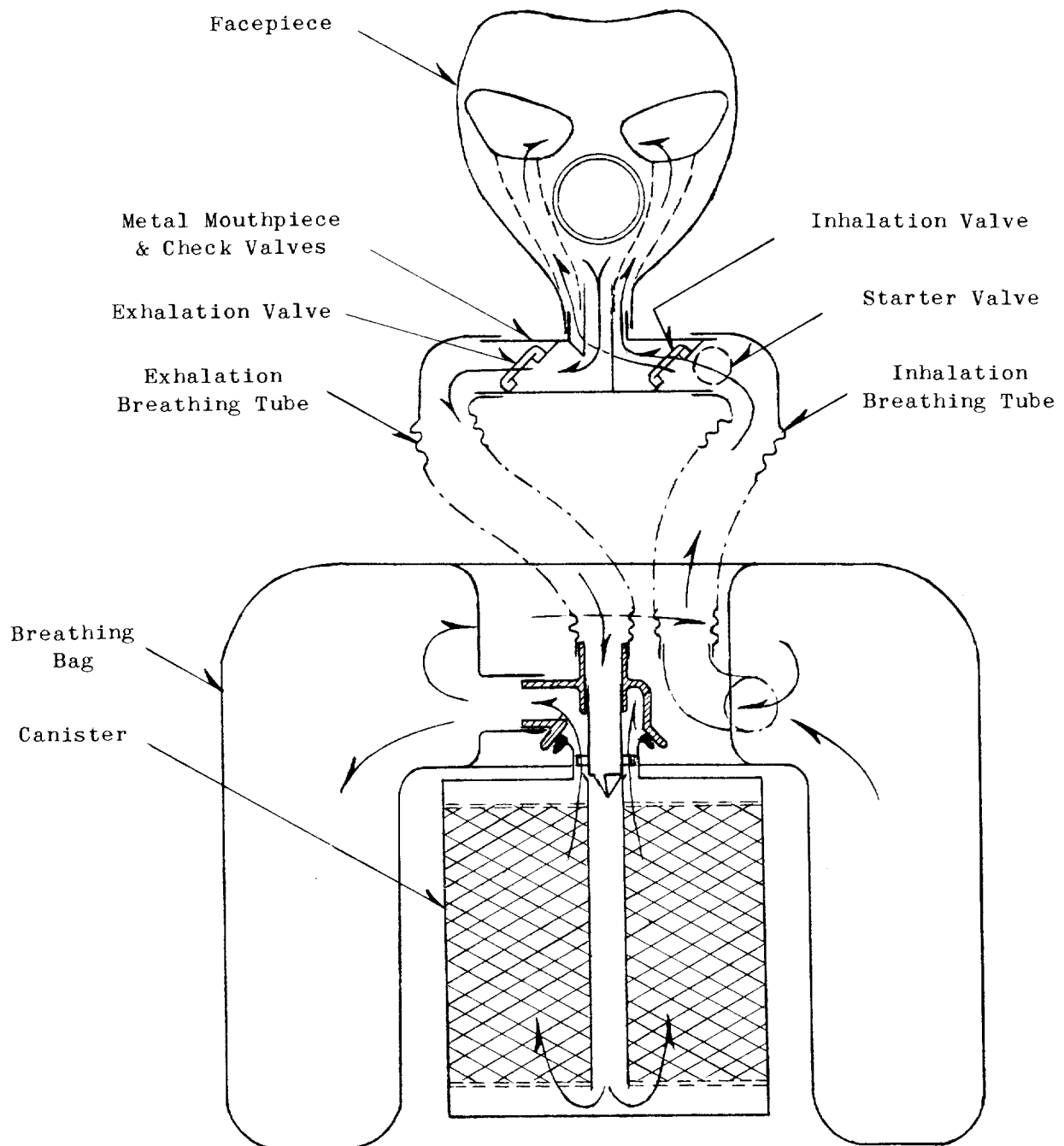


Figure 3

AIR FLOW DIAGRAM WITH CANISTER IN PLACE

FIGURE 3 is a diagrammatic sketch of the apparatus that shows the flow of air through the apparatus. Beginning with the speaking diaphragm type face-piece and following the arrows, the exhaled air flows through the exhalation valve and left breathing tube, as viewed in FIGURE 3, into the canister, passing to the bottom of the canister through a tube located in the center. From the bottom of the canister the air passes upward through the layer of chemical surrounding the center tube. It is while passing through the chemical that the carbon-dioxide is removed from the exhaled breath and the oxygen replenished. Upon leaving the canister, the air passes into the left side of the breathing bag as viewed in FIGURE 3, and thence through the back portion of the bag into the right side from which it is inhaled by the wearer through the inhalation breathing tube.

The rubber breathing bag serves as a flexible external lung and as a reservoir for the storage of respirable air for breathing requirements.

The surface of the breathing bag acts as a cooling medium and the circulatory path of the air through it reduces the temperature of the air to that comfortable for breathing.

The canister (FIGURE 4) is closed with a protective cap over an airtight metallic foil seal in the neck of the canister. New apparatus are shipped with one canister inserted in the apparatus. This canister carries a label "REMOVE TEAR-OFF CAP", and the canister should be removed immediately from the apparatus. The tear-off cap has been left in place to insure greater safety for the apparatus and canister in transit. To prepare the canister for use, the cap

only is removed by pulling the metal strip that extends beyond the edge of the cap straight out and then straight back across the top of the cap. The canister is then placed in the canister guard with the opening upward and with the "bulged" side away from the wearer. This is done by swinging the bail outward enough to permit the canister to enter the canister guard and by inserting the canister until it is engaged by the canister stop which is located on the left side of the guard. The bail is then swung back under the canister and the handwheel turned clockwise until the canister is held firmly, but not too tightly, in place. The apparatus is now ready for "STAND-BY" service without the metallic foil seal in the neck of the canister being punctured (FIGURE 8).

Should occasion arise for actual use of the apparatus, the wearer must turn the handwheel counterclockwise for one half turn to release pressure on the stop and depress the canister stop. He then turns the handwheel clockwise with the stop depressed until the canister gasket is firmly seated against the V-shaped recess in the plunger housing (FIGURE 9). The canister is now in "OPERATING" position. This action seals the apparatus against the entrance of any outside air at the canister neck and forms a closed circuit between the facepiece and the breathing bag.

After slipping on the facepiece, (FIGURE 10) the breathing bag should be inflated by means of the starter valve which is located on the front side of the facepiece valve assembly. This procedure is described under "Detailed instructions for use".

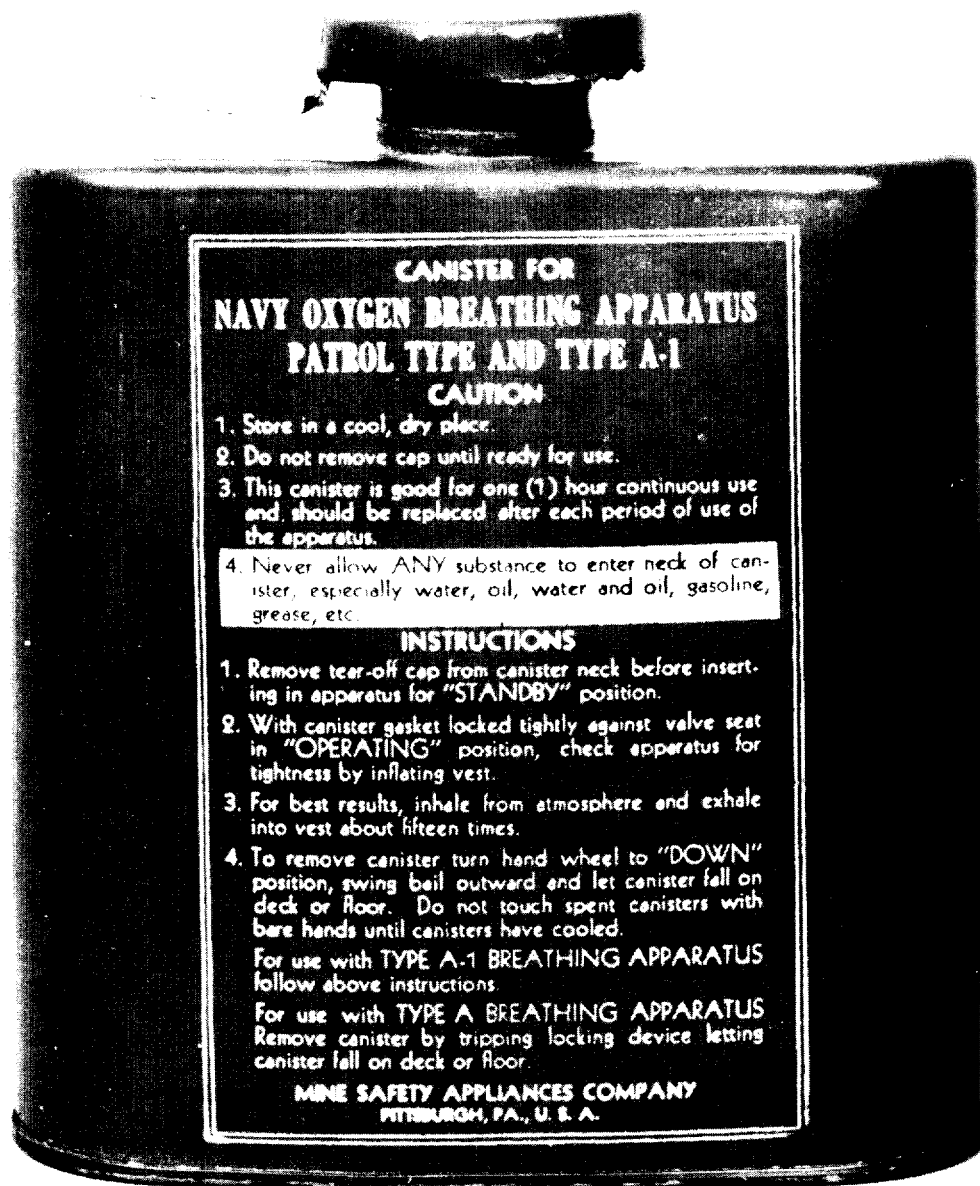


FIGURE 4

CANISTER

Upon expiration of the service time of the canister (see page 6), the wearer must return to fresh air. After returning to fresh air, remove the spent canister by turning the handwheel counterclockwise to the extreme "DOWN" position, depress the canister stop and with a quick forward motion, swing the bail from under the canister. The canister will then fall out of the guard (FIGURE 12). Since the canister is hot, due to the reaction of the chemical therein, it should not be touched without adequate protection for the hands. The canister stop will return automatically to position for the next period of service.

## DETAILED INSTRUCTIONS FOR USE

Persons who have occasion to wear the Navy Oxygen Rescue Breathing Apparatus, Type A-1, must become thoroughly acquainted with its principle of operation and the proper procedure for wearing it prior to its actual use in service. The apparatus should be worn and the necessary operations frequently practiced by the prospective wearer under the supervision of a person thoroughly trained in the operations necessary for the use of the apparatus. It should be remembered that this apparatus is designed to protect the respiratory system of the wearer from dangerous atmospheres and that the very life of the wearer may depend upon following the correct procedures in using the apparatus.

The following are the essential consecutive steps in donning and wearing this apparatus:

- 1-Before donning the apparatus, unfasten and straighten all harness straps.
- 2-With one hand grasp the apparatus by the central casting, dropping facepiece over the hand holding apparatus. With the other hand grasp the D-ring assembly, put the breast plate of the apparatus on the chest and the head through the V-shaped opening formed by the crossing of the two straps attached to the breast plate. See FIGURE 5.
- 3-Continue to hold the apparatus on the chest with one hand and with the other reach around to the rear at one side and grasp the free end of the harness strap that passes over the shoulder of the opposite side. Bring the end of this strap beneath the armpit and snap into the metal D-ring located on the top side of the breast





FIGURE 5  
DONNING THE APPARATUS

plate. This is the same D-ring to which is attached the other end of the opposite strap. Repeat this procedure for the other strap.

4-Adjust the position of the apparatus on the body by means of the metal slides located on the harness straps. The position of the apparatus on the body should be such that when the facepiece is placed on the face the breathing tubes will permit the greatest freedom of movement of the head.

5-Attach the waist strap to the small D-rings on each lower side corner of the breast plate and adjust to hold the apparatus snugly to the body.

6-To place canister in apparatus, (See FIGURE 7), first remove the metal protective cap and expose the metallic foil seal in the neck. This is done by pulling the metal tab straight out and then straight back across the top of the cap (FIGURE 6). Then, with handwheel in extreme "DOWN" position, swing bail outward far enough to permit canister to enter canister guard. Insert canister with neck up. After canister hits canister stop, swing the bail back in place under the canister and turn handwheel clockwise until canister is locked firmly, but not too tightly, in place. The Apparatus is now ready for "STAND-BY" service (FIGURE 8). BEFORE INSERTING CANISTER MAKE SURE THAT PROTECTIVE TEAR-OFF CAP HAS BEEN REMOVED.

7-"OPERATING" position of apparatus. To obtain this active service condition, the wearer momentarily releases the pressure on the canister by turning the handwheel counterclockwise approximately one half turn with his right hand, and with his left hand he pushes



FIGURE 6

REMOVING SEAL FROM CANISTER

the canister stop on the left hand side of the guard in as far as possible. He then turns the handwheel clockwise until the canister gasket is firmly seated against the V-shaped recess in the plunger housing (FIGURE 9).

8-With the apparatus properly and comfortably positioned and with the head harness straps properly in place through the buckles of the facepiece, slip on the facepiece and adjust the head straps to fit the face and head size of the individual wearer. (See FIGURE 10).

To obtain a firm and comfortable fit against the face at all points, adjust headbands as follows:

- (a) See that straps lie flat against head.
- (b) Tighten lower or "neck" straps.
- (c) Tighten the "side" straps. (Do not touch forehead or "front" straps).
- (d) Place both hands on headband pad and push it toward the neck.
- (e) Repeat operations (b) and (c).
- (f) Tighten forehead or "front" straps.
- (g) Test for tightness of facepiece by pinching both breathing tubes and inhaling. (See FIGURE 13) CAUTION: DO NOT ATTEMPT TO USE ANY TYPE FACEPIECE WITH THIS APPARATUS OTHER THAN THE ONE FURNISHED WITH THE APPARATUS.

10-With facepiece in position, grasp both breathing tubes with right hand, squeeze tightly, depress starter valve and inhale, then release starter valve and tubes and exhale into apparatus (FIGURE 11). Repeat this for a total of fifteen (15) complete respirations in order to inflate the

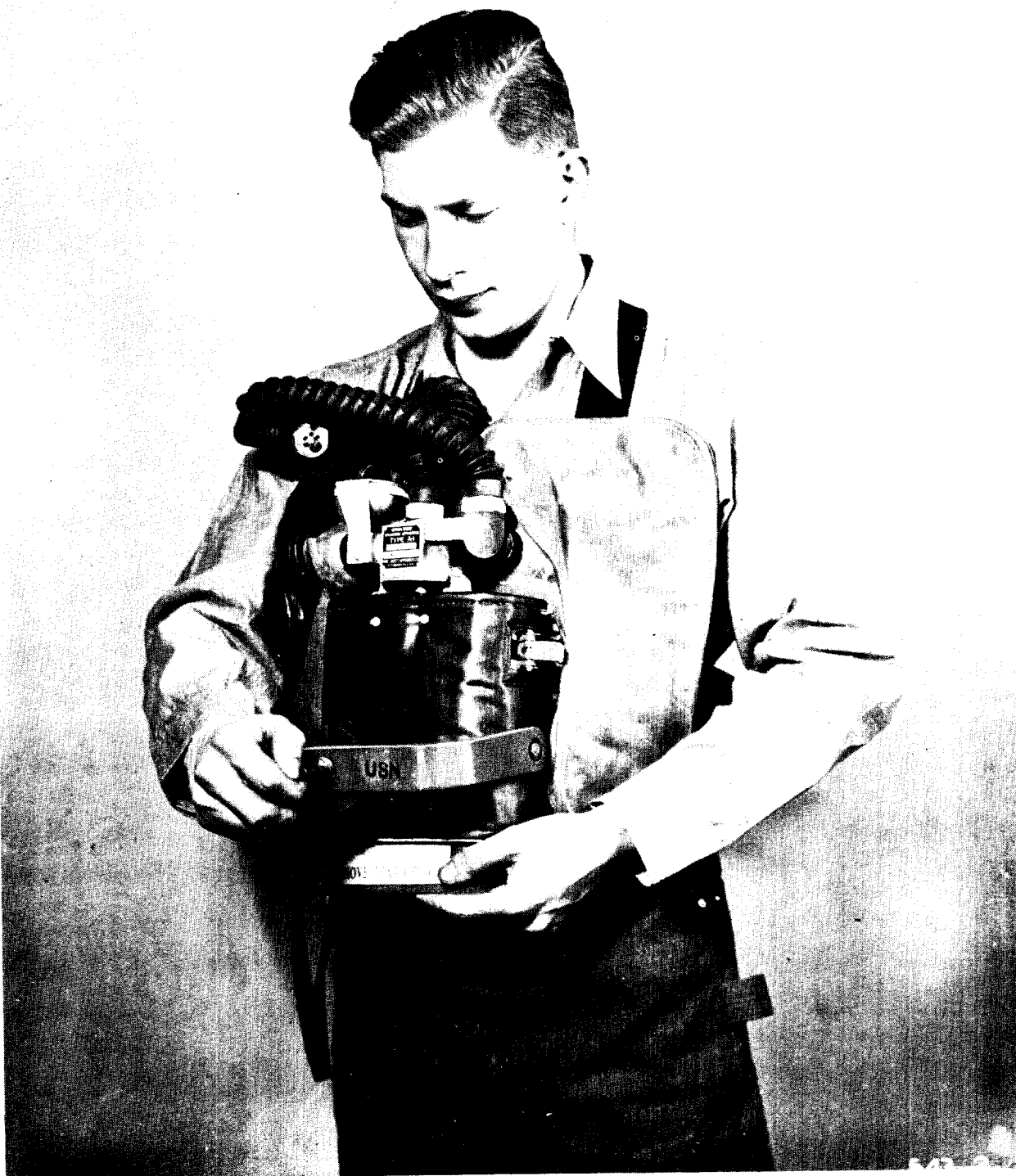


FIGURE 7

INSERTING CANISTER IN APPARATUS



FIGURE 8  
APPARATUS IN "STAND-BY" POSITION



FIGURE 9

PREPARING APPARATUS FOR "OPERATING" POSITION



FIGURE 10  
SLIPPING ON FACEPIECE





FIGURE 11  
INFLATING BREATHING BAG

breathing bag and start chemical action in canister. If after completing above procedure 15 times the bottom of the canister is not warm, repeat procedure approximately 15 times. If it is still not warm, obtain a new canister and repeat procedure. Some of the excess air can be released through starter valve. Excess time for filling bag and rapid deflation after filling to venting pressure is indicative of leakage. Do not use apparatus, but make complete check for leaks.

CAUTION: ALWAYS INFLATE BAG BY ABOVE PROCEDURE BEFORE USING THE APPARATUS SINCE SUCH PROCEDURE IS ABSOLUTELY NECESSARY TO START ACTION OF THE CHEMICAL. START OF CHEMICAL ACTION WILL BE INDICATED BY CANISTER BECOMING WARM.

11-Immediately upon inflating bag, turn pointer on timer dial clockwise to number 30. As apparatus is used, pointer will return to zero at which point bell will sound. If there has been no noticeable increase in resistance to breathing, reset pointer for an additional 15 minutes' work.

12-Upon sounding of timer bell, indicating canister has been in use 30 or 45 minutes, or when it becomes an effort to exhale and test indicates that resistance is not due to overinflation of breathing bags, immediately return to fresh air. Remember the approximate life of a canister in continuous use is 45 minutes.

13-To remove canister, spread legs apart, lean upper part of body slightly forward, turn handwheel counterclockwise to extreme "DOWN" position,

depress canister stop, and with a quick forward motion swing the bail outward. The canister will then drop out of the apparatus.

(See FIGURE 12). Before entering irrespirable atmosphere again, inflate breathing bag as described in (10).

CAUTION: USED CANISTER IS VERY HOT. DO NOT HANDLE WITHOUT SUITABLE PROTECTION FOR HANDS.

CAUTION: DO NOT ALLOW ANY LIQUID, ESPECIALLY OIL, GREASE OR GASOLINE, ETC., TO ENTER OPENING OF USED CANISTER AND DO NOT HOLD FACE OVER CANISTER OPENING. SHOULD THE CANISTER BE OPENED DO NOT HANDLE CHEMICAL WITHOUT SUITABLE CARE AND PROTECTION TO HANDS AND BODY, AS CHEMICAL IS CAUSTIC AND IS INJURIOUS TO THE SKIN, AND SHOULD NOT BE PERMITTED TO COME IN CONTACT WITH THE PERSON. DO NOT ALLOW UNEXPENDED OR EXPENDED CHEMICALS TO SPILL ON DECK. IF ACCIDENTALLY SPILLED, CLEAN UP IMMEDIATELY AND DUMP OVERBOARD USING A METAL OR NON-INFLAMMABLE MATERIAL FOR SCOOP. THIS CHEMICAL, DUE TO THE LARGE PERCENTAGE OF OXYGEN IT CONTAINS, WILL CAUSE COMBUSTION OF ANY INFLAMMABLE MATERIALS WITH WHICH IT IS BROUGHT INTO DIRECT CONTACT ESPECIALLY IF SUCH MATERIALS ARE MOIST. EXPENDED CANISTERS SHOULD BE DUMPED OVERBOARD.

OIL, GASOLINE OR SIMILAR MATERIALS COMING IN CONTACT WITH THE CHEMICAL IN EITHER THE UNEXPENDED OR THE EXPENDED CANISTERS WILL CAUSE AN EXPLOSION.

CANISTERS SHOULD NOT BE DUMPED OVERBOARD WHERE THERE IS AN OIL SLICK PRESENT ON THE WATER. DISPOSAL OVERBOARD SHOULD BE DEFERRED UNTIL THE VESSEL IS UNDERWAY. DO NOT THROW SPENT CANISTERS IN BILGES OR ANY SPACE WHICH MAY CONTAIN OIL OR OIL AND WATER.



FIGURE 12  
REMOVING USED CANISTER



FIGURE 13

TESTING APPARATUS FOR TIGHTNESS

## ASSEMBLY, MAINTENANCE AND CARE

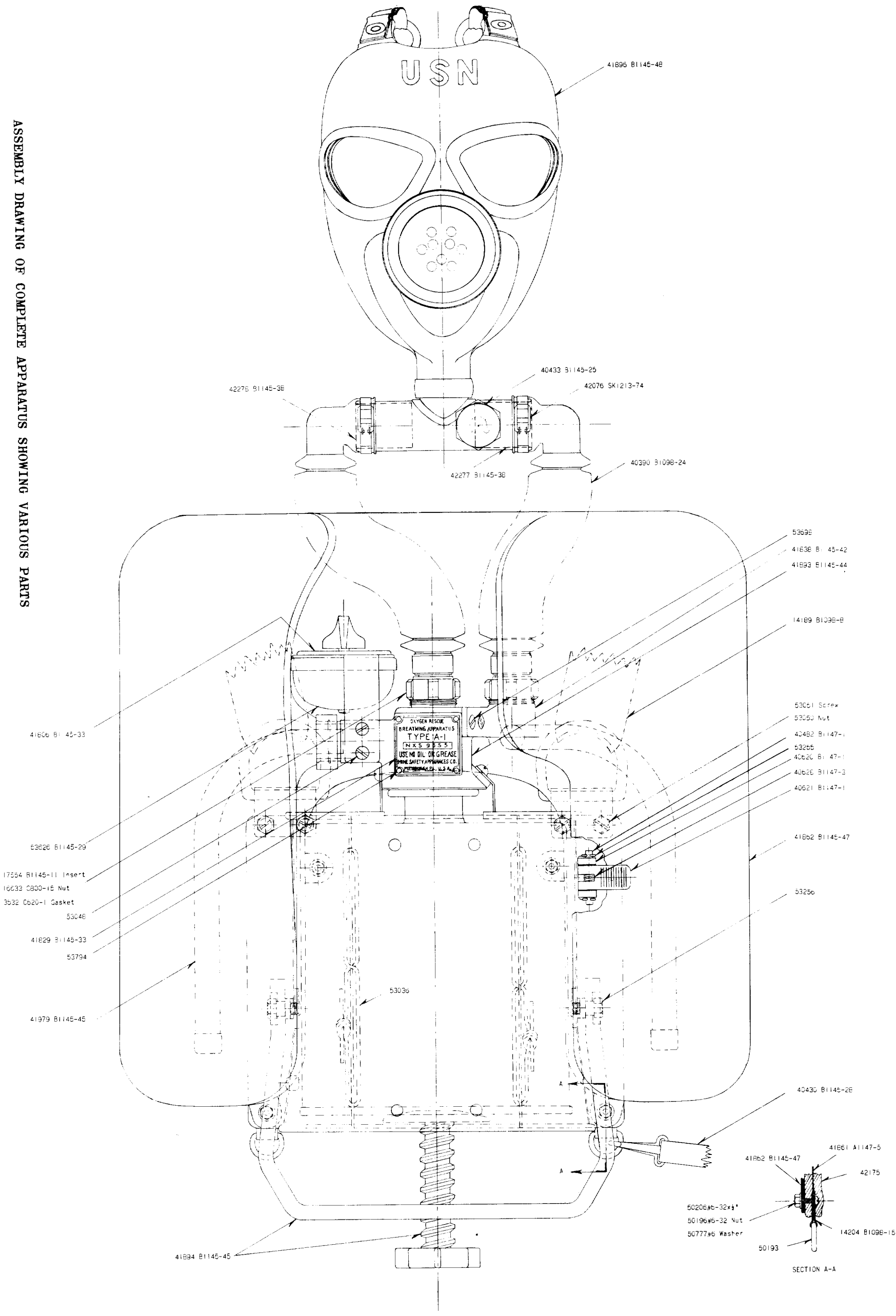
Assembly facepiece and breathing tubes to apparatus by attaching fluted coupling nuts at ends of breathing tubes to housing, tightening with spanner wrench. After the apparatus has been used, the following maintenance and care procedure is essential.

- 1-Remove canister and clean apparatus. Do not use any oil, gasoline or grease in such cleaning. Do not place apparatus in storage with canister inserted.
- 2-Facepiece can be separated from apparatus for cleaning and sterilizing by detaching coupling nuts. Considering the sanitary and technical aspects, it is desirable that this is done after every period of use of the apparatus. On apparatus with removable Facepiece valves, disconnect the toggle clamps holding the breathing tubes, remove tubes and valves. Clean, sterilize, and dry valves separate from Facepiece. After sterilizing Facepiece, hang up and allow to drain and dry completely. Cloth used to sterilize facepiece should be damp NOT sopping wet. Facepiece valves and Breathing tubes should then be assembled. Facepiece valves are stamped "IN" for inhalation and "EX" for exhalation, and should be inserted into their respective openings, in the metal mouthpiece, which are correspondingly marked "IN" and "EX" to assure proper function and breathing condition.  
Care must be exercised in assembling the facepiece valves into the metal mouthpiece so that the intended sections on the metal mouthpiece surface fit into the proper corresponding slots of the facepiece valves.
- 3-Examine carefully the speaking diaphragm discs for their general condition and freedom from holes after use if the apparatus has been in contact with flames or subjected to extreme heat. These discs will not support combustion but will burn slowly when in contact with fire or equivalent intense heat. Any damage resulting in the puncturing of the discs destroys the gas tight integrity of the apparatus.

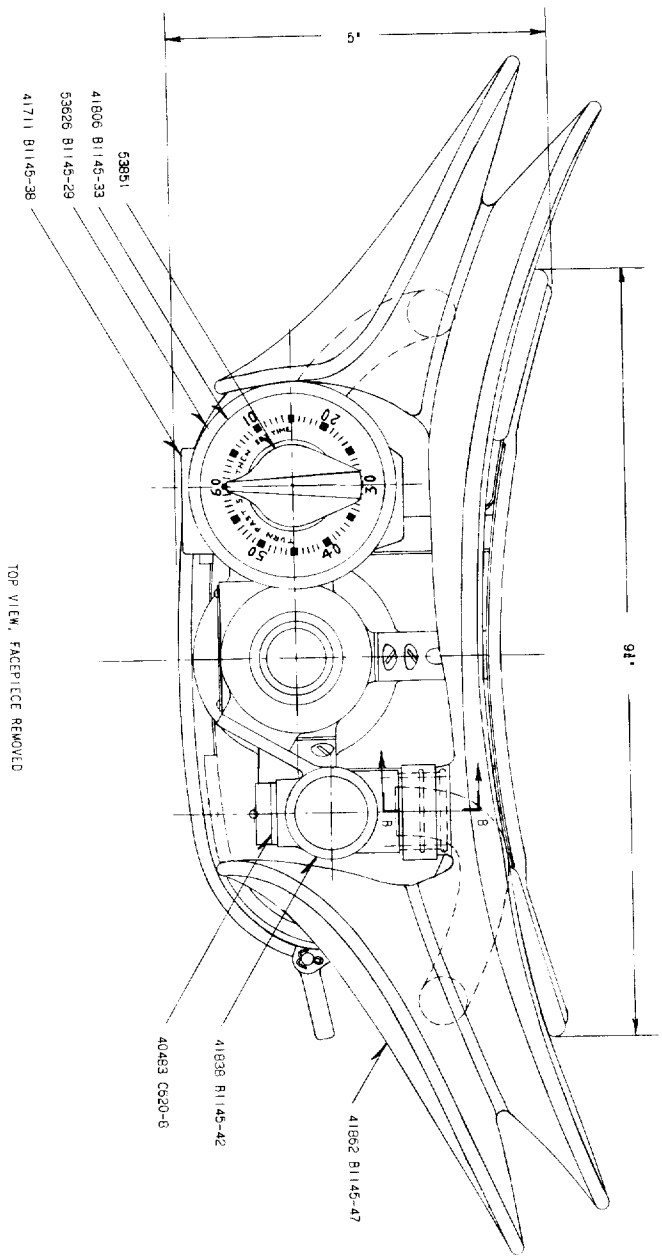
Defective discs should accordingly be replaced before the apparatus is again used.

- 4-While the apparatus is not in use there should be periodic inspection in order to keep the apparatus ready for use. An important point of inspection is to see that the main casting and plunger are clean and that the plunger operates freely. Never use oil, grease or vaseline on any part of the apparatus.
- 5-Stow in a cool, dry space. As far as practicable, canisters should be stored horizontally.
- 6-Extreme care must be taken to prevent any substance, including water or other liquids, from entering the breathing bag. This is especially true of oil, gasoline, kerosene, etc.
- 7-It is recommended that the breathing bag be tested for leaks periodically. A pressure of 9 inches of water by manometer should not be exceeded for this purpose.
- 8-(a) Rest apparatus on suitable bench or level, waist high section.  
(b) Put on facepiece and inflate the breathing bag as described previously.  
(c) With breathing bag fully inflated, grasp both breathing tubes tightly and twist them together so that no leakage can occur due to tubes not being closed off.  
(d) Watch breathing bag and if it deflates, check for point of leakage with soap solution and make necessary repairs to insure tightness, then retest for tightness prior to use.  
(e) There should be no leakage when apparatus is to be used; therefore, the apparatus must be maintained in a leak-tight condition by periodic checks.

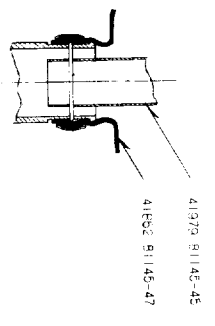
ASSEMBLY DRAWING OF COMPLETE APPARATUS SHOWING VARIOUS PARTS



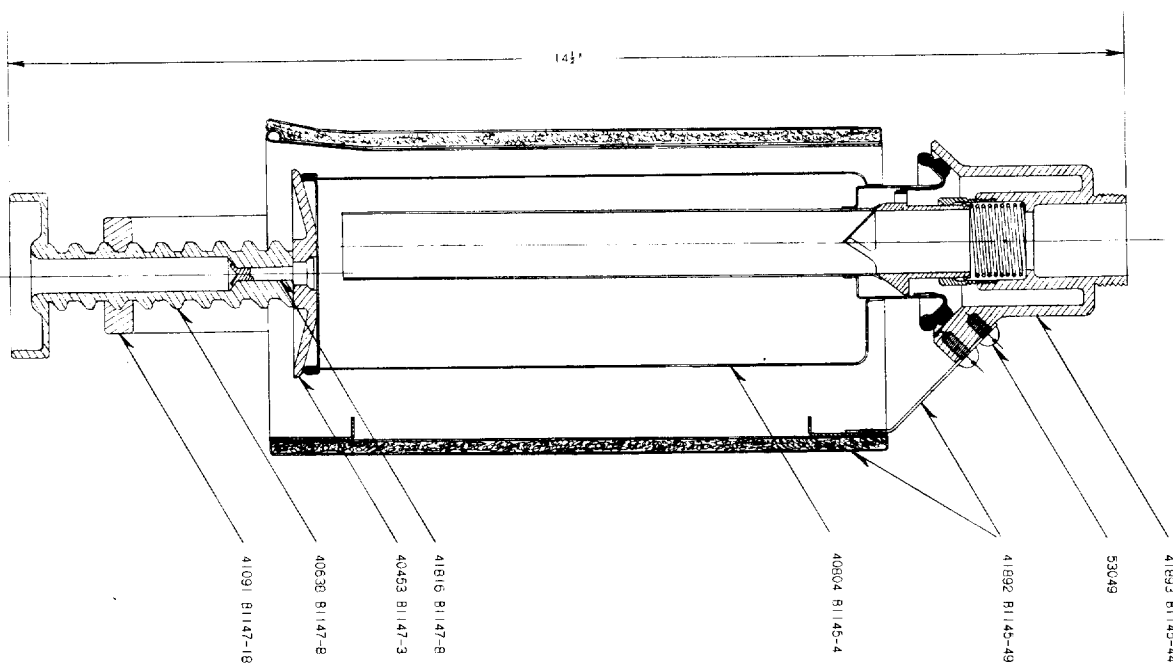




TOP VIEW, FACEPIECE REMOVED



SECTION B-B THRU  
BAG CONNECTION



ASSEMBLY DRAWING OF COMPLETE APPARATUS SHOWING VARIOUS PARTS

# PARTS LIST FOR NAVY OXYGEN RESCUE

## BREATHING APPARATUS-TYPE "A-1"

Part Number	Description
3532	Breathing Tube Coupling Rubber Gasket
8376	Starter Valve Rubber Gasket
14189	Harness (complete)
16506	Anti-Fogging Kit
16530	Diaphragm
16531	Speaking Diaphragm Gasket
16532	Speaking Diaphragm Spacer
16533	Rubber Mouthpiece
16633	Breathing Tube Coupling Nut
16726	Spanner Wrench for Breathing Tube Couplings
17488	Speaking Diaphragm Guard
17489	Speaking Diaphragm Retainer
17548	Starter Valve Spring
17554	Breathing Tube Coupling Insert
40390	Breathing Tubes (Separate)
40430	Waiste Strap (Complete)
40433	Starter Valve Housing And Stem (Complete)
40434	Speaking Diaphragm Type Facepiece Less
	Head Harness and Breathing Tubes
40441	Speaking Diaphragm (Complete)
40453	Pressure Plate
40482	Canister Stop Lever Pin
40620	Canister Stop Base

Part Number	Description
40621	Canister Stop Lever
40628	Canister Stop Lever Spring
40638	Spindle
53049	Plunger Housing Mounting Screw
53255	Canister Stop Cotterpin
53256	1/4" Stainless Steel Nut
41862	Breathing Bag
41892	Guard & Breast Plate, Complete
41893	Housing & Plunger Assembly, Complete
41838	Inhalation Elbow
41894	Bail, Complete
41896	Facepiece, Complete
41806	Timer Dial
41711	Timer Bracket
41979	Woven Wire Tube
53048	Screw For Timer Bracket #10-24 x 1/4"
53698	Screw For Inhalation Elbow #10-24 x 3/8"
40804	Canister
53051	Screw for Harness #10-32 x 5/16"
53050	Nut for Harness #10-32
41091	Bail
41816	Pressure Plate Insert
41897	Headharness, Complete
53851	Timer Knob
42276	Timer, Complete With Bracket

## Part Number

## Description

42157

Facepiece Valve, Complete With Removable Valves

42076

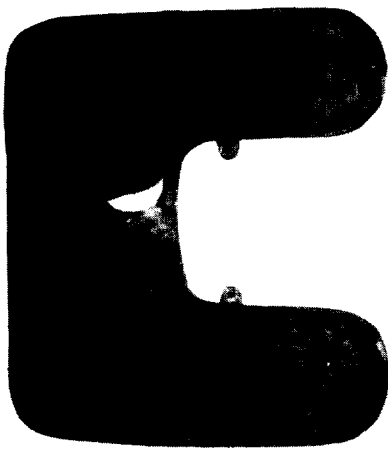
Breathing Tube Clamp

42277

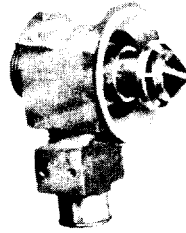
Removable Inhalation Valve, Complete

42278

Removable Exhalation Valve, Complete



41862



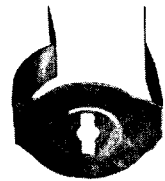
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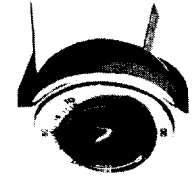
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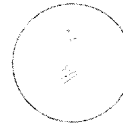
8376



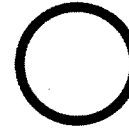
41711



42276



16530



17489



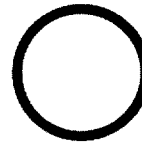
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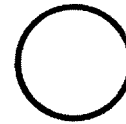
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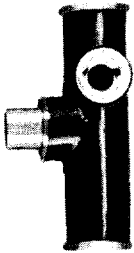
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16531



41806



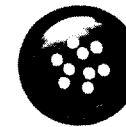
42157



16533



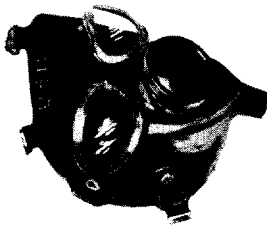
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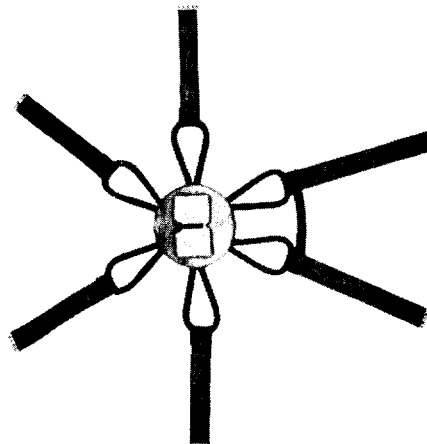
17488



53851



40434



41897



17548



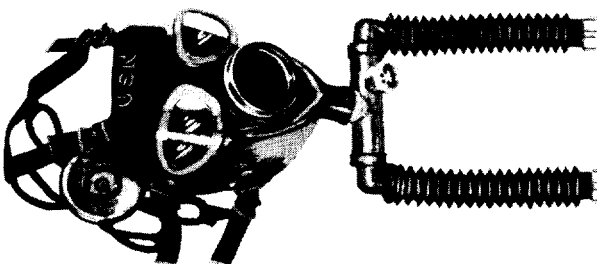
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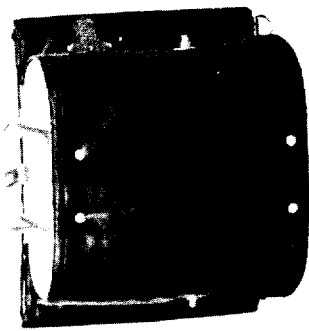


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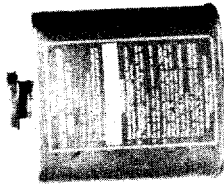


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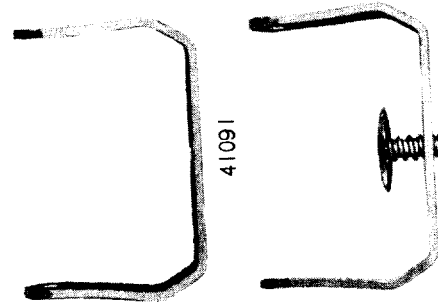
PICTURES OF VARIOUS PARTS WITH PART NUMBERS



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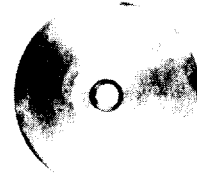
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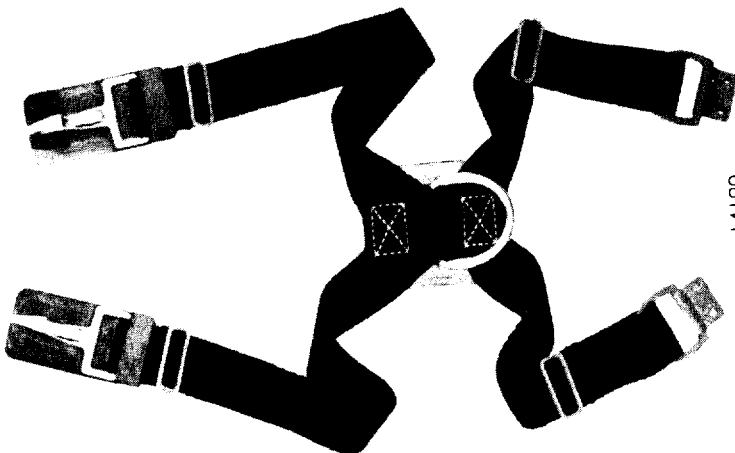
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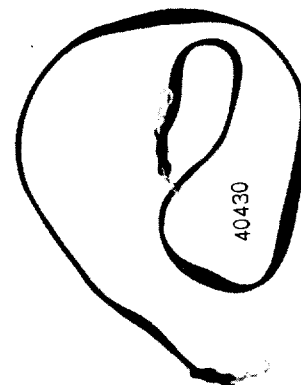
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PICTURES OF VARIOUS PARTS WITH PART NUMBERS

## SUMMARIZED OPERATING INSTRUCTIONS

1. Before Donning Apparatus, Unfasten And Straighten All Harness Straps.

2. Grasp Apparatus With One Hand By Central Casting Dropping Facepiece Over Hand Holding Apparatus, With Other Hand Grasp D-Ring Assembly With Breathing Tubes Hanging Forward. Put Breast Plate On Chest And Head Through V-Shaped Opening Formed By The Crossing Of Two Straps Attached To Breast Plate.



3. Hold Apparatus On Chest With One Hand And With Other Reach Around To Rear At One Side Grasping Free End Of Harness Strap Passing Over The Shoulder Of Opposite Side. Bring End Of Strap Beneath Armpit And

Snap Into Metal D-Ring On Top Side Of Breast Plate. This Is Same D-Ring To Which Is Attached Other End Of Opposite Strap. Repeat Procedure For Other Strap.

4. Adjust Position Of Apparatus On Body By Metal Slides Located On Harness Straps. Position Of Apparatus On Body Should Be Such That When Facepiece Is Placed On Face Breathing Tubes Will Permit Greatest Freedom Of Movement Of Head.

5. Attach Waist Strap To Small D-Ring On Each Lower Side Corners Of Breast Plate And Adjust To Hold Apparatus Snugly To Body.

6. To Place Canister In Apparatus, Remove Metal Protective Cap And Expose The Metallic Foil Seal In Neck By Pulling Metal Tab Straight Out And Then Straight Back Across Top Of Cap Pulling Off Cap. With Handwheel In Extreme "DOWN" Position, Swing Bail Outward And Insert Canister In Guard Against Canister Stop. Place Bail Under Canister And Lock Canister In Place By Turning Handwheel Clockwise. Apparatus Is Now Ready for "STAND-BY" Service. Before Inserting Canister Make Sure The Protective Tear-Off Cap Has Been Removed.

7. "OPERATING" Position Is Obtained By Releasing Handwheel One Half Turn, Pushing

In Canister Stop And Turning Handwheel Up Until Tight Contact Of The Canister Gasket Against The Plunger Housing Has Been Made.



8. Slip On Facepiece And Adjust Head Straps To Fit Face And Head Size Of Individual.



9. To Obtain Firm And Comfortable Fit Against Face At All Points Adjust Headbands As Follows:

- (a) See That Straps Lie Flat Against Head.
- (b) Tighten Lower Or "Neck" Straps.
- (c) Tighten "Side" Straps. (Don't Touch "Front" Straps).
- (d) Place Both Hands On Headband And Push Toward Neck.



- (e) Repeat Operations (b) and (c).
  - (f) Tighten Forehead Or "Front" Straps.
  - (g) Test For Tightness Of Facepiece By Pinching Breathing Tubes And Inhaling Slowly.
10. With Facepiece In Position Depress Starter Valve And Inhale Then Release Starter Valve And Exhale Into Apparatus. Repeat This Procedure For Fifteen (15) Complete Respirations In Order To Inflate Breathing Bag. Greater Ease In Inflating Breathing Bag Is Afforded By Pinching Breathing Tubes With One Hand While Inflating Bag Via Starter Valve.
  11. Immediately Upon Inflating Bag Turn Pointer On Timer Dial Clockwise To Number 30. As Apparatus Is Used Pointer Will Return To Zero At Which Point Bell Will Sound.
  12. Upon Sounding Of Timer Bell, Indicating Canister Has Been In Use 30 or 45 minutes, Or When It Becomes An Effort To Exhale And Test Indicates That Resistance Is Not Due To Overinflation Of Breathing Bags, Immediately Return To Fresh Air. Remember The approximate Life Of A Canister In Continuous Use Is 45 Minutes.
  13. To Remove Canister Lean Slightly Forward, Turn Handwheel To Extreme "DOWN" Position And With Quick Motion Swing Bail Outward. DO NOT TOUCH EXHAUSTED CANISTER WITHOUT PROTECTION TO HANDS! EXHAUSTED CANISTER IS VERY HOT!



CAUTION: DO NOT ALLOW ANY LIQUID, ESPECIALLY OIL, GREASE OR GASOLINE, ETC., TO ENTER OPENING OF USED CANISTER AND DO NOT HOLD FACE OVER CANISTER OPENING. SHOULD THE CANISTER BE OPENED DO NOT HANDLE CHEMICAL WITHOUT SUITABLE CARE AND PROTECTION TO HANDS AND BODY, AS CHEMICAL IS CAUSTIC AND IS INJURIOUS TO THE SKIN, AND SHOULD NOT BE PERMITTED TO COME IN CONTACT WITH THE PERSON. DO NOT ALLOW UNEXPENDED OR EXPENDED CHEMICALS TO SPILL ON DECK. IF ACCIDENTALLY SPILLED, CLEAN UP IMMEDIATELY AND DUMP OVERBOARD USING A METAL OR NON-INFLAMMABLE MATERIAL FOR SCOOP. THIS CHEMICAL, DUE TO THE LARGE PERCENTAGE OF OXYGEN IT CONTAINS, WILL CAUSE COMBUSTION OF ANY INFLAMMABLE MATERIALS WITH WHICH IT IS BROUGHT INTO DIRECT CONTACT ESPECIALLY IF SUCH MATERIALS ARE MOIST. EXPENDED CANISTERS SHOULD BE DUMPED OVERBOARD.

OIL, GASOLINE OR SIMILAR MATERIALS COMING IN CONTACT WITH THE CHEMICAL IN EITHER THE UNEXPENDED OR THE EXPENDED CANISTERS WILL CAUSE AN EXPLOSION.

CANISTERS SHOULD NOT BE DUMPED OVERBOARD WHERE THERE IS AN OIL SLICK PRESENT ON THE WATER. DISPOSAL OVERBOARD SHOULD BE DEFERRED UNTIL THE VESSEL IS UNDERWAY. DO NOT THROW SPENT CANISTERS IN BILGES OR ANY SPACE WHICH MAY CONTAIN OIL OR OIL AND WATER.