

TECHNICAL MANUAL }
 No. 9-1799 }

WAR DEPARTMENT
 Washington, April 23, 1943

ORDNANCE MAINTENANCE: FIRE EXTINGUISHERS

Prepared under the direction of the
 Chief of Ordnance

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ORDNANCE MAINTENANCE: FIRE EXTINGUISHERS

Section I

INTRODUCTION

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1. SCOPE.

a. The instructions contained in this manual are for the information and guidance of personnel charged with the maintenance and repair of fire extinguishers.

b. This manual contains illustrations and description of, procedure for the operation, maintenance, charging, disassembly, inspection and repair, and assembly of the following fire extinguishers:

C-O-TWO FIRE EXTINGUISHERS

Ordnance No.	Style	Size	Type	Manufacturer's No.
B183325	Fixed	10-lb	CO ₂ (Carbon dioxide)	AP-4
D37127	Portable	4-lb	CO ₂ (Carbon dioxide)	Type PS-4

KIDDE-LUX FIRE EXTINGUISHERS

B183325	Fixed	10-lb	CO ₂ (Carbon dioxide)	79120
D38702	Fixed	7½-lb	CO ₂ (Carbon dioxide)	23860
D37127	Portable	4-lb	CO ₂ (Carbon dioxide)	79143

FIRE GUARD FIRE EXTINGUISHER

A229521	Portable	1-qt	CCl ₄ (Carbon tetrachloride)	Model 85 HD
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O-FIRE-GUN FIRE EXTINGUISHER

C74060	Portable	1-qt	CCl ₄ (Carbon tetrachloride)	13 x 1193
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INTRODUCTION

2. CHARACTERISTICS.

a. **General.** These fire extinguishers are of two types, those which use carbon dioxide as an agent for fighting fire and those which use CARBON TETRACHLORIDE.

b. **Carbon Dioxide Fire Extinguishers.** The carbon dioxide fire extinguishers are of the 4-pound, 7½-pound, and 10-pound size manufactured by C-O-Two Fire Equipment Company and Walter Kidde Company. These weights are the weight of carbon dioxide in the cylinder when fully charged. The 7½-pound and 10-pound extinguishers are equipped with the same type valve and can be connected to a fixed fire extinguisher system or a discharge hose and horn, and used as a portable job. The 4-pound extinguisher is a portable job only. The carbon dioxide extinguishers are used in class B and C fires.

c. **Carbon Tetrachloride Fire Extinguishers.** The carbon tetrachloride fire extinguishers are the Fire Guard and the O-Fire-Gun. These are of the 1-quart vaporizing liquid type for hand pumping operation and are used for Class B and C fires. The following is a list of fire classifications:

(1) **CLASS A FIRES.** Fires in ordinary combustible material where the quenching and cooling effects of quantities of water, or solutions containing large percentages of water are of first importance.

(2) **CLASS B FIRES.** Fires in flammable liquids, greases, etc., where a blanketing effect is essential.

(3) **CLASS C FIRES.** Fires in electrical equipment where the use of a nonconducting extinguishing agent is of first importance.

3. ALLOCATION OF MAINTENANCE DUTIES BY ECHELONS.

a. Echelons and words as used in this list of maintenance allocation are defined as follows:

SECOND ECHELON: Line organization regiments, battalions, companies (first and second echelons).

THIRD ECHELON: Ordnance light maintenance companies, ordnance medium maintenance companies, ordnance divisional maintenance battalions, and post ordnance shops.

FOURTH ECHELON: Ordnance heavy maintenance companies, and service command shops.

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- FIFTH ECHELON:** Ordnance base regiments, ordnance bases, arsenals, and manufacturers' plants.
- SERVICE:** (Including preventive maintenance) (par. 23 a (1) and (2), AR 850-15 (10-6-42)) Consists of servicing, cleaning, lubricating, tightening bolts and nuts, and making external adjustments of subassemblies or assemblies and control.
- REPLACE:** (par. 23 a (4) AR 850-15 (10-6-42)) Consists of removing the part, subassembly or assembly from the vehicles and replacing it with a new or reconditioned or rebuilt part, subassembly or assembly, whichever the case may be.
- REPAIR:** (par. 23 a (3) and (5), in part, AR 850-15 (10-6-42)) Consists of making repairs to, or replacement of the part, subassembly or assembly that can be accomplished without completely disassembling the subassembly or assemblies, and does not require heavy welding, or riveting, machining, fitting and/or balancing.
- REBUILD:** (par. 23 a (5), in part, and (6), AR 850-15 (10-6-42)) Consists of completely reconditioning and replacing in serviceable condition any unserviceable part, subassembly, or assembly of the vehicle, including welding, riveting, machining, fitting, alining, balancing, assembling, and testing.

b. Maintenance Allocations.

NOTE: Operations allocated will normally be performed in the echelon indicated by "X". Operations allocated to the echelons as indicated by "E" may be accomplished by the respective echelons in emergencies only.

FIRE EXTINGUISHING SYSTEMS	ECHELONS			
	2nd	3rd	4th	5th
Controls, remote — replace	X			
Controls, remote — repair		X		
Cylinder, CO ₂ — replace	X			
Cylinder, CO ₂ — repair and recharge		X		
Extinguisher assemblies, fire, CO ₂ — repair and recharge....		X		
Extinguisher assemblies, fire, CO ₂ — rebuild			E	X
Extinguisher assemblies, fire, CCl ₄ — replace and refill.....	X			
Extinguisher assemblies, fire, CCl ₄ — repair		X		
Lines and nozzles — replace	X			
Lines and nozzles — repair		X		

Section II

C-O-TWO FIRE EXTINGUISHERS (CO₂)

	Paragraph
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Storage and shipment	9
AP-4 valve, 10-pound unit	10
Control head, 10-pound unit	11
PS-4 squeeze grip valve, 4-pound unit	12
Siphon tube	13

4. DESCRIPTION.

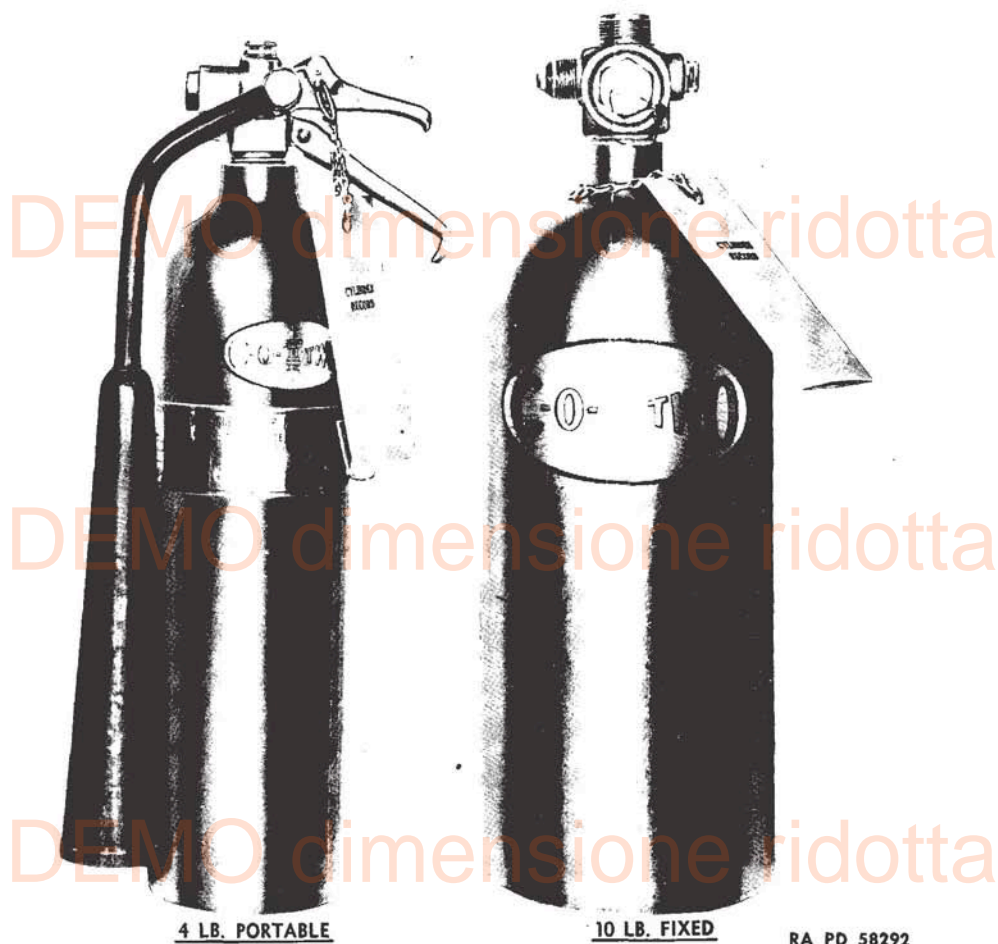
a. These fire extinguishers, as manufactured by the C-O-Two Fire Extinguisher Company, are as follows:

Ordnance No.	Type	Size	Manufacturer's Identification
D37127	Portable	4-lb	Type PS-4
B183325	Fixed	10-lb	Type AP-4

b. **Portable Unit, 4-Pound** (fig. 1). This extinguisher is a portable unit charged with 4 pounds (by weight) of carbon dioxide and equipped with a handle for carrying it to the scene of the fire. The cylinder is made of high quality steel, tested to withstand a hydrostatic pressure of 3,360 pounds, and has a flat bottom to permit the cylinder to stand in an upright position. Part of later production is manufactured with round bottoms. It is equipped with a squeeze grip valve which retains the gas and controls the discharge when the trigger is squeezed. It has a discharge horn fastened to the valve for directing the discharge on the fire.

c. **Fixed Unit, 10-Pound** (fig. 1). This extinguisher is a fixed unit connected to a distributing system and is charged with 10 pounds (by weight) of carbon dioxide. The cylinder is made of high quality steel to withstand a hydrostatic pressure of 3,360 pounds. This cylinder is equipped with the AP-4 valve (fig. 9) securely screwed into the cylinder, and is provided with a siphon tube having a universal coupling and extending to the bottom of the cylinder. This permits the cylinder to be in-

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4 LB. PORTABLE

10 LB. FIXED

RA PD 58292

Figure 1 — C-O-Two Fire Extinguishers

stalled in either a vertical or horizontal position. The cylinder valve consists essentially of a primary check and a secondary check. The checks retain the gas in the cylinder, both being subjected directly to the gas pressure in the cylinder. Thus, they are always firmly pressure-seated whenever gas is in the cylinder and before the primary check is tripped. The primary check, at the top of the valve, is opened by means of a pin actuated by a cam in the control head (control head is part of vehicle equipment and is not removed when extinguishers are changed). The gas discharged through the primary check is admitted through a drilled passage to the space above the piston of the secondary check. The pressure on this piston opens the secondary check, allowing the gas to discharge through the valve

C-O-TWO FIRE EXTINGUISHERS (CO₂)

outlet. Once the primary check is opened by the control head pin the entire content of the cylinder will be discharged.

d. **Control Head** (fig. 10). The control head is not a part of the extinguisher, but is a part of the distributing and control system used with the cylinders equipped with an AP-4 valve. The head is mounted on the valve by means of a swivel nut. The pin for operating the primary check in the cylinder valve, is actuated by the cam in the center of the control head. The cam may be rotated by either the manual release lever or by the cable sheave, each operating independently of the other.

5. OPERATION.

a. **Portable Unit, 4-Pound** (fig. 2). Remove extinguisher from hanger bracket. Carry extinguisher to scene of fire by the carrying handle. Pull locking pin from trigger, breaking sealing wire. Cylinder must remain in an upright position. Squeeze trigger and handle together and direct the discharge by raising or lowering the discharge horn. Direct the discharge at the base of the flame and work upward. When fighting floor fires, extinguish the portion nearest you first; then advance the discharge as the flame is extinguished. Do not haphazardly direct discharge over various sections of the fire. Put out one portion of the fire completely before attacking other parts. Continue the discharge after the flames are out, so as to coat the hot material with carbon dioxide snow. The time required for the discharge of C-O-Two portable cylinders is as follows:

Size	Time in Seconds
2-lb	13
4-lb	18
7 1/2-lb	15
10-lb	28
10-lb (equipped with Kidde-Lux or AP-4 Valve)	3
15-lb	24
20-lb	25

NOTE: Replace used extinguisher with a fully charged one at once. Have used extinguisher shipped to charging station.

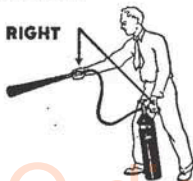
b. **Fixed Unit, 10-Pound.** The fixed unit is connected to the fire extinguishing system through a control head and tubing. To operate pull release handle marked "FIRE PULL," located either on the inside or outside of vehicle, or in both places. The cylinder may also be discharged by removing the locking pin in the control head and rotating the small lever marked "PULL" on one side and "PUSH" on the other. The locking pin need not be removed in order to release the gas with the cable pull. Once

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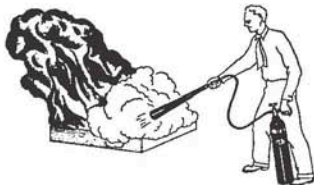
The RIGHT Way

1 Carry extinguisher to fire **THEN OPEN VALVE.**

2 CARRY extinguisher with left hand. Hold nozzle at **HOSE END** of HANDLE with other hand.



3 Direct discharge **CLOSE** to fire.



4 Direct discharge **FIRST** at **EDGE NEAREST OPERATOR** or, if on vertical surface, at **BOTTOM OF FIRE.**



5 **SLOWLY AND DELIBERATELY ADVANCE** discharge as flame is extinguished. Be sure all flame is **OUT** in part of fire tackled before advancing.

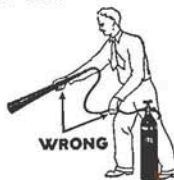
6 Continue discharge after flames are out so as to **COAT HOT MATERIAL WITH CARBON DIOXIDE SNOW.**

7 Have extinguisher **RECHARGED AS SOON AS POSSIBLE.**

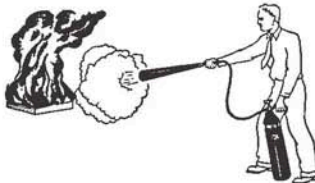
The WRONG Way

1 **DON'T OPEN VALVE BEFORE** carrying extinguisher to fire.

2 **DON'T** stand extinguisher on the ground. **DON'T** hold nozzle near discharge end.



3 **DON'T** direct discharge at fire **FROM FAR AWAY.**



4 **DON'T** direct discharge at center of fire and then attempt to work to the edge.



5 **DON'T HAPHAZARDLY** direct discharge over various sections of fire. Put out one portion of fire completely before attacking other parts.

6 **DON'T** shut off extinguisher **AS SOON AS** flame is put out.

7 **DON'T** put used extinguisher aside and **FORGET** about recharging.

RA PD 7062

Figure 2 — Correct Use Of Carbon Dioxide Fire Extinguisher

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the cable is pulled or the lever rotated, the entire content of the cylinder will be discharged.

6. EFFECT OF CARBON DIOXIDE ON PERSONNEL.

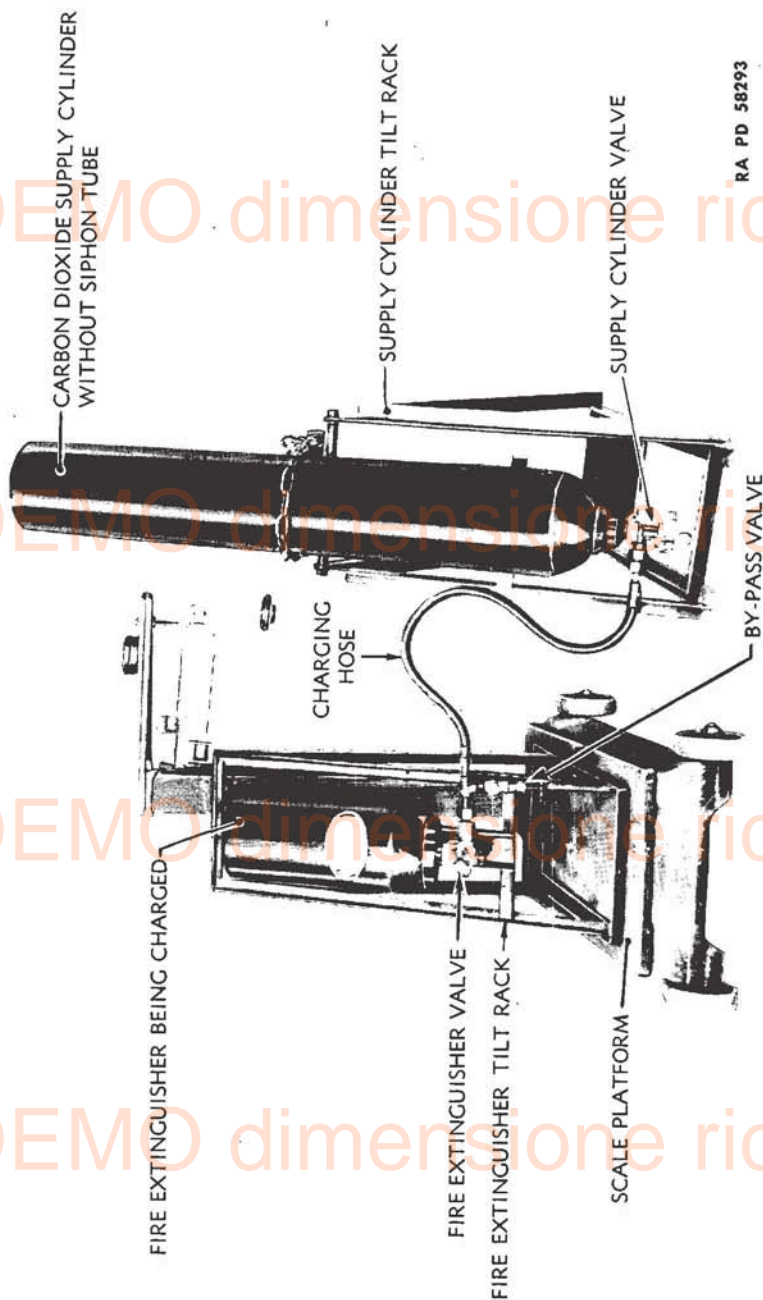
a. These fire extinguishers use carbon dioxide as an agent for fighting fires. Carbon dioxide (not to be confused with carbon monoxide) is not poisonous, but suffocating. It is normally colorless except that when discharging it resembles a cloud of steam. When inhaled it produces a tingle in the nostrils, the same as experienced when drinking soda water. It can be applied to the skin in the form of snow with no ill effect. If applied with a slight pressure to the skin in the form of dry ice, it will produce a painful blister. It is a nonconductor of electricity, it is noncorrosive and non-injurious to all substances, and although heavier than air, it can be easily diffused and removed by ventilation. Unlike air, it does not contain oxygen in any form available to support combustion or for sustaining human life in breathing. Since a person cannot breath but will suffocate in an atmosphere of carbon dioxide, caution must be taken before entering any space filled with this gas. Thoroughly ventilate the space into which the gas has been discharged to make certain that all portions contain fresh air. Should it be necessary for a person to enter a space before it is thoroughly ventilated, he may do so for a short period by holding his breath. Should a person be overcome by carbon dioxide, it is essential that he be rescued from the space containing the gas within 5 minutes. To revive a person so overcome, give him plenty of fresh air and apply artificial respiration, as in the case of drowning in water.

7. MAINTENANCE (PREVENTIVE).

a. Every 4 months the control head must be removed from the cylinder. Weigh the cylinder to determine the weight of carbon dioxide. Contents can be determined only by weight, do not use a pressure gage. The empty weight and full weight is stamped on the valve of each cylinder as it stands, without the control head, and other attachments, or the discharge horn on the portable cylinder. Weigh the cylinder with content. From this weight subtract the empty weight stamped on the valve. The net weight must be within 10 percent of the full weight (9 pounds for the 10-pound unit, 3.6 pounds for the 4-pound unit). Cylinders which do not meet these weights must be removed for recharging and a full cylinder installed. The portable extinguisher must be weighed in the same manner, and replaced if not up to weight.

b. While the control head is disconnected from the cylinder valve, test operation of the pull cable, and the pull lever on the control head, to make

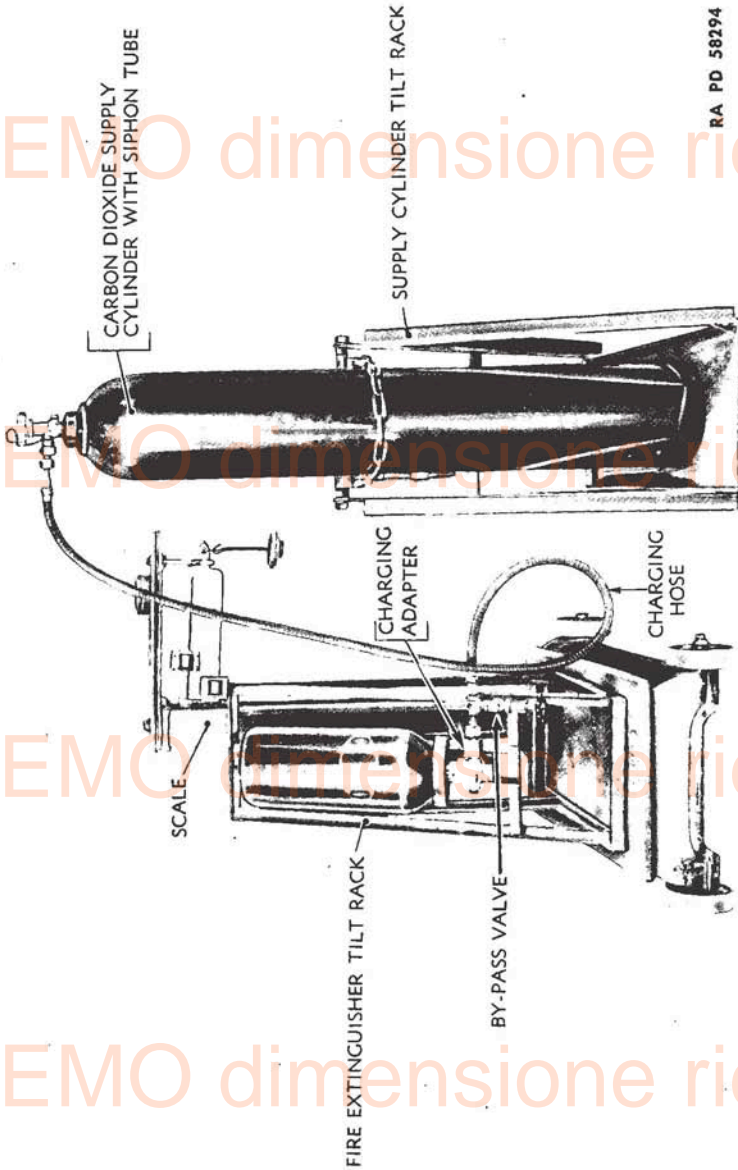
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RA PD 58293

Figure 3 — Charging CO₂ Fire Extinguisher By The Cooling Method
Using A Supply Cylinder Without A Siphon Tube

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RA PD 58294

Figure 4 — Charging CO₂ Fire Extinguisher By The Cooling Method Using A Supply Cylinder Equipped With A Siphon Tube

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sure the cam and plunger pin work freely. Connect control head to valve and install locking pin and seal wire.

c. After long rough trips or after combat, examine the cylinders in general for bad dents or breaks. Check condition of valve, control heads, clamps and, on the portable unit, the discharge horn. On fixed units the cylinder connections, tubing, nozzles and horns must be checked. Tighten all connections and replace any broken or damaged parts.

8. RECHARGING CYLINDERS.

a. General.

(1) These instructions are for the charging of cylinders by the cooling method (figs. 3 and 4). This method consists of first introducing a small charge of carbon dioxide into the extinguisher to be charged, then allowing this carbon dioxide to discharge into the atmosphere, thus cooling the cylinder. After this precooling, the full charge may be introduced by simple flow due to the equalization of pressure and temperature.

(2) The cooling method permits charging to be done with a minimum of parts and at a small initial expense. It is recommended that this method be used only on extinguishers of 20-pound capacity or smaller.

(3) In charging extinguishers of larger capacity than 20 pounds, or small extinguishers in large quantities, it is advisable to use a *transfer unit* (fig. 5). The speed and economy in the use of this unit will offset the initial outlay.

(4) Before charging any cylinder, check the date of last hydrostatic test. This date is stamped on the cylinder just below the neck. The month and year only, are shown; for example, 8-41 would mean August 1941. If 5 years have elapsed since the last test, the cylinder must be set aside for shipment to the nearest testing station. The hydrostatic test pressure on carbon dioxide cylinder is 3,360 pounds per square inch.

b. Procedure, Cylinders With AP-4 And PS-4 Valves.

(1) **EQUIPMENT.** Obtain a commercial cylinder of 50 pounds or greater capacity to be used as a supply. Carbon dioxide must be bone dry and the valve must have the largest outlet port available. Procure a platform scale that is accurate to within 2 ounces, a tilt rack to mount on the scale, a tilt rack for the supply cylinder, a bypass valve, and a charging hose with adapters (figs. 3 and 6). Due to high pressure of charging gas, only hose made for this purpose must be used. If the supply cylinder is equipped with a siphon tube the tilt rack is not necessary. However, the

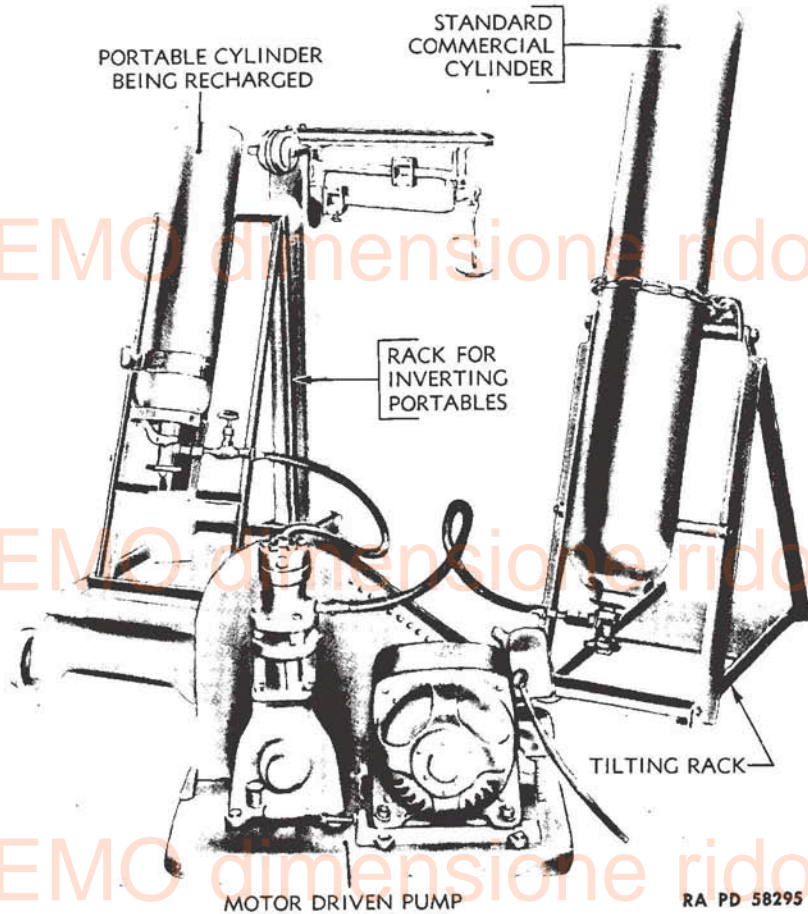
C-O-TWO FIRE EXTINGUISHERS (CO₂)

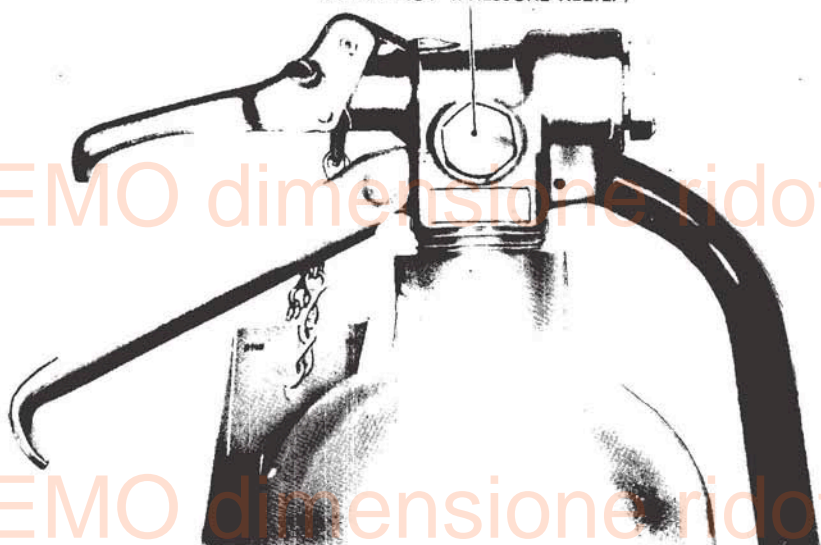
Figure 5 — Charging CO₂ Fire Extinguisher With A Transfer Unit

cylinder must be set upright and securely fastened to prevent falling over. If the scale tilt rack cannot be obtained, the extinguisher can be laid on the scale, and a 4-inch square block placed under the bottom end.

(2) **WEIGH CYLINDER TO DETERMINE HOW MUCH CARBON DIOXIDE IS IN THE CYLINDER.** Empty weight stamped on the valve of the portable extinguisher does not include the discharge horn. Empty weight stamped on the valve of the fixed extinguisher does not include the control head. These parts must be removed when weighing to determine how much carbon dioxide is in the cylinder. Subtract the empty weight from the scale reading and mark the remainder (the net weight of gas in the cylinder) in chalk on the cylinder. **NOTE:** If extinguisher is completely empty, make sure that the safety disk is intact. To replace blown safety disk, unscrew

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SAFETY NUT (PRESSURE RELIEF)



RA PD 58302

Figure 13 – Safety For PS-4 Valve (C-O-Two Fire Extinguisher)

12. PS-4 SQUEEZE GRIP VALVE, 4-POUND UNIT.

a. **Description** (figs. 12 and 13). The PS-4 squeeze grip valve is mounted on the portable fire extinguishers and controls the discharge of carbon dioxide gas. The body is a brass forging and contains a valve check with plunger which is opened by the squeezing of the trigger and is returned to the closed position by the gas pressure. A heavy spring mounted behind the check keeps the check closed when the cylinder is empty. A safety disk is mounted on the side of the valve, of early production; on valves of later production this safety is mounted on the top. This safety disk is calibrated to rupture and discharge the cylinder if internal pressure of cylinder exceeds 2,600 pounds. The valve is also equipped with a swivel joint, to which the discharge horn is connected.

b. **Disassembly** (figs. 12 and 13).

(1) **EQUIPMENT.**

HACKSAW

HAMMER

PLIERS

PUNCH, pin

PUNCH, rivet, $\frac{3}{8}$ -in.

SCREWDRIVER

WHEEL, emery

WRENCH, box, $\frac{1}{8}$ -in.

WRENCH, box, $\frac{7}{8}$ -in.

WRENCH, box, 1-in.

WRENCH, pipe, 6-in.

WRENCH, special, diffusion
button

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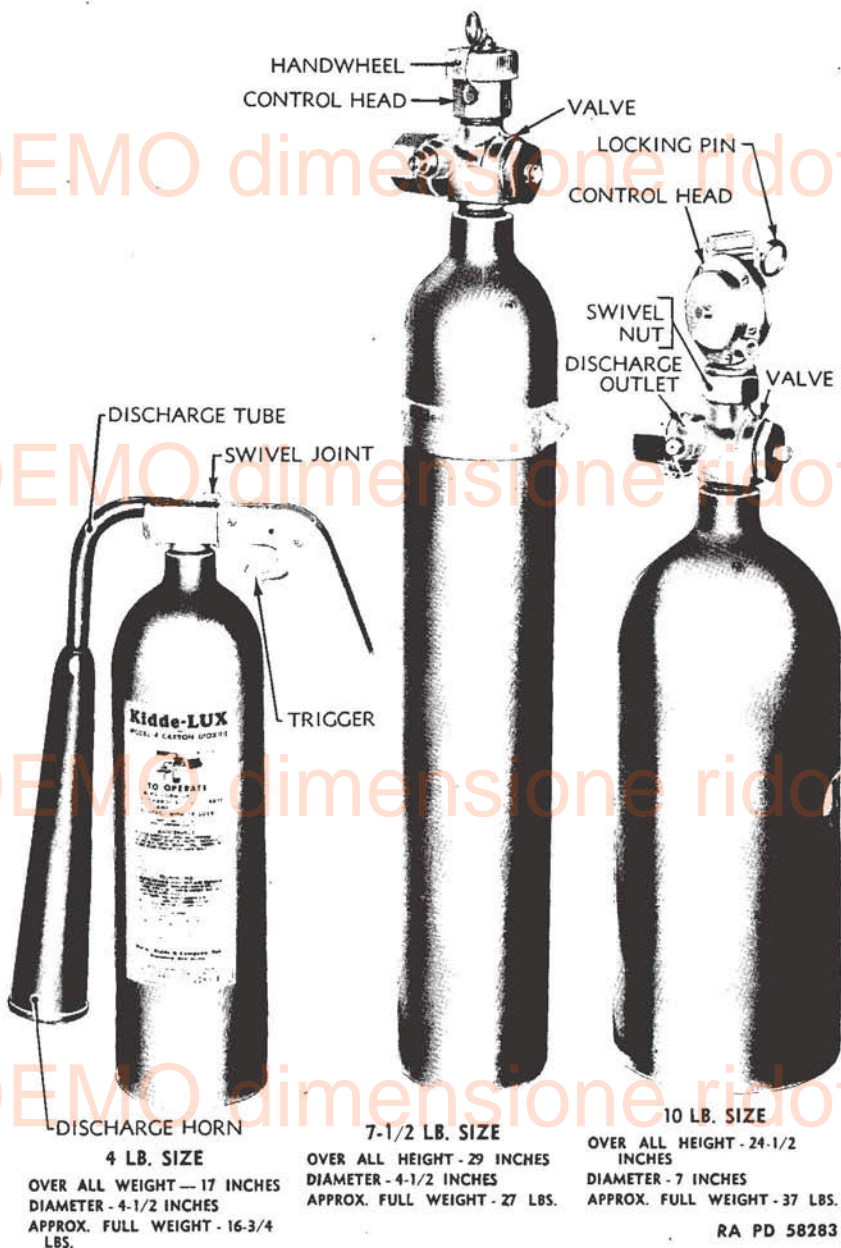
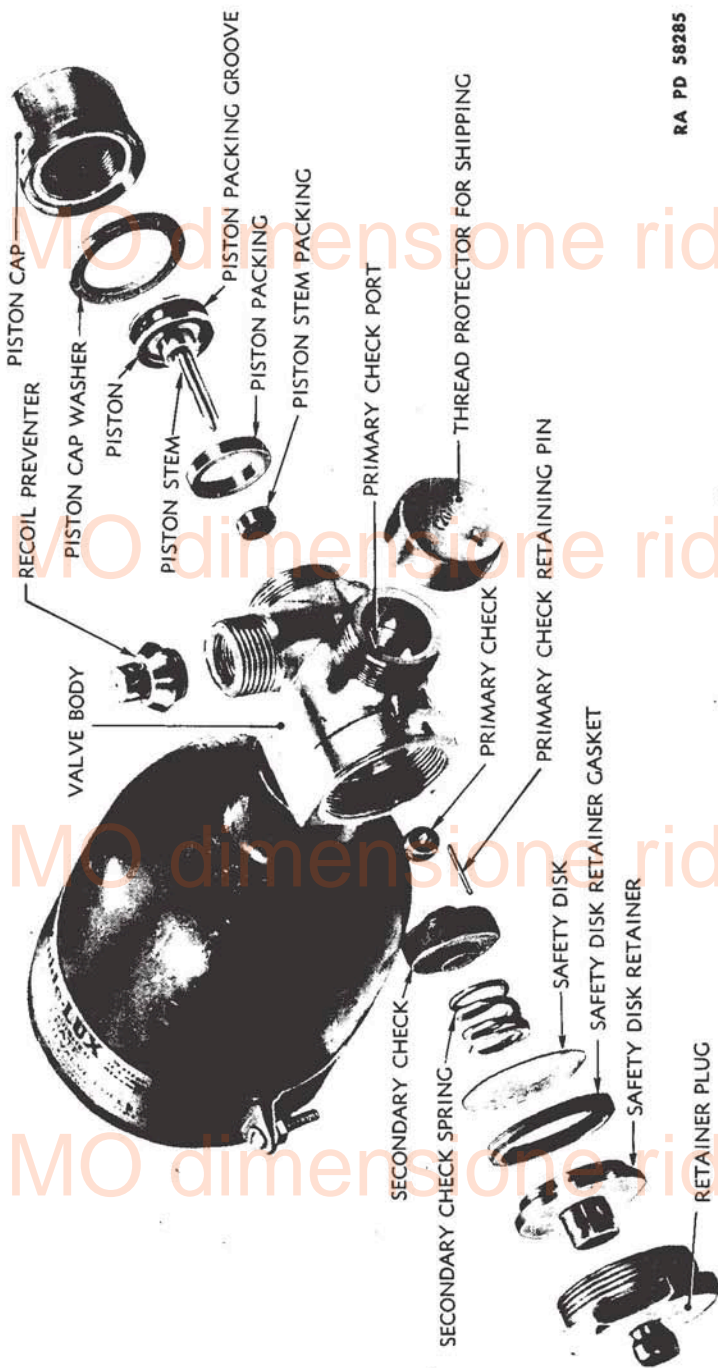


Figure 18 — Kidde-Lux Fire Extinguishers

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RA PD 58285

Figure 20 — Kidde-Lux Valve — Disassembled (7 1/2- And 10-Pound Extinguishers)

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(10) SAFETY DISK RETAINER.

The face of the retainer which contacts the safety disk must be free from all nicks and scratches, and be smooth. Replace any retainer that is not in this condition.

d. Assembly.**(1) EQUIPMENT.**

HAMMER	WRENCH, open-end, $1\frac{5}{8}$ -in.
PLIERS	WRENCH, box, 1½-in.
PLUG, cork, 5/8-in.	WRENCH, box, 1 5/8-in.
PUNCH, pin, $\frac{3}{16}$ -in.	

(2) PROCEDURE (fig. 20).**(a) Install Piston Packing.**

Gently stretch the packing over the piston. The flat face of the packing must be toward the steel piston stem.

(b) Install Piston In Cap.

Place piston in cap and gently wiggle and press to the bottom of the cap (by hand).

(c) Install Piston Stem Packing.

Insert piston stem packing in recess of valve body at piston cap end. The packing must be inserted grooved face first.

(d) Install Piston Cap.

WRENCH, box, 1½-in.

Place the hard washer (with the 8 small holes drilled in it) over the piston cap connection. With the piston still in the cap, place the piston stem through the packing and into the body, and securely screw piston cap onto valve body (1½-in. box wrench). Run sealing wire through valve body hole and the cap hole, and seal.

(e) Install Primary Check.

PLUG, cork, 5/8-in.

Place a cork plug in the valve opening leading to the cylinder. This will prevent the primary check from falling into the cylinder. Place the cylinder horizontally on the work bench with the piston cap pointing down. Place and hold (fingers) the primary check in its recess on the inside of the valve. Then, insert the primary check retaining pin in the small hole, which is drilled in the retaining plug gasket seating surface. Be sure pin also enters the hole on the far side of the check. Remove the

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cork plug. Leave the cylinder in the same position until the retainer plug is installed. This will prevent the primary check pin from falling out.

(f) *Install Secondary Check And Spring.*

PLIERS

Place secondary check (pliers) in place in the valve body. Composition seating surface must go in first. Place spring on secondary check.

(g) *Install Safety Disk.*

HAMMER

WRENCH, box, 1 $\frac{5}{8}$ -in.

Place safety disk in retainer plug opening, and on top of secondary check spring. Lay it on the spring. Do not force it. Place retainer gasket on shoulder of retainer, and tap retainer gently into place, gasket side first. Screw retainer plug into the valve body and tighten securely (1 $\frac{5}{8}$ -in. box wrench).

(h) *Install Recoil Preventer.*

PUNCH, pin, $\frac{3}{16}$ -in.

WRENCH, open-end, 1 $\frac{1}{16}$ -in.

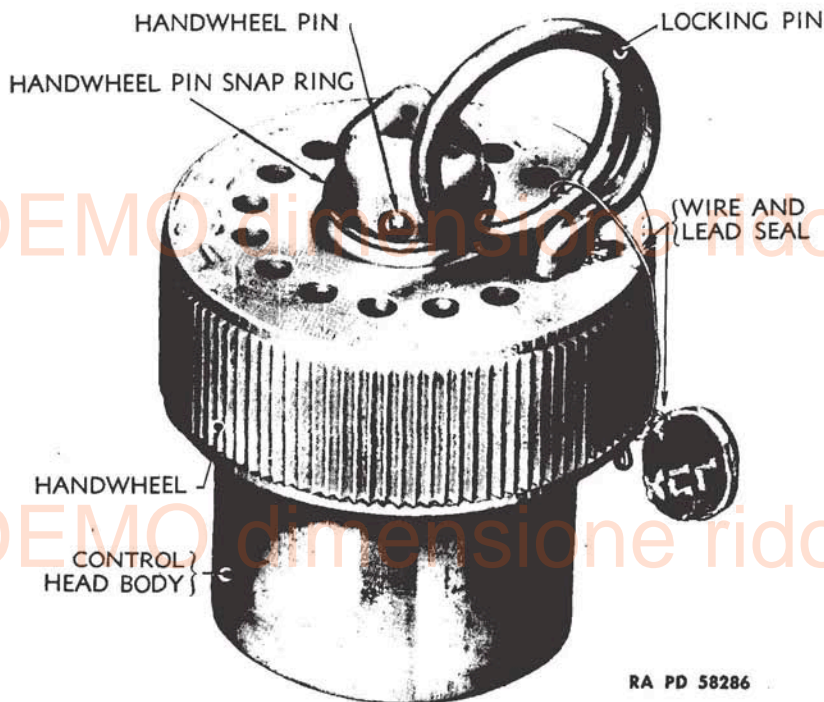
Screw recoil preventer into the valve outlet and tighten (1 $\frac{3}{16}$ -in. pin punch). Place thread protector over recoil preventer and screw tightly to valve outlet (1 $\frac{5}{16}$ -in. open-end wrench).

(i) *Place Thread Protector On Swivel Nut Connection.*

20. HANDWHEEL, CONTROL HEAD, 7 $\frac{1}{2}$ -POUND UNIT (fig. 21).

a. **Description.** This control head is mounted above the primary check, on the body of the valve attached to the 7 $\frac{1}{2}$ -pound fire extinguisher, and is a handwheel control job. When the locking pin is pulled, and the handwheel turned three-quarters of a turn counterclockwise, it depresses the primary check of the valve which starts the valve action and causes the cylinder to completely discharge. The body of the control head is made from a 1 $\frac{1}{2}$ -inch hexagonal brass bar. It has an internal right-hand thread for mounting on the valve, and an internal triple left-hand thread for the control head stem to operate in. It is recessed above the triple thread for the operating stem packing, and a final hole pierces the top to allow the operating stem to project through. The operating stem is made of 1-piece brass, having a triple left-hand thread to operate in the body. The upper end is turned to $\frac{5}{16}$ inch to recurve the packing and the handwheel. The handwheel is a white metal die casting, mounted on the operating stem above the valve body, and is secured by a loose fitting pin which in turn is secured by a ring which is snapped over the top of the handwheel.

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RA PD 58286

Figure 21 — Kidde-Lux Handwheel Control Head
(7½-Pound Extinguisher)

h. Removal And Disassembly (fig. 21).

(1) EQUIPMENT.

PENCIL, or a like stick
SCREWDRIVER

WRENCH, open-end, 1½-in.

(2) PROCEDURE.

(a) Removal.

WRENCH, open-end, 1½-in.

Hold cylinder securely (by hand) and unscrew control head (1½-in. open-end wrench) from body of valve.

(b) Disassembly (fig. 22).

PENCIL, or a like stick

SCREWDRIVER

Pull locking pin. Unhook snap ring (screwdriver) over top of handwheel and remove handwheel pin. Lift handwheel off upper end of operating stem. From the mounting end of the body, turn (fingers) operating

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stem clockwise and remove stem from body. Remove packing from its recess (pencil) by gently pushing through the operating stem hole in the top of the control body, and remove packing from the lower end.

c. Inspection.**(1) VALVE BODY.**

Inspect internal threads on body of control head. Replace any body with burred or damaged threads.

(2) OPERATING STEM.

Stem must be straight and threaded section have free movement in the body. Replace any bent stem or stem with damaged thread.

(3) PACKING.

Packing must be pliable and its grooved face must have sharp, clean cut edges. Replace any packing not in this condition.

(4) HANDWHEEL.

Handwheel must have fairly snug fit on operating stem. Replace any cracked or broken handwheel.

(5) HANDWHEEL PIN.

Pin must have free fit through handwheel and operating stem, and have snap ring attached. Replace damaged pins.

d. Assembly (fig. 22).**(1) EQUIPMENT.****SCREWDRIVER****(2) PROCEDURE.****(a) Install Packing.**

Insert packing in its recess in control head body. Flat face goes in first. Push all the way to the bottom of recess.

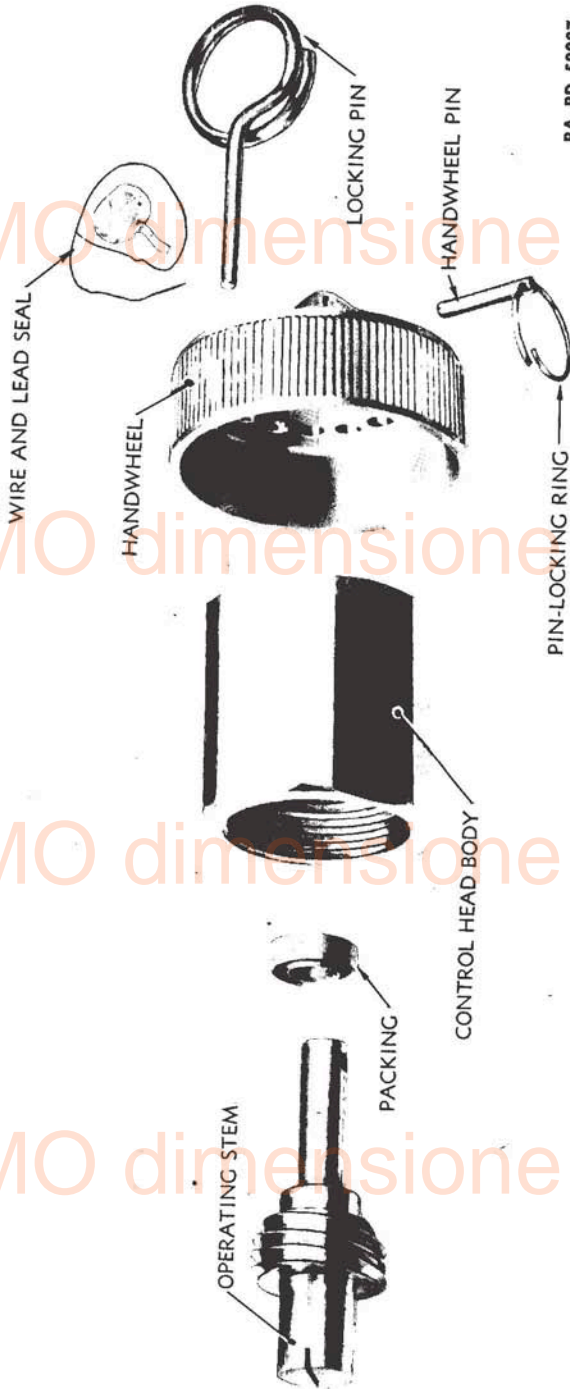
(b) Install Operating Stem.**SCREWDRIVER**

Insert small end of the operating stem through the bottom end of the body, and screw (screwdriver) counterclockwise until it bottoms.

(c) Install Handwheel.

Place handwheel over top of operating stem, and insert pin through handwheel and operating stem. Swing snap ring over the top of the handwheel, and push below the other end of pin. Turn the handwheel clockwise (looking at the handwheel) until the operating stem bottoms. Insert locking pin through handwheel and into control head body. Secure by

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Figure 22 — Kidde-Lux Handwheel Control Head — Disassembled

KIDDE-LUX FIRE EXTINGUISHERS (CO₂)

passing sealing wire through hole in handwheel adjacent to locking pin, and through the locking pin. Pull the wire tightly over the locking pin and handwheel rim, and secure with a lead seal.

e. Installation.

(1) **EQUIPMENT.**

WRENCH, open-end, 1½-in.

(2) **PROCEDURE.**

(a) Make sure handwheel is set and the locking pin sealed.

(b) Screw the control head on the valve of the 7½-pound fire extinguisher above the primary check. Tighten securely (1½-in. open-end wrench).

21. PULL CABLE, CONTROL HEAD, 10-POUND UNIT (fig. 23).

a. Description. This control head is mounted above the primary check, on the body of the valve attached to the 10-pound fire extinguisher. It is controlled by either remote control by pulling a cable, or by a small hand lever at the control head. In either case the control head must be reset by hand, at the control head. The unit is composed of a die-cast body with a brass mounting nut (swivel nut), a die-cast sheave and cam assembly with a steel shaft, a plunger assembly, cover and lever. Pulling the cable or moving the lever rotates the cam which pushes the plunger against and opens the primary check of the fire extinguisher valve, thus discharging the entire content of the cylinder.

b. Removal (fig. 23).

(1) **EQUIPMENT.**

SCREWDRIVER, standard,
6-in.

SCREWDRIVER, 6-in., with
⅛-in. bit

WRENCH, open-end, ½-in.

WRENCH, open-end, 1½-in.

(2) **PROCEDURE.**

(a) *Disconnect Swivel Nut.*

WRENCH, open-end, 1½-in.

Disconnect control head from valve by turning (1½-in. open-end wrench) swivel nut. Lift control head clear of the valve.

(b) *Remove Cover.*

SCREWDRIVER, standard, 6-in.

Remove 3 fillister head machine screws (6-in. standard screwdriver) from the cover, and remove cover. The cable entry fitting is not part of the cover.

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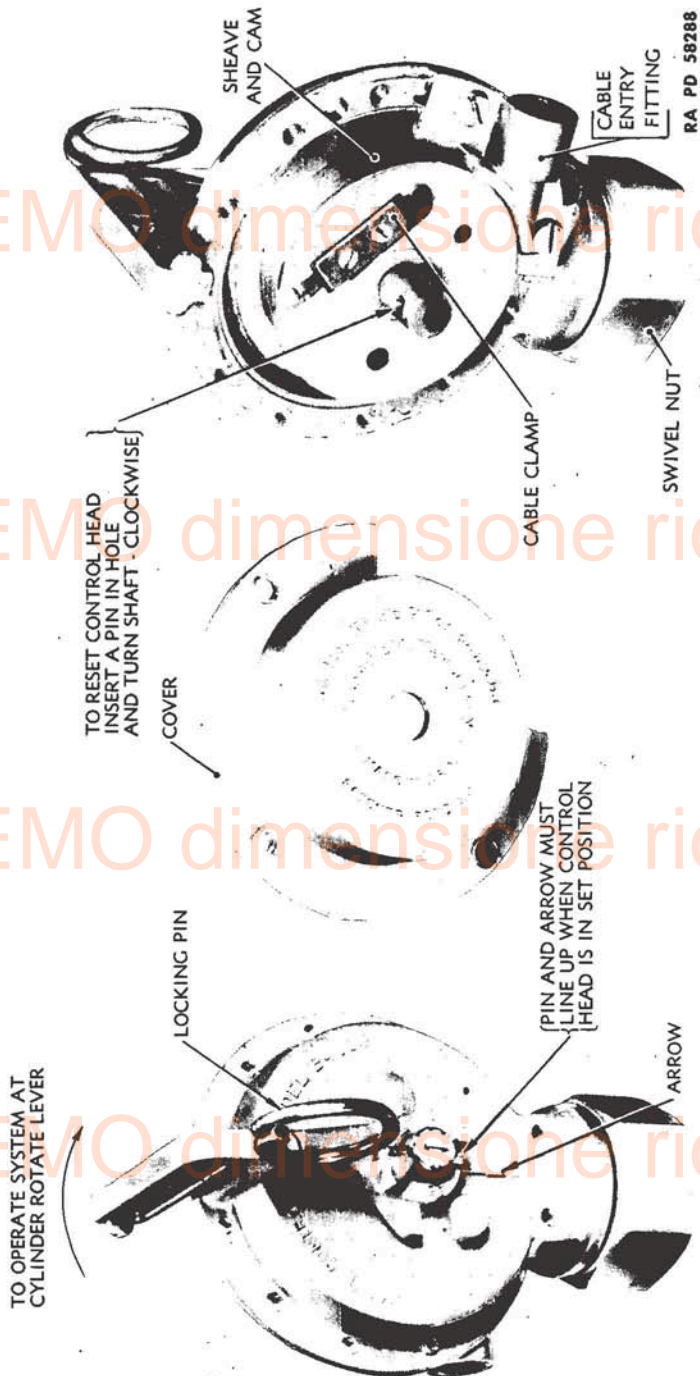


Figure 23 — Setting Of Kidde-Lux Control Head (10-Pound Extinguisher)

KIDDE-LUX FIRE EXTINGUISHERS (CO₂)(c) *Remove Cable.*

SCREWDRIVER, 6-in., with 1/8-in. bit

Loosen the 2 setscrews (6-in. screwdriver, with 1/8-in. bit) in the cable clamp, and remove cable from clamp.

(d) *DISCONNECT TUBING.*

WRENCH, open-end, 1/2-in.

Disconnect tubing (1/2-in. open-end wrench) from cable entry fitting, and remove cable from control head.

c. *Disassembly (figs. 23 and 24).*(1) *EQUIPMENT.*

HAMMER

PLIERS

PUNCH, pin, 3/32-in.

PUNCH, pin, 1/4-in.

SCREWDRIVER, standard,
6-in.SCREWDRIVER, stop plung-
er, special

SCRIBER

(2) *PROCEDURE.*(a) *Remove Pull Lever.*

PLIERS

Break sealing wire and pull locking pin from lever. Pull the 1/8-inch pin (pliers) from the lever end of the shaft. Slide lever from shaft.

(b) *Remove Cam And Sheave Assembly.*

SCREWDRIVER, standard, 6-in.

Remove 5 fillister head machine screws (6-in. standard screwdriver) from the cover and cable entry fitting and remove cover and cable entry fitting. Remove the cam and sheave assembly with shaft (fingers) from body of control head.

(c) *Remove Shaft.*

HAMMER

PUNCH, pin, 3/32-in.

PUNCH, pin, 1/4-in.

Drive 1/8-inch pin (hammer and 3/32-in. pin punch) from the sheave and shaft. Drive shaft (hammer and 1/4-in. pin punch) from sheave and cam casting.

(d) *Remove Stop Plunger.*

SCREWDRIVER, stop plunger, special

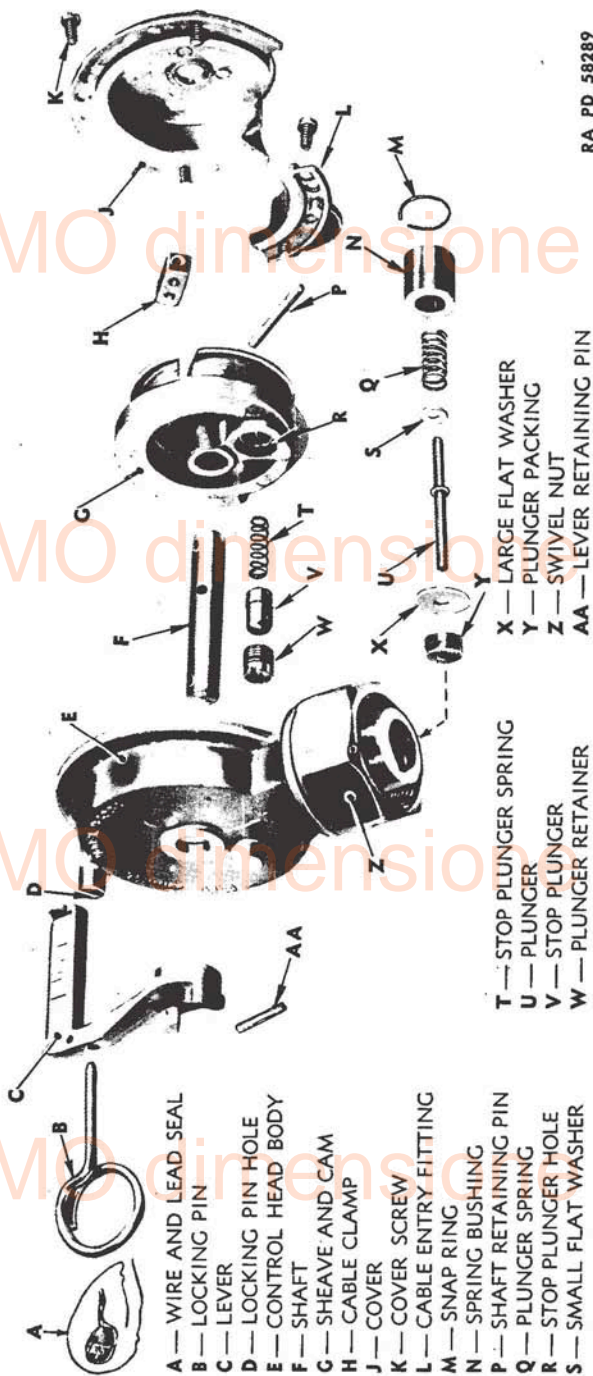
Unscrew plunger retainer (special stop plunger screwdriver) from sheave and cam casting. Remove retainer, stop plunger and stop plunger spring.

(e) *Remove Operating Plunger And Related Parts.*

SCRIBER

Remove the snap ring (scraper) from the recess at the swivel nut end

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Figure 24 — Kidde-Lux, Control Head — Disassembled (10-Pound Extinguisher)

KIDDE-LUX FIRE EXTINGUISHERS (CO₂)

of the control head body. Remove from the recess (fingers) the following: plunger spring bushing, plunger spring, a small flat steel washer, the operating plunger, a large flat steel washer, and the operating plunger packing.

d. Inspection (fig. 24).

(1) INSPECT BODY.

If casting is broken, cracked, the shaft hole worn or the swivel nut thread destroyed, the body must be replaced.

(2) INSPECT OPERATING PLUNGER AND RELATED PART.

Packing must be pliable and the grooved face must have clean, sharp edges. Replace if not in this condition. The operating plunger must be straight. Replace bent plungers. The hole in the flat washers must not be worn. Replace washers with worn holes. The spring must be undistorted and retain its spring tension. Replace springs not in this condition. The plunger spring bushing bore must be large enough to give spring and small washer free movement, and the small hole must allow free movement of the plunger. The snap ring must be a tight fit in its recess. Replace snap rings that have lost their spring tension.

(3) INSPECT CAM STOP PLUNGER.

The stop plunger spring must be unbroken and retain its spring tension. Replace broken or weak springs. The plunger must have free movement in its retainer, and the retainer must have good threads. Replace damaged parts.

(4) CASTINGS.

Replace any cracked or broken casting.

e. Assembly (fig. 24).

(1) EQUIPMENT.

HAMMER

SCREWDRIVER, standard,

PLIERS

6-in.

PUNCH, pin, $\frac{3}{32}$ -in.

SCREWDRIVER, stop plunger, special

(2) PROCEDURE.

(a) Install Operating Plunger And Related Parts.

SCREWDRIVER, standard, 6-in.

Place plunger packing in recess in swivel nut connection. Flat side of packing must go in first and must rest in the small recess in the bottom. The grooved face will then be facing outward. Place large flat washer against grooved face of packing. Insert operating plunger through the flat washer and packing. The long section with the rounded end goes in

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first. Place small flat washer on operating plunger, then, the spring and the spring bushing. Press spring bushing in recess and secure by installing the snap ring (6-in. standard screwdriver) in the groove of the recess.

(b) Install Stop Plunger.

SCREWDRIVER, stop plunger, special

Insert spring and stop plunger in sheave casting and secure by screwing (special stop plunger screwdriver) plunger retainer tightly over plunger and into sheave.

(c) Install Shaft.

HAMMER

Press the shaft in the cam and sheave casting with the longer section of the shaft on the stop plunger side. Aline the center hole in the shaft with the $\frac{1}{8}$ -inch hole in the face of the sheave. Drive the $\frac{1}{8}$ -inch pin in the sheave and through the shaft until the end of the pin is flush with the face of the sheave.

(d) Install Cam and Sheave Assembly.

Install cam and sheave assembly in control head body. Long end of shaft, that is on cam side of the assembly, goes through the center hole in body. The stop plunger is positioned over the indentation opposite the stop lug in the body.

(e) Install Cover And Cable Entry Fitting.

SCREWDRIVER, standard, 6-in.

Place cable entry fitting in desired position on body, and secure with 2 fillister head machine screws (6-in. standard screwdriver). Place cable clamp in its slot on the sheave. Place cover over end of shaft and sheave, and secure with 3 fillister head machine screws (6-in. standard screwdriver).

(f) Install Lever.

HAMMER

PLIERS

Place lever over end of the shaft protruding from the back of the body, with the handle of the lever overhanging the control head. Nick the middle of the $\frac{1}{8}$ -inch pin so that it will be tight in the shaft. Insert pin in hole of shaft outside of lever and tap in place (hammer).

(g) Set Control Head.

PUNCH, pin, $\frac{3}{32}$ -in.

Place pin punch in hole of shaft on cover end. Turn shaft clockwise until the pin in shaft on the other side of the head lines up with arrow

KIDDE-LUX FIRE EXTINGUISHERS (CO₂)

cast in the body. In this position, the stop plunger on the cam drops into the indentation on the inside of the body. Watch the operating plunger at the swivel nut; it must move about $\frac{3}{8}$ inch when the lever is moved as far as it will go toward the swivel nut. Reset shaft, insert locking pin through lever and into body of control head. Secure by passing sealing wire through the hole in the lever and tighten around the locking pin and seal with lead seal.

f. Installation.

(1) EQUIPMENT.

SCREWDRIVER, standard,
6-in.

SCREWDRIVER, 6-in., with
 $\frac{1}{8}$ -in. bit
WRENCH, open-end, 1½-in.

(2) PROCEDURE.

(a) *Remove Cover And Cable Entry Fitting.*

SCREWDRIVER, standard, 6-in.

Remove 5 machine screws from cover and cable entry fitting, and remove:

(b) *Connect Cable Tubing.*

Pass pull cable through cable entry fitting, and loosely fasten cable tubing to cable entry fitting.

(c) *Install Cable To Sheave.*

SCREWDRIVER, standard,
6-in.

SCREWDRIVER, 6-in., with
 $\frac{1}{8}$ -in. bit

Pass 2 turns of the cable around the sheave. Install cable entry fitting in desired position on control head body, and secure with 2 machine screws (6-in. standard screwdriver). Place the cable end through the cable clamp so that the clamp will just drop into the recess on the sheave. Tighten setscrews (6-in. screwdriver with $\frac{1}{8}$ -in. bit) of the cable clamp tightly on cable.

(d) *Install Control Head Cover.*

SCREWDRIVER, standard, 6-in.

Install cover over cable sheave and secure with 3 machine screws (6-in. standard screwdriver).

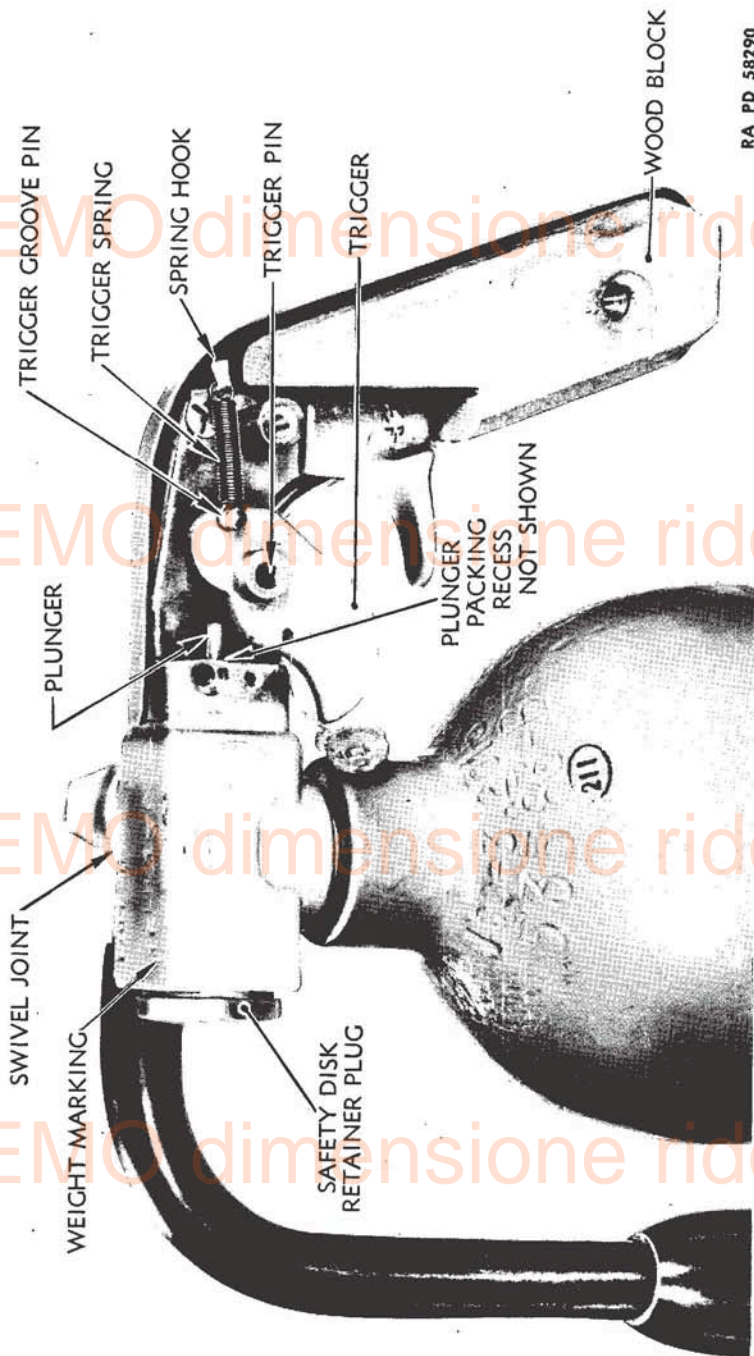
(e) *Install Control Head To Valve.*

WRENCH, open-end, ½-in.

WRENCH, open-end, 1½-in.

Place control head on valve of cylinder, and screw swivel nut (1½-in. open-end wrench) on valve body securely. Tighten cable tube connection (½-in. open-end wrench) tightly to cable entry fitting.

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Figure 25 — Kidde-Lux Trigger Grip Valve With Handle Cover Removed

KIDDE-LUX FIRE EXTINGUISHERS (CO₂)

22. KIDDE-LUX TRIGGER GRIP VALVE, 4-POUND UNIT.

a. **Description** (fig. 25). The Kidde-Lux trigger grip valve is the equipment placed on the 4-pound portable fire extinguisher for controlling the discharge of carbon dioxide from the cylinder. It is composed of a main body of bronze which contains a valve check backed up with a spring, a check stem, and a cam with trigger which when pulled opens the valve check. A swivel joint is attached to the discharge stud to which is attached the discharge tube and horn. The valve check spring is backed up with a safety disk which is secured to the valve body by a screw plug retainer. This disk is calibrated to rupture at 2600 pounds. When this disk ruptures, the entire content of the cylinder bypasses the valve check and is discharged through the discharge horn. A handle of stamped sheet brass is attached to the valve to provide a means of carrying the extinguisher to the scene of the fire.

b. **Disassembly.** NOTE: Be sure cylinder is completely empty before starting any disassembly.

(1) EQUIPMENT.

HAMMER

PLIERS

PUNCH, pin

ROD, brass, 1/8 x 6-in.

SCREWDRIVER, cross recess
head

WRENCH, box, 1-in.

WRENCH, open-end, 3/8-in.

(2) PROCEDURE (figs. 25 and 26).

(a) *Remove Safety Disk And Valve Check.*

WRENCH, box, 1-in.

Unscrew and remove (1-in. box wrench) the safety disk retainer plug and the composition plug gasket from the valve body. With your hand over the plug opening, turn valve with plug opening downward and shake the following parts from the plug opening: safety disk, safety disk guard, valve check spring, and the valve check.

(b) *Remove Discharge Horn.*

Unscrew by hand the discharge horn from the discharge tubes.

(c) *Remove Discharge Tube.*

Unscrew by hand the discharge tube from the swivel joint.

(d) *Remove Swivel Joint.*

HAMMER

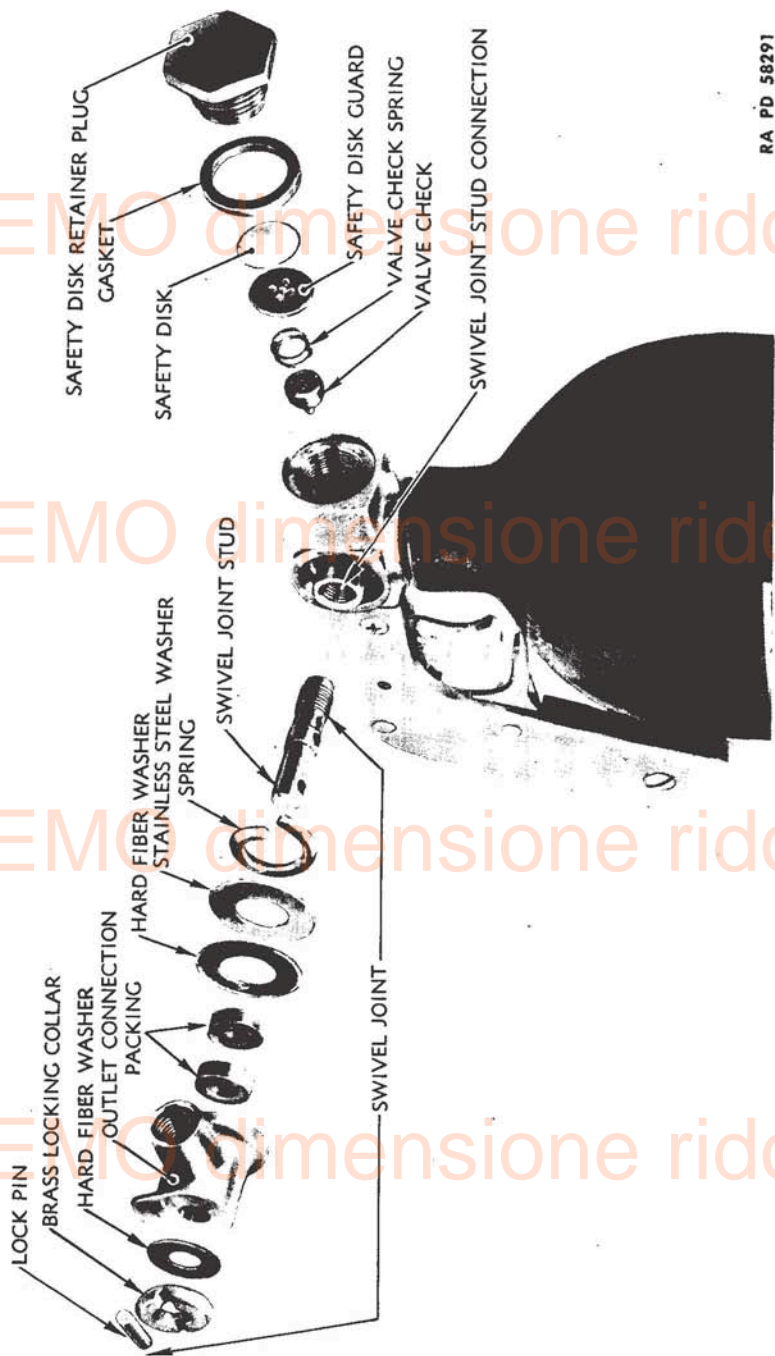
PLIERS

PUNCH, pin

WRENCH, open-end, 3/8-in.

Tap lock pin (hammer and pin punch) partly from its hole in end of the stud; then pull (pliers) it all the way out. Remove from the stud in

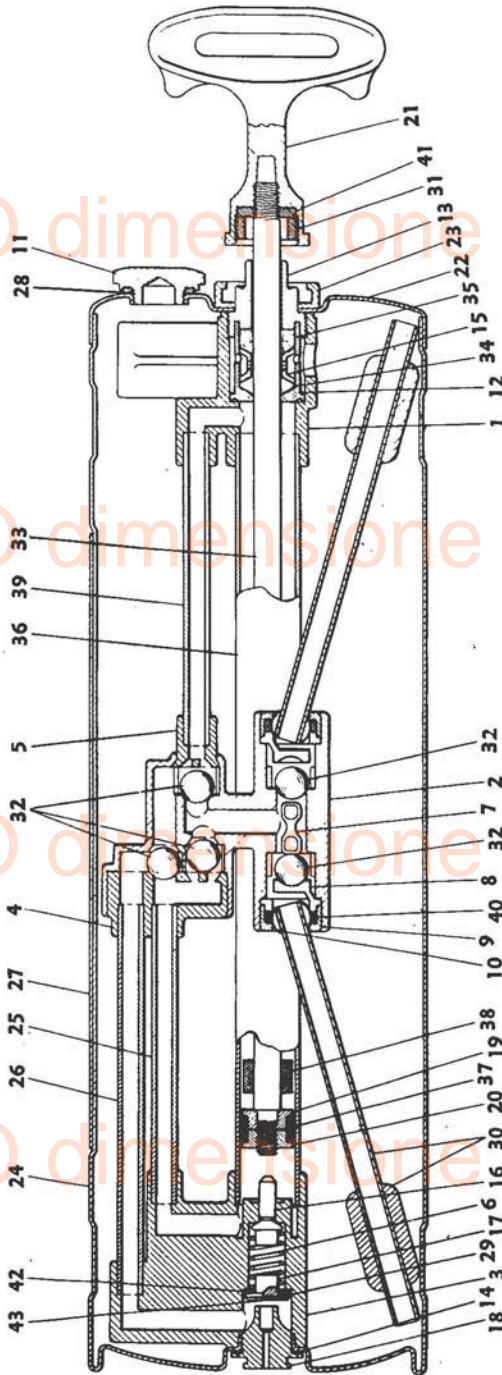
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Figure 26 — Kidde-Lux Trigger Grip Valve — Disassembled

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RA PD 58317

Figure 29 — O-Fire-Gun Fire Extinguisher

O-FIRE-GUN FIRE EXTINGUISHER (CCI,)

ITEM	NAME
1	PACKING BOX CASE
2	CHECK VALVE BODY
3	SHUTOFF VALVE BODY
4	LOWER VALVE TUBE FLANGE
5	UPPER VALVE TUBE FLANGE
6	SHUTOFF VALVE SPRING
7	BALL SEPARATOR
8	INNER SOCKET
9	OUTER SOCKET
10	BALL SLEEVE
11	FILLER PLUG
12	PACKING BOX
13	PACKING BOX CAP
14	NOZZLE GASKET
15	PACKING GLAND
16	NOZZLE PLUNGER
17	SHUTOFF VALVE RETAINER
18	REMOVABLE NOZZLE
19	PISTON UPPER FLANGE
20	PISTON LOWER FLANGE
21	HANDLE
22	TOP CAP
23	HANDLE LOCK
24	SHELL
25	LOWER VALVE TUBE
26	DISCHARGE TUBE
27	NAME PLATE
28	FILLER PLUG GASKET
29	SHUTOFF VALVE DISC
30	SUCTION TUBE & WEIGHT
31	HANDLE SEAL LOWER GASKET
32	BALL
33	PISTON ROD
34	PACKING
35	PACKING FELT
36	PUMP CYLINDER TUBE
37	PISTON FLANGE FELT
38	PISTON BUMPER FELT
39	UPPER VALVE TUBE
40	SOCKET FELT
41	HANDLE SEAL UPPER GASKET
42	SHUTOFF VALVE GASKET
43	SHUTOFF VALVE FACER

RA PD 58318

Legend For Figure 29—O-Fire-Gun Fire Extinguisher

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Figure 30 — O-Fire-Gun Fire Extinguisher — Disassembled

O-FIRE-GUN FIRE EXTINGUISHER (CCI,)



RA PD 66024

Figure 31 — O-Fire-Gun Fire Extinguisher

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e. Inspect the discharge nozzle for good, clean, clear opening. Replace any nozzle not having a perfect orifice.

d. Inspect the discharge nozzle gasket. Replace if not in perfect condition.

e. Inspect the shutoff disk assembly. If the seat is scratched, nicked, or marked from the nozzle, it should be replaced.

f. Inspect the shutoff gasket. If not in perfect condition, replace.

g. Inspect the shutoff valve spring. If broken or out of shape it must be replaced.

h. Inspect the nozzle plunger. Plunger must be free of nicks, not bent, and have free movement in its operating position. Replace any plunger not meeting these conditions.

i. Inspect the extinguisher shell for breaks, cracks, or badly dented condition. Do not repair. Replace with a new extinguisher.

37. ASSEMBLY.

a. Equipment.

PLIERS

WRENCH, nozzle, No. 13-233

WRENCH, box

b. Procedure.

(1) Turn extinguisher bottom side up. Install through the discharge nozzle opening in the following order: nozzle plunger, shutoff valve spring, shutoff disk gasket, shutoff valve disk assembly, discharge nozzle gasket, and secure by tightly screwing the nozzle in the bottom.

(2) Install top and bottom gaskets in handle.

(3) Hold piston rod firmly with pliers (protect rod from nick with a piece of sheet brass) and screw handle securely on rod.

(4) Push handle in locking recess and give one-quarter turn to lock.

(5) Fill extinguisher with fluid and install gasket and filling plug securely.

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[A.G. 062.11 (4-8-43)
O.O. 461/10473 O.O. (4-23-43)]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:
J. A. ULIO,
*Major General,
The Adjutant General.*

DISTRIBUTION: R 9(4); Bn 9(2); C 9(8).

(For explanation of symbols, see FM 21-6)