CARBON DIOXIDE TYPE FIRE EXTINGUISHERS

1. GENERAL

1.01 Carbon dioxide type fire extinguishers are used for fighting incipient fires in wires, cables, racks, switchboards, power machinery and in certain locations involving flammable liquids. Since the gas is harmless to the equipment, these extinguishers should be used wherever it is possible to get the nozzle within about 2 feet of the flames.

1.02 Extinguishers of two capacities are in use, one containing about 10 pounds of carbon dioxide and the other an older model, replacement of which is recommended in Paragraph 6.12 of this practice, containing about 7-1/2 pounds. The 10-pound extinguisher supersedes the 7-1/2-pound.

1.03 Two types of 10-pound extinguishers are used, their principal difference being in the method of operation. One type releases the gas by rotating a hand wheel and the other by pressure on a trigger. The 10-pound trigger operated extinguisher supersedes the older hand wheel type. Existing hand wheel operated extinguishers should, however, be continued in service as they are considered as providing the same fire protection as the newer type. Hand wheel type extinguishers of 10-pound capacity have been furnished in two over-all weights differing by about 5 pounds. To readily identify these two extinguishers, a yellow mark is furnished on the front of the cylinder of the ligher weight extinguisher. The trigger release extinguisher is about the same weight as the lighter of the two hand wheel types.

1.04 This section is reissued to:

(a) Recommend replacement of 7-1/2-pound carbon dioxide extinguishers.

(b) Recommend periodic replacement of hose assemblies.

(c) Recommend pressure testing of cylinders at time of recharge.

(d) Refer to double numbered Section H43.010, H54.601, "Distribution of Fire Protective Apparatus" of Bell System Practices.

(e) Include changes in certain wording and rearrangement of the text. Arrows are used to indicate changes throughout the text.

1.05 For operation and maintenance application, this section is double numbered with this issue and the same issue number is assigned for uniformity.

2. DESCRIPTION

2.01 Each extinguisher consists of a steel cylinder containing carbon dioxide under pressure which is discharged as a gas through a hose and a cone shaped nozzle when released. A general view of the 10-pound extinguisher having trigger release is shown by Fig. 1, and the 10-pound hand wheel release unit is shown by Fig. 2.

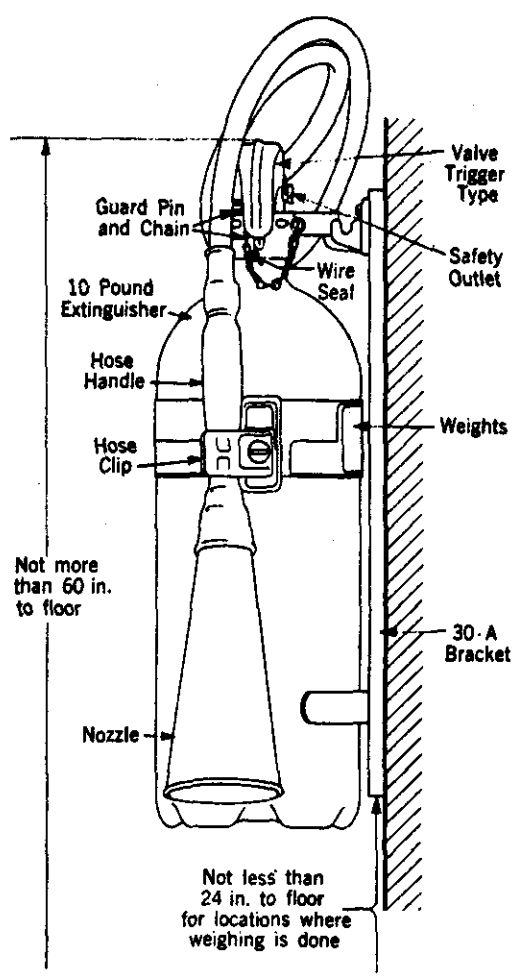

Fig. 1 - New Design with Trigger

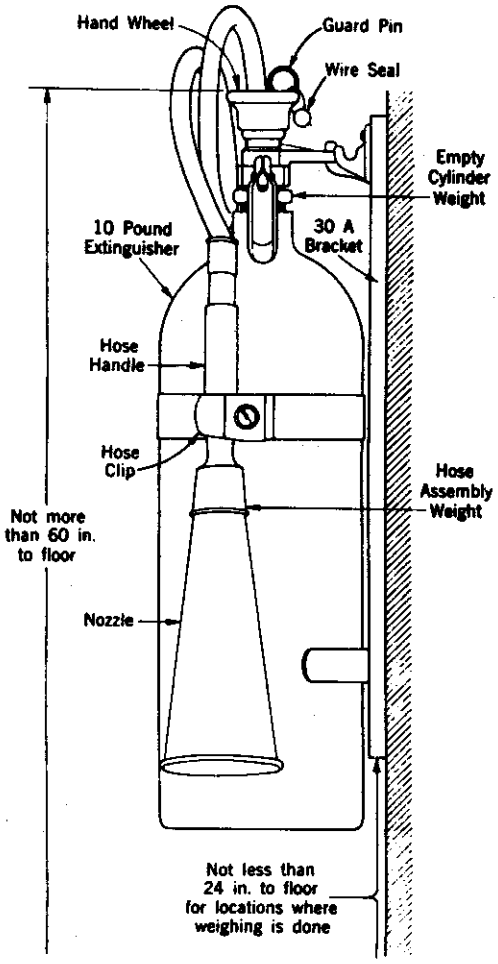

Fig. 2 - Former Design with Hand Wheel

2.02 The gas is most effective when used within about 2 feet from the fire and the discharge for both the 10-pound and the 7-1/2-pound extinguishers continues for 40 to 45 seconds. The gas has no appreciable cooling effect in fighting fires, but extinguishes the flames by its smothering action. In the case of burning fat such as in a cafeteria deep fat fryer care should be exercised that the force of the gas as it is discharged does not spatter the hot fat.

2.03 During the discharge of the extinguisher, solidified gas in the form of "snow" appears in the gas cloud and collects on the floor and other surfaces for a few moments until it evaporates. This "snow" is extremely cold and should not be handled, as frostbite may result.

2.04 Valve - 10-Pound - Trigger Release: Internally this valve has a main and an auxiliary valve seat. Operation of the trigger initially opens the auxiliary valve which admits full gas pressure to both sides of the main valve seat. Further pressure of the trigger opens the main valve with little effort. When not in use both valves are held closed not only by spring pressure but by full pressure of the gas within the cylinder. The trigger can be latched in the open position or can be released at will to stop the flow of gas, thereby permitting temporary conservation of the gas for use on any rekindling action which may occur after the fire has apparently been extinguished. To prevent inadvertent operation, the trigger is locked in the inoperative position by a pin having chain attachment to the body of the extinguisher. The pin must be withdrawn to permit operating the trigger. A wire seal is provided which is broken by operating the trigger, thus furnishing a visible means for determining whether the extinguisher has been operated.

2.05 Valve - 10-Pound Hand Wheel Release: This valve also can be closed after it has been opened, thereby permitting temporary conservation of the gas. The seal is, however, only temporary and is not sufficiently tight to retain the gas for more than a short time. The valve is provided with a guard pin which prevents accidental operation of the hand wheel by fixing it in position. A wire seal gives a visual indication of whether the guard pin and hand wheel have been tampered with. To use the extinguisher it is first necessary to withdraw the guard pin, which operation breaks the wire seal.

2.06 Valve 7-1/2-Pound: The valve on the 7-1/2-pound extinguisher cannot be closed once it has been opened. A hand wheel guard is available for this extinguisher to minimize the possibility of tampering with the hand wheel and discharging the extinguisher while on the mounting bracket. This guard is shown by Fig. 3 and should be provided only in cases where tampering might be expected.

2.07 Safety Cap - 7-1/2-Pound: A safety cap is provided on the 7-1/2-pound extinguisher for use during shipment when the hose is not in place on the extinguisher. It is important that during shipment and storage this cap be in place, since otherwise if the extinguisher is accidentally discharged there is considerable recoil; also the cap provides a

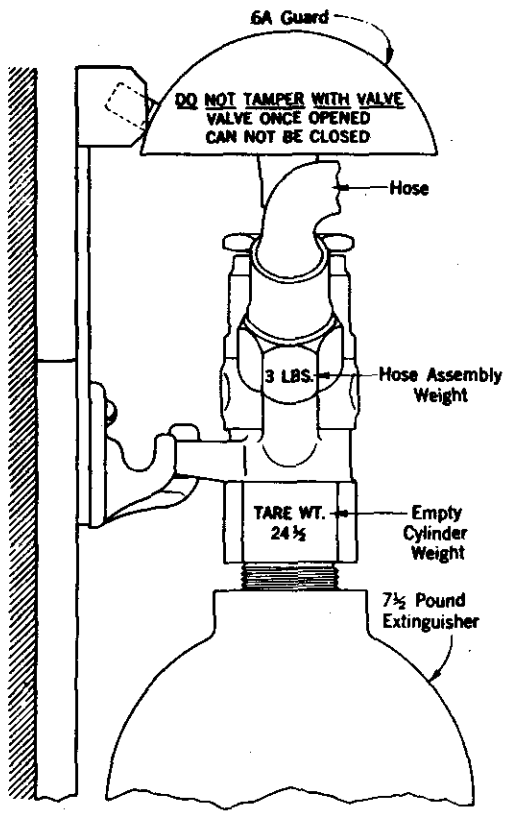

Fig. 3

desirable mechanical protection for the threads of the valve outlet. When not on the valve outlet, this cap is normally attached to a bushing on the extinguisher handle. The 10-pound extinguishers are so designed that separate safety caps are not required.

3. LOCATION

3.01 Carbon dioxide type fire extinguishers may be used in both heated and unheated spaces occupied by telephone equipment.

3.02 The carbon dioxide gas is subject to a rapid rise in pressure where temperatures above normal are experienced. It is desirable, therefore, to locate these extinguishers away from hot surfaces and out of the direct rays of the sun. In general, the clearance between extinguishers and radiators or uncovered heating pipes should be at least 2 feet. This distance may be reduced to 6 inches in the case of covered pipes.

3.03 The general procedure to be followed in distributing fire protective apparatus throughout telephone buildings is outlined in Section H43.010, H54.601 of Bell System Practices.

4. MOUNTING

4.01 10-Pound: The 10-pound extinguishers should be mounted as shown by Fig. 1 and Fig. 2 and if necessary the lower guides bent to hold the cylinder in a vertical position. If a mounting bracket for the 7-1/2-pound extinguisher only is available, it may be adapted to mount the 10-pound extinguishers by obtaining Guide P243864 and fastening it in the mounting holes for the gloves container.

4.02 7-1/2-Pound: The 7-1/2-pound extinguisher if retained in service is mounted as shown by Fig. 1 and Fig. 2 and the lower guides bent to hold the cylinder in a vertical position. Most of the 7-1/2-pound extinguishers have the long mounting brackets shown by Fig. 4 and where these are available they should be used for mounting.

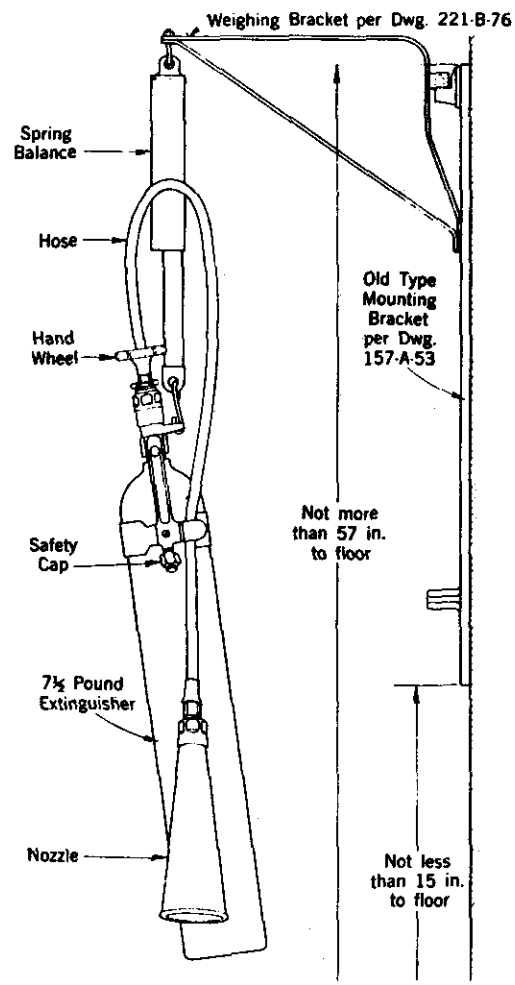

Fig. 4

4.03 Mounting Brackets: The 30A bracket shown for the 10-pound extinguishers is a universal type which is used for the 7-1/2-pound carbon dioxide type if retained in service, the water type, the soda-acid type, and the foam type extinguishers. This bracket replaces the bracket per Drawing 157-A-53 shown by Fig. 4. To insure that a hand wheel operated 10-pound extinguisher of lighter weight (yellow mark on cylinder) is returned to a given location, a yellow mark should be applied with multiple marking paint to the bracket at such location.

4.04 Where extinguishers are placed on free standing columns, arrangements for mounting may include metal bands encircling the column, or if their locations have been predetermined, consideration should be given to including mounting arrangements when the columns are constructed.

4.05 The extinguishers are shipped fully charged and completely assembled for use except that the hose is not attached to the valve. In mounting the extinguishers on the brackets the following directions should be carried out:

(a) Remove the cork or plug from the valve end of the hose which is provided during shipment to protect the inside of the hose from foreign particles.

(b) Inspect the orifice through the nozzle to see that the opening is free.

(c) 7-1/2-Pound Only: Remove the safety cap from the valve outlet and attach it to the lower end of the handle.

(d) Attach the hose securely to the valve with the aid of a wrench.

(e) The extinguisher should be weighed before placing it in service, as outlined in Paragraphs 6.02, 6.03 and 6.04.

(f) 7-1/2-Pound Only: After placing the extinguisher in position on the mounting bracket remove the safety clip around the valve stem which is provided to prevent accidental operation of the valve during shipment.

5. METHOD OF OPERATION

5.01 To operate the extinguisher, proceed as follows:

(1) Remove extinguisher from mounting bracket and carry it to the fire.

(2) 10-Pound Only: Remove the guard pin.

(3) Remove nozzle from the clip and direct at fire. Open hand wheel valve by turning hand wheel to the left. For extinguishers having trigger control, open the valve by upward pressure of the index finger on the trigger. This valve may be latched in the open position, if desired, by pulling the trigger up and forward (toward the valve body). Keep hand on top of 7-1/2-pound extinguisher to prevent its falling.

(4) Direct discharge at base of fire with nozzle about 1 foot from fire, if possible.

(5) Starting at the base of the flames, move nozzle slowly from side to side and work generally upward on the flame area but quickly return below momentarily to wipe out such rekindling as may occur so far as it may be consistent to do so with the fire conditions prevailing above.

(6) While carbon dioxide will continue to be discharged, the extinguisher is ineffective after the discharge of "snow" ceases and, if required, another extinguisher should be brought into play at this time.

(7) 10-Pound Only: If the fire is extinguished before the effective discharge is completed, the discharge may be stopped by turning the hand wheel to the right, or by releasing the trigger to its normal position, as the case may be.

(8) Any glowing embers remaining after the discharge of the gas should be snuffed out with asbestos gloves.

(9) Do not return discharged or partially discharged extinguishers to their mounting brackets. They should be forwarded for recharge in accordance with local instructions. Where recharging is accomplished by the Western Electric Company arrangements will be made for the pressure testing of the cylinders of the extinguishers in accordance with the requirement of the Interstate Commerce Commission (Bureau of Explosives). Where recharging is handled locally it is recommended that arrangements be made with the concerns doing the recharging to accomplish the retesting of cylinders as required by the Interstate Commerce Commission. The date of the last test of the cylinder is stamped on it.

6. MAINTENANCE

(A) Inspection

6.01 Carbon dioxide type extinguishers should be inspected at intervals for the following items:

(1) 7-1/2-Pound Only: That the safety clip has been removed from around the valve stem.

(2) 10-Pound Only: That the wire seal is not broken. If broken, extinguisher should be weighed.

(3) Hose is in good condition especially at couplings.

(4) Nozzle is not broken and orifice is unobstructed.

(5) Hose coupling is tight at cylinder outlet and at nozzle.

(6) Hose is looped back over valve handle and held in place by clip on side of extinguisher in such a way that lower edge of nozzle is slightly above bottom of extinguisher.

(7) Finish is in good condition.

(8) Mounting bracket is securely fastened to wall.

(9) Record tag is attached and extinguisher has been weighed within the required time.

(B) Weighing

6.02 Extinguishers should be weighed at least once a year to make sure they are in proper condition for immediate use. An inspection of the items mentioned in Paragraph 6.01 should also be made at this time.

Method

6.03 Weighing of extinguishers should be done with the aid of a spring balance coded No. 120, manufactured by John Chatillon and Sons of New York. The spring balance should be supported by a weighing bracket arranged to be attached to the hook or the extinguisher mounting bracket. This arrangement is shown by Fig. 4.

6.04 Both the 10-pound hand wheel type and the 7-1/2-pound extinguishers have the weight of the empty cylinder stamped on the valve and the weight of the hose assembly stamped on the hose coupling. The 10-pound trigger type has the weight of both the empty cylinder and of the hose assembly stamped on the name plate at the rear of the hose clip. To determine if the extinguisher is in proper condition for immediate use, the following conditions should be met irrespective of any instructions that may be on the name plate:

The total weight (by spring balance) should not be less than:

STAMPED CYLINDER WEIGHT

plus

STAMPED HOSE ASSEMBLY WEIGHT

plus

5 POUNDS

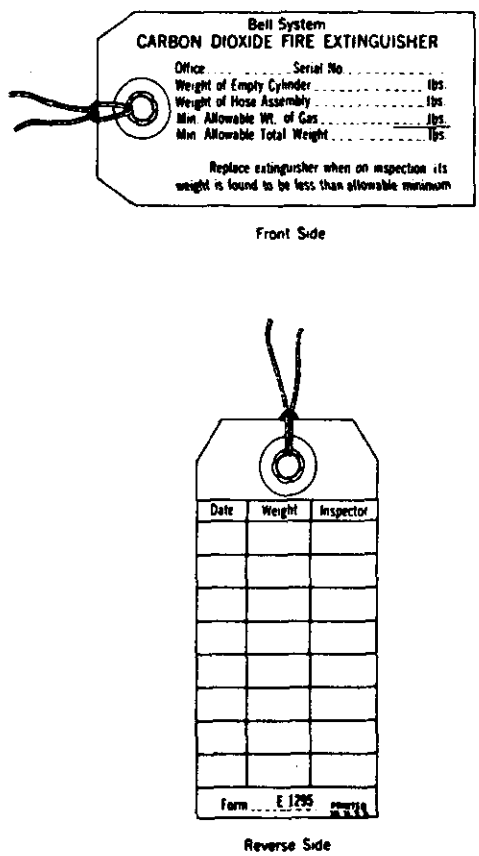

Fig. 5

Recording Weight

6.05 If the extinguisher is within the required weight limit and otherwise satisfactory, it should be returned to its mounting bracket and the weight recorded on the tag provided for this purpose. This tag is shown by Fig. 5.

6.06 Extinguishers which do not meet the requirements should be discharged, and then forwarded for recharge in accordance with local instructions.

6.07 Although the extinguishers are designed with an ample factor of safety and will withstand a reasonable amount of rough usage, care should be exercised while weighing or otherwise handling them to avoid dropping or subjecting the cylinder or valve to an excessive strain.

6.08 The finish of the extinguisher cylinder should be examined and painted as required. The hose should not be painted.

6.09 When returning discharged extinguishers the hose assembly should be disconnected from the extinguisher and in the case of the 7-1/2-pound type the safety cap should be placed over the valve opening.

6.10 The hose assemblies for the 10-pound and 7-1/2-pound extinguishers are not interchangeable. The hose assemblies for the two 10-pound hand wheel control extinguishers of different weights are interchangeable. The hose assembly for the 10-pound trigger control extinguisher is not interchangeable with those of any of the foregoing extinguishers.

(C) Replacement

6.11 The replacement of all remaining 7-1/2-pound extinguishers with the 10-pound unit per KS-14137 is recommended.

6.12 In view of the indicated approximate 10-year service life of the hose assembly and the difficulties involved in pressure testing them, it is suggested that the hose assemblies of 10-pound and larger size carbon dioxide extinguishers be replaced on a 14-year basis. To assist in this replacement the date of manufacture such as (53) is stamped into the metal couplings of hose assemblies of new extinguishers and on all replacement assemblies. For extinguishers obtained prior to the introduction of this procedure it is suggested that the earliest date appearing on the extinguisher body be considered as the date of manufacture of the hose assembly.