The Theatreman's

WARTIME GUIDE

How to continue operation under wartime restrictions. How to prolong the life of your equipment. For owners of all makes and models of equipment. Written for the layman.

Read and keep for future reference.

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PUBLISHED AS A PATRIOTIC SERVICE

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THIS BOOK CONTAINS NO ADVERTISING EXCEPT ON PAGE 64

With suggestions on

CARE OF EQUIPMENT

USE OF SUBSTITUTE MATERIALS

HOW TO MEET EMERGENCIES

TROUBLE-SHOOTING

CIVILIAN DEFENSE

and

FIRST AID

Quiz Yourself

How many of these questions can you answer?

The Theatreman's WARTIME GUIDE

First Printing

April, 1942

COMPLIMENTS OF

WARTIME EMERGENCY SERVICE DEPARTMENT

The Strong Electric Corporation

Toledo, Ohio, U. S. A.

A FREE COPY of this book will be sent to anyone who may request it and irrespective of the make or model of equipment they may own, as long as the supply lasts, **BUT**

Please make good use of it!

Don't throw it away!

In this time of stress and anxiety, wholesome amusements can play a big part in upbuilding and maintaining the public morale.—FRANKLIN D. ROOSEVELT.

A Word From The Author —

This is a book for which prior to Dec. 7, 1941 there was no need. Today a copy of it should be carried by every employee of every theatre in America.

There is hardly a manager but who realizes the importance of "the things to come," of the necessity of preparing for them as well as possible.

We who are responsible for the continued uninterrupted operation of America's theatres, to which have been delegated the tasks of maintaining and upbuilding the morale of the public, have accepted the job willingly and with a determination to see it done well. We must "keep 'em showing"!

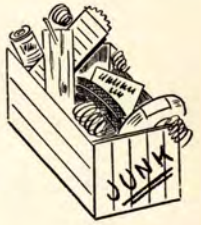
This book is packed with the vitally important information for which such a demand has arisen. It has been compiled from many sources and edited from but one viewpoint, that of serving our industry. Selfish motives have no place in the plans which are being made to the end that we shall realize our country's inevitable victory in the shortest possible time.

We have a pattern of wartime theatre operation as it has applied to England; the theatre over here has absorbed the first impact of the conflict; we know the meaning of "priorities," and the mist is clearing from the picture of the things we may expect in the future. Some things to come, which will importantly apply to the theatre, are unpredictable. New conditions may be imposed which today are unimaginable. As they appear on the horizon we shall currently analyze them to the best of our ability, and further advise you as to how best to meet them.

Harry N. Strong

Hitler Throws a Monkey-Wrench —And It's Intercepted By The Theatre Equipment Manufacturers

Before this war is over theatremen will probably have to learn how to use many substitute materials, carbons that are modified from those to which we are accustomed and which have different burning characteristics, and rectifier and power amplifier tubes which will be of inferior quality because of the elimination of vital materials. They will have to know how to cope with amperage which is less than that for which carbons and equipment were designed; and may have to recover old, previously discarded materials and be glad to have them.



Conditions are going to be set up which will result in difficulties in operation which will be beyond the scope of knowledge of the average projectionist to correct. This is in no wise a reflection on the ability of that individual, for he is not expected to have a thorough understanding of the principles which have been engineered into the equipment which he operates. It will be absolutely necessary that he rely on the technical assistance of the manufacturers of projectors, generators, tubes, brushes, lamps, rectifiers, sound systems and other equipment if he is to meet this wartime challenge.

Fortunately, the manufacturers all consider it a patriotic duty to render this service. Faced with priorities, engineering and technical problems that will try the genius, beset by material shortages, and confronted with the biggest servicing chore ever cut out for an industry, these manufacturers are attacking this work, with

no possibility of, nor desire for, personal gain, yet with a determination to do a bang-up job for you in the cause of Uncle Sam.

As conditions change and the use of new materials becomes necessary, these manufacturers' laboratories will analyze them, making complete tests in actual use, and keep you advised as to what to do to get the best results out of such materials as are available. Manufacturers will try, not only to keep abreast of the times, but to anticipate changes as far ahead as possible, so as to be ready to help you solve your problems as they arise.

As previously stated you are going to have to rely on those who built your equipment, BUT you need have no reluctance to call on them for help, for the intention is not only to welcome inquiries but to actually solicit your problems.

That's One of the Things You Know

There was once a boy who always bragged that he and his father knew everything. Whenever given a question which he couldn't answer he said that it was one of the things his father knew.

Likewise, if these anxious-to-serve manufacturers know some of the things which only you know, they will be able to more intelligently solve your problems.

The ordinary request for help which comes from a projectionist is so lacking in information that the manufacturer invariably is unable to analyze the trouble without requesting further data, all of which requires precious time.

Accordingly, always DETAIL in your own words the difficulties you are having. The importance of TELLING ALL cannot be overemphasized. Also, send the manufacturer defective

parts, old tubes, carbon stubs, etc. His experience makes it possible to detect many troubles with this evidence at hand.

The make, type and serial numbers of all equipment are particularly important because from his records the engineer can determine the peculiarities of that particular piece of apparatus.

There are many combinations of circumstances, such as discoloration on the screen, sparking brushes, burned out transformers, and losing the arc, which difficulties may emanate from remote sources. If the manufacturer is going to be able to help you he must have an all-over picture of your equipment from the power supply to the design and make of the screen.

The real source of trouble may be so far removed from the apparent reason and visual effect that no engineer could be reasonably expected to diagnose the trouble without full knowledge of the case.

Let's take a typical case: an exhibitor writes a rectifier manufacturer that the rectifier tubes which he has been using all had extremely short life. He wants the manufacturer to replace them because "they must have been defective." For several years he had been getting highly satisfactory service from the same kind of tubes.

It was only after making a detailed investigation of the case that the manufacturer learned that the exhibitor recently had been pulling 40 amperes, instead of the customary 50 amperes. That the tube life should have been extended instead of shortened by this change was the contention of the theatre man and to say that he was "peeved" because he was now getting only a few hundred hours service out of the tubes, would be putting it mildly.

Let's see what really happened. There has been a change made in the characteristics of the carbons he was using. Because of a shortage of copper it became necessary to put a thinner layer on the carbons. And the government requested that arc amperage be reduced, as a power conservation move. This request was in reality unnecessary since arc amperage would have had to be reduced anyway in order to prevent spindling of this new carbon when burning in the arc. The exhibitor was glad to comply so he turned down his rectifier output from 50 to 40 amperes.

The designer of the rectifiers which were in use had arranged for an adjustment over a range of from 50 to 65 amperes, a common range under normal conditions. But the exhibitor had turned the arc amperage to 40 amperes, which resulted in totally new conditions of operation. Since the filament voltage of the rectifier ordinarily varies up and down as the arc amperage is changed, at 40 amperes the filament voltage was correspondingly reduced to a point where there was no longer sufficient voltage in the filament to supply the necessary stream of electrons to carry the current between the positive and negative elements, since at this lower voltage the electron supply on the surface of the filament is not replenished fast enough, and in a few hundred hours of operation the tube failed to rectify.

Now let's take the hypothetical case of the projectionist who writes the manufacturer that he can't understand why all of a sudden and for no apparent reason there has developed a severe flicker on the screen. All he tells in his report is that the equipment has been operating perfectly for 10 years; that in trying to correct the trouble he had put new tubes in the rectifier and that the flicker was gone, but that in a few hundred hours it was back again. New tubes again were resorted to and again the trouble was corrected. But the

cost of this correction in tubes was terrific. He KNOWS he's been getting inferior rectifier tubes, and he wants them replaced.

Obviously, there was no more reason for that exhibitor to have free replacement of tubes, than that an automobile manufacturer replace a car after the owner had tried substituting water for oil in the crankcase. He, too, had been trying to operate at 40 amperes, equipment designed for 50-65 amperes. Neither piece of equipment had been operated in the manner prescribed by the manufacturer. (Furthermore, note the fact that the exhibitor failed to realize the importance of a condition which seemed to have so obscure a bearing on the trouble. He even failed to mention that he had reduced his arc amperage, for, to him, that could not possibly have affected the tubes. Had he mentioned this point originally it would have sooner solved his problems and would have saved him money and an imaginary grievance.)

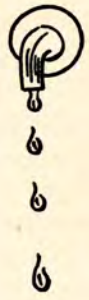
Theatre equipment field service men have learned years ago that it is the simple trouble which predominates. Checking thousands of reports it is soon evident that most problems are easily solved if all the facts are at hand.

Applied to generators, which will be inclined to act up at either higher or lower voltages than those for which they were designed, the manufacturers will be in a better position to advise as to correcting operating difficulties under newly required conditions of lower current, if serial numbers of the equipment are sent with the query.

Arc controls are designed to advance the carbons as they are consumed and this feeding rate is based on the minute electrical changes which occur in the arc when burning. The introduction of new variables is certain to upset the electrical balance of the control so that erratic feeding and unstable burning of the arc are the result. This will be noted by the arc gap length getting longer or shorter and in a continual change in focus. In turn, this invariably

results in discoloration in light on the screen, excessive burning rate of the carbons or loss of the arc entirely.

"Little Drops Of Water"



The conservation of carbons and power by the simple method of reducing arc amperage is to be commended but is apt to create too many difficulties of surprising origin. For instance, projectionists who have been burning Suprex-type carbons and find it necessary to cut the current down to the lowest recommended limit, immediately get into trouble through the formation of a brown bead on the negative end of the carbon. This is commonly called a carbide tip.

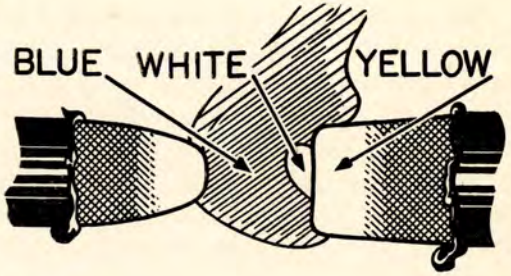
Since this bead of carbide is a good electrical insulator it causes considerable annoyance by making it impossible to strike the arc. However, this carbide tip can be easily removed by simply touching the end of the carbon with a drop of water or touching with a finger moistened with saliva just before striking the arc.

As an insulator, this bead obstructs the flow of the arc stream which will wander around to the edge of this bead rather than to flow directly from the tip of the carbon. This causes the ammeter to fluctuate radically and results in considerable unstability of the arc and some discoloration at the screen. To correct this trouble, use Oratip C carbons instead of the regular Suprex negative, or slightly increase the current to a place where this carbide trouble disappears.

"Things You Do When You Know Better"

That you are complying with the government's request to conserve carbons and current, is no valid reason for doing a slipshod job of projection. Discoloration at the screen, the result of operating arc lamps at currents less than those for which they were

designed, can be an unnecessary annoyance. A bright picture and clear field are still possible if you will take certain necessary precautions.



The cause of this discoloration may be more easily understood if you will refer to the picture on this page. Notice the dazzling white light source of the tiny gas flame just at the tip of the positive carbon. This is in reality a flame fed by a flow of gas generated in the carbons, and capable of holding its stable position only so long as the flow of current remains constant. If the current is reduced too far there will be insufficient heat at the arc to generate a steady flow of gas. Puffs of gas will come only periodically and destroy the white gas ball entirely or seriously alter its position. But as long as this flame is maintained constant, flickerless, and at focal point you will have a white light on the screen.

Examining the picture again, you will observe a blue area or arc stream just ahead of the snow-white gas ball. Also note the comparatively yellow color of the incandescent carbon itself.

If for some reason the white gas ball is lost, it can no longer be picked up by the mirror. Instead, the yellow of the carbon itself will be reflected to the screen. Again, as the white gas ball starts its return to the end of the carbon, some of the blue of the arc stream is drawn into focal range, with the screen turning blue at this point. The effect is a continuous cycle of color at the screen, from white, through yellow, into a blue and back to white again.

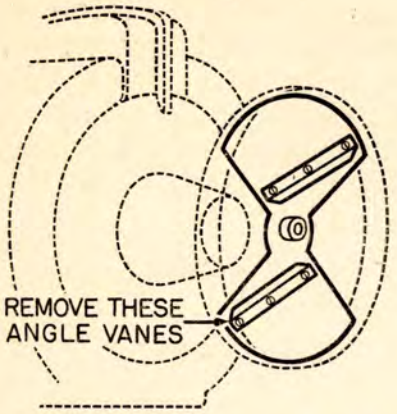
The two chief contributing factors to this aggravated condition are too low amperage and excessive draft through the lamphouse. Any draft at all will have a tendency to blow this tiny layer of gas away from its position at the tip of the carbon. Accordingly, stack ventilation and air disturbances from rear shutters must be reduced to a place where the tail flame of the arc burns absolutely steady.

Suprex arcs burning at slightly less than rated capacity invariably become a source of much annoyance, which is easily corrected, *when the projectionist realizes that it is possible to have so much trouble developing from a so apparently insignificant source.*

Periodic inspection by theatre equipment field engineers furnishes definite proof that air disturbances which result in unstable burning of the arc, exist, to the annoyance of projectionists in most every theatre in the United States. Their reports furthermore show that most projectionists are reluctant to believe that their troubles can be corrected by simple means. It is all too common a habit of projectionists to blame equipment and look for something "really big" that is wrong. This statement will be accepted in good grace when it is appreciated that this book has been prepared to help . . . to serve and not to sell anything!

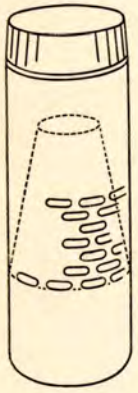
Real havoc can be caused by the air disturbance from the cooling fins on the back surface of rear shutters. It blows back through the lamphouse light cone at such a velocity as to greatly disturb a normal high intensity or Suprex-type arc burning at low current density, already susceptible to any unnatural conditions.

In the larger lamps, where the cooling effect of this draft is essential to keep the projector cool, it will be necessary to put Pyrex glass air deflectors over the opening of the rear shutter to prevent the air blowing back into the lamphouse. On one-kilowatt or Suprex-type lamps, however, it is only necessary to remove these

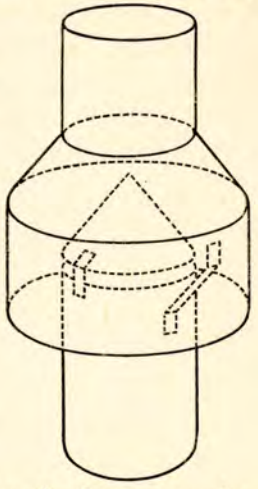


cooling fins to completely eliminate the air disturbance, as with this type of lamp the fins are not needed to cool, since the aperture heat is actually less than with the old low intensity lamp which operated quite satisfactorily without the rear shutter.

In many of the larger, better equipped theatres a separate power-driven exhaust fan, permanently connected to the flue or smokestack of the lamp with the intention of more effectively carrying off the fumes and black soot from the arc, results in so much draft that the arc cannot possibly burn steadily except with very erratic feeding of the carbons, and continuous color change on the screen.



Usually there is about ten times as much air being pulled through the lamphouse as is necessary to remove the fumes. The remedy, of course, becomes obvious. One need only slow down the speed of the motor. If it is a one-speed motor, a speed regulator should be installed. But in either event a back-draft hood (illustrated in accompanying sketch) should be installed in the stack.



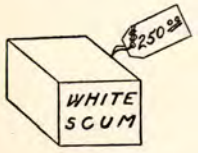
Your tinsmith can make one of these back-draft controls quickly and at little cost, or it is suggested that you buy one such as are made by leading projection arc lamp manufacturers, and made avaliable through theatre equipment supply dealers.

These corrective measures usually are all that are necessary, however, it is further recommended that the stack damper be partly closed.

In any event the draft must be so reduced that the tail flame of the arc remains as steady when the fan is running as it is when the fan is stopped, with just enough ventilation to the lamphouse to carry off the fumes and soot from the arc. *Few projectionists realize the importance of taking these corrective steps before attributing their troubles to other sources.*

"Cleaning Your Reflectors Is A Patriotic Duty!"

We've been hearing so much lately about keeping equipment clean that the admonition carries little weight. But let's take the case of the reflector.



Has it ever occured to you that the thin coating of white scum which accumulates on the surface of a reflector in a Suprex-type lamp can cut down the light as much as 25% ? Well, it can, and does! Now, how important is this 25% light loss? The annual cost of current and carbons in the average theatre amounts to about $1,000.00. Therefore, this white scum costs $250.00 a year. Today such a loss cannot be overlooked. In fact, it is the patriotic duty of every projectionist to stop this waste.

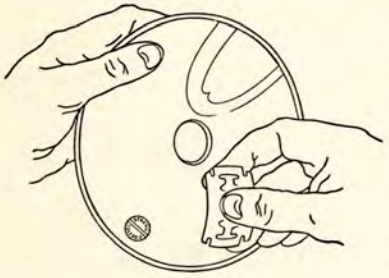
The surface of a reflector can always be kept as bright as the day you installed the lamps by means of DAILY cleaning, and by cleaning we don't mean just wiping off the surface. It means the use of Bon Ami and ELBOW GREASE! . . . EVERY DAY!

This doesn't mean that periodic replacement of reflectors is entirely avoided, for over a period of time all reflectors gradually deteriorate to a state where the cost of replacement becomes insignificant since a drop of only 10% in the reflective efficiency of your mirror results in a corresponding decrease in screen brilliancy and represents a loss amounting to 10% of the cost of your current and carbons.

Since the only light which can reach the screen must be reflected by the mirror, the loss in screen light is in direct proportion to the loss in efficiency. Light losses through the use of reflectors which have been allowed to deteriorate, and amounting to several hundred dollars a year, are not unusual. Endeavoring to make up this light loss through the use of more current similarly represents a pure waste in the form of unwarranted power bills.

There will always be some pitting of the mirrors in any lamp using high intensity or Suprex-type carbons, but this pitting is not as detrimental, nor does it cut the light on the screen down, as much as you might believe. It is the white scum which must be removed to avoid the light loss.

The main detrimental effect of the pitting is that the surface of the reflector becomes so rough that it makes polishing difficult, the polishing cloth or felt catching on the larger particles which adhere to the glass.



Removing particles from the glass is easily accomplished by scraping with a razor blade as shown in the sketch. An old Gillette blade is best for this purpose because it is flexible and can be bent between the thumb and fingers to the approximate curvature of the reflector. The blade can be slipped across the surface without scratching and the carbon particles literally fly off the glass ahead of the blade. This operation need be done only about once a month and makes the regular daily cleaning with Bon Ami much easier.

Furthermore, clean reflectors do not pit as readily nor as fast as do dirty mirrors, since the flying particles ordinarily do not adhere to the clean mirror. A short arc gap length also pits the reflectors quicker than the arc of normal length, which varies from about ¼" at 40 amperes to 5/16" at 50-60 amperes.

When You're Up That Creek . . .
Emergency Setups

For the time being, projectionists must come to the realization that when in equipment trouble they can no longer simply step to a telephone and expect an equipment dealer to rush over with replacement parts or "loaners."

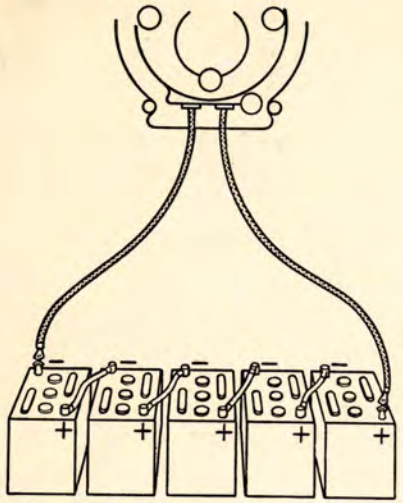
In the first place, because of conditions, few dealers will be in a position to make immediate or regular contacts with theatres. Furthermore, their supply of emergency replacement equipment will be working overtime. However, you may rest assured that they will do their level best to help you out of your troubles and may be able to make suggestions which will assist you temporarily, and help you keep running. Remember that your call for help is but one of many and your dealer is experienced in solving run-of-mine difficulties. But don't expect the impossible.

So it behooves every projectionist to take the best possible care of his present equipment. It's the only way to protect his job. Furthermore it is wise to anticipate certain troubles and be prepared for them.

The emergency set-ups which we suggest, are general. This is necessary because so many makes and models of equipment are in use, and all possess different characteristics. They may not solve your difficulties, but they're worth trying, as they may help you keep a picture on the screen.

Rectifier Failure

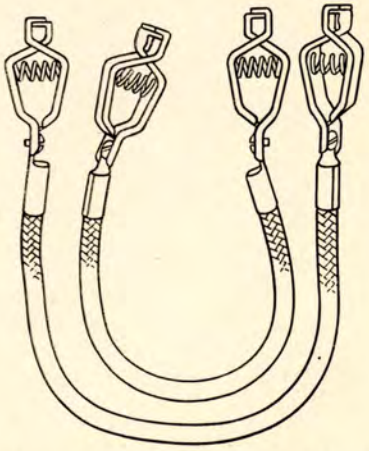
In case of individual rectifier failures, an emergency power supply can be provided by using storage batteries as shown in the accompanying sketch.



Five batteries are connected in series, as shown, for a 40 ampere one-kilowatt lamp, six batteries for a Suprex-type lamp at 45 amperes, or seven batteries for a Suprex-type arc at 50 amperes.

These fully charged storage batteries can generally be obtained on short notice from any automobile battery service station.

The regular Ford type 100 ampere hour battery, if fully charged, should run a 50 ampere arc two hours. Since one projection arc runs only half the time that should be sufficient to keep the show going an entire evening, and then all the batteries can be charged the next day in readiness for the next evening performance, continuing this procedure until the damaged rectifier can be repaired.



Emergency interconnecting leads, made up of storage battery connector clips and pieces of heavy flexible wire, as shown, should be made up and kept in the projection room, so that if one rectifier should fail, both arcs can be jumpered together at the knife blades at the lamphouse table switch.

Battery connectors and heavy flexible wire can be procured from your local automobile bat-

tery service station, and the cords made up just long enough to reach from one lamphouse table switch to the other, allowing slack enough so that the loop will reach the floor to permit the projectionist acess to both projectors.

By means of these jumpers, both arcs can be run off the one rectifier until the breakdown can be repaired. Of course, it will be necessary to "steal" the arc, which prevents a perfect changeover, but allows the show to go on without much annoyance to the patrons.

Before the emergency arises the emergency hook up should be tried out to see that the projectionist understands how to make the connection and how to "steal" the arc.

When two lamps are operated continuously from one rectifier, the net result is 100% overload on that rectifier, and accordingly this overloaded rectifier should be watched carefully to see that it does not burn itself up from the overload. If the rectifier appears to be overheating, as indicated by smoke or the smell of burning insulation, it should be immediately and continuously cooled by turning a blast of an ordinary house fan up through the rectifier and past the transformer.

Rectifiers are built for intermittent or alternate duty, that is, one rectifier operates for 20 minutes and is then shut down for 20 minutes which gives it a chance to cool off before the load is turned on again. When both lamps are on one rectifier, the load is continuous and allows for no rest, or cooling off period. It is this condition which results in the 100% overload.

Avoid this Carbon Saver "Bug"

Many theatres will use carbon savers during the emergency so as to permit the burning of the carbon stubs as short as possible. Make sure that these savers are manufactured of brass instead of steel, since steel carbon savers, when fed close to the arc interfere with the delicate magnetic balance surrounding the arc, causing the arc to become very unstable.

In designing arc lamps, especially the Suprex type, a great deal of study is given by the manufacturer to the strength and direction of the magnetic fields surrounding the arc so that it will burn steady and without color change at the screen. When a foreign piece of steel is moved into this magnetic field, this carefully worked out balance is upset or disturbed with consequent unstable burning of the arc.

It is furthermore suggested that you compile a list of the names, addresses and telephone numbers (both business and home) of all those men connected with the manufacture and service of all the theatre equipment you possess, so that in emergency you can call someone and be reasonably certain of getting the information needed, if it is possible for them to furnish it without personally being on the scene of the trouble.

Before phoning, however, have handy all the information which you are advised to furnish when writing a manufacturer (see page 21).

For your convenience we are reserving some space herewith in which to enter the names and telephone numbers which you should secure prior to an emergency. *Don't hesitate to call any manufacturer or equipment dealer at any hour of the day or night. They're all glad to help do their part in keeping a light on the screens of America's theatres.*

PROJECTION ARC LAMPS — RECTIFIERS — REFLECTORS —

	Telephone
The Strong Electric Corporation (Factory) 2501 Lagrange St., Toledo, Ohio,	GArfield 3091
The Strong Electric Corporation (Residence)	
Harry H. Strong	ADams 9044
Harold Brown	LAwndale 0814
Harold Plumadore	WAlbridge 2969
Arthur J. Hatch	KIngswood 3653

	Telephone
PROJECTOR MANUFACTURER	
INTERNATIONAL PROJ. CORP. N.Y.	
GENERATOR MANUFACTURER	
HERTNER.	
SOUND SERVICE ENGINEER L.L. LEIDY	RA. 3600
ELECTRIC POWER CO.	
COLUMBUS MUNICIPAL LIGHT	
AUTOMOBILE BATTERY SERVICE STATION	
RADIO SERVICE STORES	
THEATRE SUPPLY DEALERS	
AMER. THEATRE EQUIP CO.	MA 3894
LOCAL 386	
UNION HEADQUARTERS BOB GREER PRES.	AP. 4754
R.E. STONEBURNER. BUS. REP.	
THEATRE ELECTRICIAN	
SAVERIO VENTOLA	
NEARBY THEATRES WESTMONT	
RIVOLI	
AVONDALE	
DIXIE	

General Information To Have At Hand Before Writing Or Telephoning Equipment Manufacturer.

Make of Lamp PEERLESS MAGNARC

Serial Number of Lamp—No. (1) 2007 No. (2) 2006

Make of Rectifier _____, D.C. Amps ___, D.C. Volts ___

Serial Number of Rectifier No. 1 _____ No. 2 _____

Make of Generator HERTNER D.C. Amps 50-100, D.C. Volts 45

Serial Number of Generator 10631

Make of Projector SIMPLEX Model STANDARD

Type of Shutter (Front ☐ Rear ☒ Double ☐ Barrel ☐)

Make of Projection Lens BAUSCH & LOMB Type SUPER PAROS

Size 2 IN Focal Length 4.25

Width of Projected Picture 22 FT

A.C. Line Volts (*as actually read with a meter*) 118

A. C. Line Supply Phase (1-2-3) SINGLE & THREE

Arc Amperes (As Read With Meter) 50

Arc Gap Length (Measured to Nearest 1/64 inch) 5/16

Type of Negative Carbon ORO TIP, Size 6 mm.

Type of Positive Carbon SUPEREX, Size 7 mm.

Batch Number of Negative Carbon 70, Positive Carbon 364
(The Batch Number is stamped on each carbon.)

When writing the factory give all of the above information in addition to a detailed description of your difficulty, and send samples of carbons or tubes which are giving trouble.

Civilian Defense

The crying need for the publication of a handbook on civilian defense as it applies particularly to theatre operation has prompted the inclusion of the following material in The Theatreman's Wartime Guide. We trust that it will fill a void and assist in the job which must be done so quickly.

The material included has been gathered from those cities throughout the country where organizations first tackled the job of making theatres safe places of refuge in wartime. Recommendations varied according to the vulnerability of the particular situation. The following digest is a good cross-sectional picture of what is being done nationally. The suggestions doubtless will be subject to constant revision. If warranted, future editions of this handbook will be issued and these revisions included.

Furthermore, it is the opinion of those close to civilian defense work that all precautionary measures will be subject to the interpretation of the individual theatre manager, as each one is faced with different conditions. Obviously, these instructions are to be superseded by any orders issued by properly delegated governmental authorities.

Why Every Theatre Must Be Made A Safe Refuge

It can be anticipated that there are going to be blackouts from time to time in every city. Every theatre must be prepared to comply with all of the requirements of these emergencies.

It is to the advantage of every manager to take every step possible to make his theatre a safe refuge and then to let it be known to the public that all precautions have been taken to protect them. Patrons will be more satisfied, less nervous and more inclined to abide by instructions when the blackout comes, knowing that they are in the care of trained men who are capable of looking after their safety . . . and more inclined to patronize theatres regularly.

Although no building is declared safe against a direct hit, the fact that there will be thousands of people in or near theatres at the time of air raids makes it especially essential that all managers make their theatres unusually safe.

There is no particular reason why children should not attend regular performances, but there may be a danger in having children's matinees, whereby an air raid warning might cause panic among them.

It is advisable that close watch be kept over people bringing in packages, so as to prevent sabotage or the act of creating panic.

Training The Staff

All theatre staffs, especially the executives, should make definite plans for handling audiences in the event of panics. The problems are the responsibility of every manager today.

Every theatre owner should appoint one member of the staff to be head air raid warden of the theatre. One or more deputies shall also be appointed so that at all times one responsible individual shall be in charge. The entire staff also should be trained in its duties in the event of an air raid.

A man must be assigned to be always on the alert to listen for an air raid warning, and to proceed to a signal which will notify the manager, the stage, the booth and other strategic parts of the theatre that the warning has been given and to be on the alert for orders from the manager.

It is absolutely imperative that the manager or assistant be on duty every minute the house is open, to assume responsibility of handling the audience in the event of an air raid warning or an air raid itself.

Regular watches should also be maintained around-the-clock, with all employees sharing the duty, since it must be realized that the theatre itself — from a physical standpoint — is in as much danger when it is closed, as when open. Therefore it is necessary to have the night crews trained in fire prevention work, including the operation of stirrup pumps.

It is very important also, to have at least one member of the staff on duty at all times with training in first aid, and to whose care all casualties be referred. The importance of this is understood when it is realized that many people are inclined to do the wrong thing when they see a wounded person. It is suggested that those delegated to this work attend the first aid classes which are being conducted by the American Red Cross.

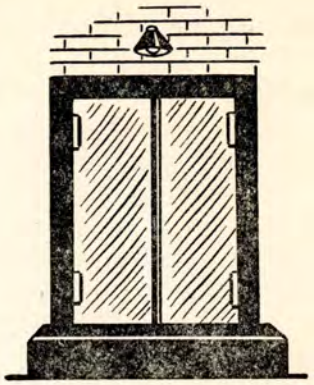
Since one of the great dangers of this war has been the incendiary bomb and resultant fires, it is extremely important to have as many attendants as possible trained in fire prevention work.

The Lighting System

The theatre lighting system should be examined to make certain that:

1—All exterior lighting can be immediately and simply extinguished in the event of a public alarm or the command for a blackout.

2—That no interior lighting shall emit any light outside the theatre. Interior lighting may thus be kept burning during an air-raid. To effect this objective, skylights and windows may have to be covered so that no light shall be emitted.



3—All exterior exit lights are shielded so that they can be kept on to the last, while steps at exits should be painted white or striped with luminous paint, to afford safey in event the exits must be used in darkness.

4—Switches are placed near the front of the house so that lighting of the front can be extinguished completely and quickly at an alarm.

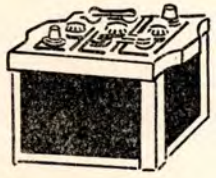
5—All switches are painted white or with luminous paint and then plainly tagged, with special marking on those which are to be thrown first in case of blackout orders.

6—Fixtures on separate circuits in the lobby are lamped in blue, and may be used when air raids are prevalent, and all the whites have been killed. A good supply of blue lamps should be kept on hand for this purpose.

Proper Lights May Avert Panic

During this emergency every theatre must be equipped with some sort of an emergency lighting system.

An efficient equipment can be assembled by the house or neighborhood electrician by using one or more ordinary sealed beam auto headlight lamps, an electrical relay which automatically turns on the emergency light when the electric power fails, and storage batteries which are always kept charged by a rectifier of trickle charger type.



These emergency systems are being supplied by theatre equipment supply dealers in a substantial box which should be mounted on the wall just outside the projection room, with the sealed beam headlamp adjusted so that the rays strike

the projection screen. With a 100-ampere hour battery system these lamps will burn for several hours, providing a surprising amount of illumination.

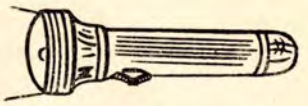
The size of the house naturally will determine the number of lights required. Theatres with balconies should have several, making sure that stairs, especially are lighted. *But be sure to point the rays of the lights* DOWN *the stairs and not up.*

Care should be taken when installing such a system so that the A. C. power supply lines are connected to an electric circuit which is always energized such as at the power panel ahead of the switches in the projection room, so that no unauthorized persons can cut the circuit dead and prevent the batteries being kept at full charge.

The projectionist should have specific instructions to make weekly tests to see that the system is working properly, and to check the batteries for charge and water level at least once a month.

Some theatres are fortunate in having installed permanent emergency lighting systems. The trouble in these cases, however, is that usually they have been forgotten and neglected, because they were used so infrequently. These theatres should immediately appoint some competent and responsible person to completely check up on the operation of this system and the condition of the batteries. If none of the employees are familiar with the system nor have the necessary meters and tools for this work, it is suggested that your nearest automobile battery service station be given in-

structions to keep the system in proper condition. It might be disastrous to find that an expensive and elaborate emergency system failed at the crucial moment simply because the batteries had not been sufficiently charged or didn't have sufficient water to keep them in condition.



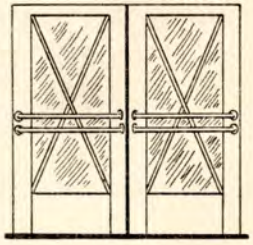
If you have not already done so, it is recommended that you supply every employee with a good hand flashlight and keep on hand a sufficient stock of batteries, as well as candles and safety matches which can be substituted if necessary.

Preparing For The Expected

Install the most comprehensive inter-communicating system possible, arranging for messenger contacts in case house phones are impracticable.

It is extremely important to sandbag completely, all projection booths located on the roofs of the buildings. This will not only protect the operators, but also the projection equipment which must be kept running even during air-raids.

All glass in doors and windows should have strips of gummed paper tape pasted from corner to corner to prevent shattering in event a bomb is dropped nearby. This tape is available in widths of one inch and up at most office supply and paper houses.



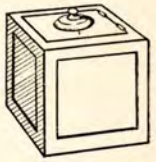
In the event skylights are over the audience, there should be some wire protection in these skylights, even though the glass has been treated with tape for fragmentation.

Chandeliers and hanging ornaments also should be secured. Wire nets can be spread under large electrical fixtures, to prevent

glass or parts from falling on the audience, in the event of great concussions from a large bomb. Or it is advisable to remove chandeliers and large glass fittings for the duration.

Flashlights for ushers and cashiers should be checked frequently and at least two spares each kept in the manager's office and not removed except for emergency.

Provide a radio for the manager's office for receiving "all clear" instructions and other information.

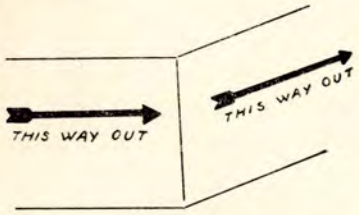


Install a small safe in the boxoffice, where cashiers can toss their change in case they have to evacuate.

Remove all inflammable and accumulated useless materials so as to minimize fire hazards.

Keep all courts and fire escapes clear of snow and ice.

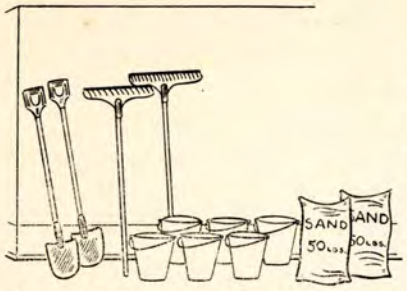
Theatres with complicated passageways leading to exits should paint arrows with luminous paint or some indicating device, making it comparatively simple for people to find their way out of the theatre if the emergency arises. Luminous paper, which glows in the dark, also is being made available for the production of direction signs.



Purchase a complete supply of first aid equipment.

Have at least six pails, two long handle shovels with blunt points, and two rakes, all of which should be painted red, and two fifty-pound bags of DRY FINE SAND stored in the lobby or near the exit to the roof. This equipment is for getting incendiary bombs into the street where they can burn themselves out.

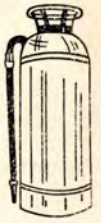
Buckets of sand also should be available at all important points.



The recommendation has come from London theatre managers that where practical, all top floors be treated with a layer of sand three inches thick so that incendiary bombs will not penetrate the roof, and will burn themselves out without causing any damage. Local building inspectors doubtless should be consulted as to the advisability of taking this precaution, and to determine whether the roof structure will carry this additional load.

Fire-Fighting Equipment

Check your fire-fighting appliances. The fire department will aid you if you call them for this assistance. The following facts regarding fire extinguishers are worth knowing:



Acid Soda Type

1. Extinguishers of this type should be charged once each year and there should be attached a tag, bearing the date of last recharging.

2. They should be checked at least once a month to see that they are in place and have not been tampered with.

3. Examine nozzle to be certain it is not stopped up with soda. This happens very often and if the nozzle is stopped up the extinguisher becomes useless and may be dangerous due to possibility of explosion. If you want to test the extinguisher to be certain it is in operating condition, take off the top and let out the soda bottle and drop one or two drops of soda into the extinguisher. A sharp snappy chemical reaction should result.

4. CAUTION. If it becomes absolutely necessary to use soda

acid extinguishers on magnesium bombs, it must be remembered that great caution will have to be taken, the point being that if the stream is squirted onto the bomb, it will cause explosive action. The stream might be applied on any fire around the bomb but if it is to be used on the bomb itself, your finger must be held over the nozzle to create a spray. This is easier to say than to do as there is considerable pressure on these extinguishers. If it is not possible to create a spray, these extinguishers should only be used on the fires caused by the bombs rather than on the bombs themselves. It should be remembered that it normally takes about three of these extinguishers to cope with a single bomb.

Carbon Tetra Chloride or Hand-Pump Type:

1. These extinguishers are very likely to be stolen, and also to be found empty, as the liquid in them evaporates readily and is often taken for cleaning clothes. The only way of testing them is to pump their contents into a glass container and then replace the contents in the extinguisher, observing whether the extinguisher works when you pump it.

2. It is not necessary to re-charge these extinguishers—they should merely be kept filled.

3. These extinguishers SHOULD NOT be used ON A MAGNESIUM BOMB as this will form PHOSGENE which is a POISONOUS GAS and would PROBABLY BE FATAL if inhaled in sufficient quantity.

Sand Pails:

These should be kept filled at all times with dry sand and it is advisable to have a scoop in the pail for spreading sand. Sand is useful in extinguishing magnesium, oil, paint, fuel oil, or gasoline fires — particularly in soaking up these liquids if spilled. They are useful around oil burning fires or furnaces.

Foam Extinguishers:

These are similar in operation to the acid-soda type and should be re-charged yearly in accordance with directions.

Stirrup pumps should be placed in all strategic positions, as determined by the manager and a member of the fire department, with two buckets for each pump, both full of water at all times.

When The Raids Come

Theatre managers should be familiar with the local air-raid warning system.

Employees should notify the management immediately in the event he hears of a disturbance, an air raid or otherwise.

When a fireman is stationed at the theatre he is usually in supreme command. If there is no fireman present, take orders from a policeman.

Night superintendents should notify the manager, treasurer and all department heads in the event of an emergency after the theatre is closed.

In an emergency, the front doorman should have charge of the lobby and see that all doors are closed by himself and the porters. He should advise against anyone leaving the theatre. He should also be on the alert for the "all-clear" signal.

When on duty the box-office staff should make sure that all exterior lights are extinguished, these to include signs, marquee, fire

escape and lobby lights. When the staff is off duty at night, this should be the manager's responsibility.

Normal interior lighting should be kept on.

The show must go on under any circumstances, unless otherwise ordered by the management.

What To Tell The Audience

If there is an air-raid, announcement of same should be given only by the manager or the responsible head on duty at the time. In no case should an employee take it upon himself to give any alarm.

The theatre management must take means to see that their patrons are quietly, but effectively given notice by personal announcement from the stage and NOT THROUGH A PUBLIC ADDRESS SYSTEM. House lights should always be raised before any announcements are made. With the stage lights or spot light on, the manager or his assistant should walk on the stage and tell the audience that an air raid warning has just been sounded but that this is no assurance there will be a raid. He asks that everyone remain seated and tells the audience that the management intends to continue the performance, and that while no one will be held in the theatre against their will, that it is much safer to remain inside of the theatre than to be on the streets, and that the authorities have requested that they follow these instructions. (The purpose of keeping people inside the theatre in the event of an air raid, is to prevent them from being hit by shrapnel.) He also tells them that when the "all-clear" is sounded he will advise them. The personal appearance of the individual on the stage gives the audience the assurance that the staff is remaining and not running for shelter.

After making the announcement, the management shall see to it that the performance proceeds in its normal way.

Smoke — Deadheads — Crowds — Music

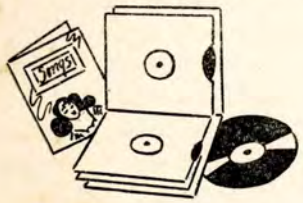
Ushers should take posts so that patrons can see them, so as to give them confidence and assurance.

If there is an outside fire and smoke can enter the fresh air ducts, the intake fan should be closed and the ventilating plant stopped as soon as the fire is discovered. There is always a possibility that a nearby fire might be started by incendiary bombs and the fans suck in smoke which would be conducive to a panic.

In the event of a public alarm, admit persons seeking shelter without regard to admission charge.

Don't send people into the streets in the event of a raid. Any building is better than no building.

Efforts should be made to prevent over-crowding of theatres. It is dangerous to allow people to stand in the aisles or at the exits, or to crowd too many into the standing places in the back of the orchestra or balcony, if hostilities become serious.



Standby music should be arranged for use in case the power supply fails when it is advisable to keep the audience inside. Appoint one of the staff to lead in community singing if this must be resorted to in order to prevent an audience from becoming restless.

"Where Was Moses When The Lights Went Out?"

If he's a projectionist or theatre manager he'd better not be in the cellar eating sauerkraut during these days of threatened raids,

blackouts, and possible power failures. Too much valuable and irreplaceable equipment is at stake.

If there is a power failure during a performance, someone with electrical knowledge, preferably the projectionist, should turn off all electrical power, motors, lights and sound systems, so that when the power comes on again it won't throw a sudden load on the supply lines and blow fuses or burn up equipment.

How To Handle Incendiaries — The "All-Clear"

If it becomes necessary to clear the house, ushers should open specified exit doors, depending on their posts, and then return to direct patrons. The manager should announce, "because of a disturbance in the neighborhood we have been requested to clear the theatre. Please use the nearest exit. The ushers will direct you." Music, whether band, organ or records, should be played after this announcement.

If an incendiary bomb lands on, or near the theatre don't try to put it out with an ordinary stream or bucket of water, since such procedure would result in an explosion. Fire-extinguishers furthermore are of no avail. A garden hose, adjusted to give a spray, will reduce to about two-thirds the burning time, and prevent its spreading. The ideal way to handle an incendiary is to smother with sand, and is preferable to water in any form. Sand should be poured on the bomb, and then, as soon as the heat permits, attempt to transfer it, with a rake or shovel, to the street or a metal container partially filled with sand. It will continue to burn even when covered with sand, since it creates its own oxygen. If a bomb happens to be on a wooden floor, it will burn itself through and drop to the floor beneath.

After a raid, keep everyone indoors and await important instructions which should come over the radio. When the "all-clear" comes, the manager will once more go on the stage with the same routine as used on the first announcement, telling the audience that the "all-clear" has been sounded.

What A Blackout Is

It is of two types; one, the automatic blackout that always goes into effect during an air raid. The second type is the "strategic" or "precautionary" blackout which may be ordered any time, to remain for any length of time, by the U. S. Army Interceptor Command.

Any blackout is the extinction of all lights, or illumination of objects, which could be seen by enemy aircraft. This means that no "naked" light, nor any reflected light, nor any illuminated object, shall be visible from above. Shaded lights of very low candlepower, whose beams are not directed upon any reflecting surface, may and should be used after they have been tested and approved as being invisible from above.

When it occurs:

The orders for a strategic blackout originate with the United States Army Interceptor Command. The automatic blackout follows upon the giving of the appropriate air-raid warning signals that again originate with the United States Army Interceptor Command. In threatened areas a "strategic" blackout might continue for weeks—with no air-raid warning.

Illuminated cities can be seen for many miles, as all persons who have traveled by plane at night can testify. Bearing this in mind, it is obvious that much of the effectiveness of the blackout is dependent upon the speed with which it may be executed.

The time interval between the sounding of an air-raid alarm and the actual time of the dropping of bombs may be very short. The organization responsible for detecting approach of enemy planes has been carefully staffed, and trained by the United States Army; even so, no definite period can be guaranteed before hostile planes arrive overhead after the warning has been given.

Bombs

Upon its explosion, a high explosive bomb is immediately destroyed, but frequently causes fires which must be attacked in the customary manner. In the case of an incendiary bomb, however, the incendiary material of which it is composed is not immediately consumed after the bomb is ignited. This material continues to burn for one to twenty minutes, or even longer, depending upon the size and composition of the bomb. So intense is the heat generated that unless a bomb which has penetrated a building is promptly extinguished or removed it may quickly burn through one floor and drop to the floor below, thereby spreading the fire. Hence, it frequently is of first importance to deal with the bomb itself, leaving the burning area about it to be attended to later. However, the proper procedure for dealing directly with an incendiary bomb is somewhat different from that which applies generally in fire fighting. This procedure varies according to the particular kind of bomb encountered. For example, the usually proper course of deluging a dangerous blaze with water might be a serious mistake in dealing with certain kinds of incendiary bombs. One must know how to identify the different types and understand the specific methods of fire fighting indicated in each case. A fire caused by an incendiary bomb is no different from a fire due to a more common cause, and is dealt with in the same manner as any other fire. It is only in dealing with the bomb itself that special precautions are necessary.

Incendiary Materials

Intensive Type

The intensive type of incendiary material is that which is held together as it burns. The intense heat of the burning material is thus concentrated so that the material's immediate incendiary effect is confined to a small area. This class of incendiary substances includes two different types.

One of these types consists of the thermits, which are mixtures of powdered aluminum and iron oxide, sometimes containing small quantities of other ingredients. The thermit mixture, when ignited, reacts chemically to form a mass of molten iron which, in turn, acts as an incendiary in igniting flammable material with which it is brought in contact. The chemical reaction by which the molten iron is produced takes place rapidly and with considerable violence. It does not depend on a supply of oxygen from the air. However, any incendiary action of the molten iron will depend upon a supply of oxygen from the air.

The second type of incendiary material, commonly called "electron" bombs, is represented by a magnesium alloy case containing an igniting core of thermit that is ignited by a "first fire" mixture such as aluminum powder, barium nitrate, and black powder. The magnesium alloy case is ignited by a relatively small charge of the ignition mixture and the case itself then melts and burns with a very high temperature until consumed. Magnesium alloy, to burn, must be supplied with oxygen from the air or surrounding material. A considerable percentage of the electron bombs contain a small explosive charge which is added primarily to discourage fire fighters from approaching the burning bombs. The action of this explosive charge is delayed, but if there has been no explosion 2 minutes after the bomb lands, it is probably safe to remove the bomb with a long-handled shovel.

Scatter Type

The scatter type of incendiary material is that which is dispersed, usually by an explosive charge, so that small fragments of the burning material are scattered about and thus may cause fires to break out simultaneously in a number of places.

The most generally used and generally effective scatter type incendiary material is white phosphorus, which burns spontaneously on exposure to the air producing an

intense white smoke. It thus lends itself to use in munitions containing an explosive charge sufficient to rupture the container and disperse burning pellets of phosphorus over a considerable area. The burning phosphorus particle, when it lands, may set fire to easily combustible material. Phosphorus will not set fire to heavy planks or heavy wooden construction. Due to the intense white smoke produced, phosphorus bombs are more likely to produce a panic than fire, and thus prove a demoralizing agent rather than an incendiary.

Another scatter type of incendiary is solid oil to which there may be added finely divided metallic sodium or potassium or sodium hydrate. The purpose of the latter ingredients is to rekindle the fire in case the oil comes in contact with water, either at the hand of a fireman or by other means.

Liquid flammable oils are also included in this general class. The violence of their burning may be increased by diluting with gasoline, turpentine or other highly flammable liquids which are mutually soluble with the oil. Such incendiary material, on burning, produces tremendous heat. However, the relatively large volume or bulk of such liquids in comparison to their weight militates against their use in small bombs.

Squares of cardboard or other combustible material containing a small amount of phosphorus at the centers, called "incendiary leaves," have been scattered promiscuously in great numbers from airplanes. The "incendiary leaves" are kept wet until after they are scattered, whereupon they burst into flame as they become dry. The incendiary squares are particularly likely to set fire to dry woods, or combustible roofs.

Incendiary Bombs

Intensive type

The so-called "electron bomb" has been used extensively in Europe. This is a magnesium alloy bomb, consisting of a cylindrical case 2 inches in diameter and 9 inches long, made of magnesium alloy and containing a charge of readily ignited powder. Metal fins are provided on one end to steady the bomb in flight and to cause it to strike on its nose. Upon impact, an ignition device inside the bomb is actuated, thus firing the starting mixture, which burns with sufficient heat to ignite the casing. The bomb weighs about 2½ pounds and will burn for 15 to 20 minutes.

The thermit bomb is composed of a thin, noninflammable case filled with thermit that is ignited by a "first fire" mixture. Such bombs are made in sizes ranging from perhaps 10 to 132 pounds and are fired either with a firing pin on impact or with a time fuse so set as to ignite at a predetermined time after release.

Scatter Type

White phosphorus bombs are composed of a charge of white phosphorus and a burster charge in a thin steel container. When exploded the white phosphorus is showered in small particles over an area of 50 to 100 square yards, depending upon the size of the bomb. The particles of white phosphorus ignite upon contact with the air and will be burning shortly after leaving the shell. As incendiary agents the particles are very limited, igniting only dry and flimsy materials. The greater danger from white phosphorus bombs is in the possible contact of particles with the human body, in which case they produce serious burns. When white phosphorus burns it produces an intense white smoke. The smoke is harmless, though it may produce mild throat irritation and coughing. Because of its appearance and the throat irritation the use of white phosphorus bombs might be demoralizing to unsuspecting and

unknowing civilians and cause panic. Because of the smoke produced by the burning, phosphorus particles may be easily located, and should be allowed to burn out if possible. If extinguishment is required it may be done by the use of water, but it must be remembered that the burning will be resumed as soon as the particles become dry.

Magnesium Bombs

The intense heat of a burning magnesium alloy bomb will tend to prevent approaching it closely. To do so would be especially dangerous for the first minute or so after the bomb starts to burn, since the starting mixture sputters, throwing out a mass of sparks for some distance and also a certain percent contain a small explosive charge which has a delayed action. A table or chair can be used as a shield while applying a water spray on a burning incendiary bomb.

The fire fighter must decide in each case whether to deal first with the fire or the bomb itself. If the fire has already gained considerable headway, it will be necessary to get it under control at once. On the other hand, if it has not progressed appreciably, the bomb itself should receive first attention.

If there is considerable smoke, the fire fighter should keep his head as close to the floor as possible. To avoid heavy breathing, he should operate with as little physical exertion as possible.

Ten gallons or more of water should be available to deal with the bomb alone. The stream from the nozzle should be used on the burning structure and the area about the bomb, but a solid stream should not be directed upon the bomb itself. Solid streams striking a bomb cause an explosion and disperse the molten metal. For treatment of the bomb with water the nozzle should be adjusted to throw a moderately coarse spray. It should be understood that water cannot be expected to extinguish the bomb but causes it to burn faster and more intensely. The value of water is that it causes the bomb to be consumed and thus gotten rid of in a fraction of the time which it would otherwise take for it to burn out. A spray which will put water on a bomb at a distance of not less than 12 to 15 feet is the most effective. In no case should a bucket of water ever be thrown upon a bomb of this type. Copper sulphate solution is particularly well suited for dealing with white phosphorus bombs, and may be used in lieu of water on other types.

Dry sand or even earth may be used to reduce the supply of oxygen so that the bomb burns less violently. The amount of heat given off is reduced, and the dazzling glare of the burning metal is stopped. It should be realized, however, that the bomb thus covered is not put out and will burn through the floor in a few minutes unless removed. Using a long-handled shovel or specially designed long-handled scoop with detachable hoe the bomb may be raked into a coal scuttle, bucket or similar receptacle. A 4-inch layer of sand or similar material should first be placed in the receptacle, otherwise the bomb may burn through the bottom of the vessel before it can be carried out. The vessel should be carried on the end of the shovel or a pole.

Fire extinguishers employing a water base, such as the soda-acid or foam type are effective. Carbon dioxide and carbon tetrachloride extinguishers have by test been found ineffective on these bombs, but will put out fire resulting from the bomb action.

TYPE OF INCENDIARY	SIZE	COMPOSITION	METHOD OF EXTINGUISHING
Small "Electron" bombs	1 Kilogram (2.2 pounds)	Cylinder of combustible magnesium alloy containing thermit mixture to ignite the magnesium alloy. May contain an explosive charge.	Spray (not a stream) of water. Cover with sand. Remove with long-handled shovel to a metal container with layer of sand in bottom.
Medium and large "Electron" bombs	2-25 kilogram (4.5 to 55 pounds)	Same as above. All large incendiary bombs will contain some explosive.	Same general methods as above but experienced fire fighters are required to handle largest bombs of this type.
Thermit bombs	15 kilogram (33 pounds) 50 kilogram (132 pounds)	Noninflammable case containing mixture of iron oxide and aluminum (thermit) ignited by a "first fire" charge that is ignited either by impact or fuse. May contain explosive charge.	Burning thermit cannot be extinguished. Molten iron produced may be cooled to reduce spread of fire.
White phosphorus bombs	30 pound (may be of any size)	White phosphorus with an explosive charge to ignite and scatter the phosphorus upon impact.	Water will extinguish burning phosphorus. Copper sulphate solution, if available, is even more effective. Remove all fragments to a safe place and burn. Avoid handling the fragments with bare hands.
Multiple effect bombs	12 kilogram (26.5 pounds)	Separate incendiary units of phosphorus and magnesium alloy which scatter upon impact and ignition.	The burning magnesium units can be handled in the same manner as the electron bombs. Burning phosphorus can be extinguished with water and then should be removed to a safe place while wet.
Oil bombs	Large drums	Fuel oil or solidified gasoline. May contain other combustible substances. Scattered and ignited by a black powder burster charge upon impact.	Smother with sand.
"Incendiary leaves"	Approximately 4 x 4 inch squares	Moist squares of cardboard or nitrocellulose coated with phosphorus which ignite as they become dry.	Immerse in water or copper sulphate solution. Burn in some safe place. Be sure that all are collected as one unrecovered square may cause a serious fire.

CITIZENS' DEFENSE CORPS

The team of trained civilian services organized to operate the passive defense is known as the Citizens' Defense Corps. It includes regular forces of the city—police, firemen, welfare workers, sanitation men—as well as volunteers. It operates as a unit under the local Defense Coordinator.

Staff

The Citizens' Defense Corps is headed by a Commander assisted by a staff. His second in command is the Executive Officer. There are others who operate the control center and the communications, account for personnel and property and assign transportation. The Chiefs of the Fire and Police Departments assist him in the passive defense. There is a Chief Air Raid Warden, a Chief of Emergency Medical Services, and others who control groups of the enrolled volunteers. Learn the organization of the Citizens' Defense Corps in your community.

Enrolled Volunteer Services of The Citizens' Defense Corps

Air Raid Wardens are in complete charge of a sector containing the homes of about 500 people. To them the warden is the embodiment of all Civilian Defense.

Auxiliary Firemen assist the regular fire-fighting forces.

Auxiliary Policemen assist the police department in enforcing blackout restrictions, in traffic control, and in guard duties.

Bomb Squads are specially trained squads of police to handle and dispose of time bombs and duds.

Rescue Squads are trained crews of about 10 men each with special equipment to rescue the injured from debris.

Medical Forces consist of first-aid parties and stretcher squads and personnel at casualty clearing stations. Members of these forces are doctors, trained nurses, and assistants.

Nurses' Aides assist nurses. They have special Red Cross Training.

Emergency Food and Housing Corps members provide welfare services to the needy and homeless.

Drivers Units consist of emergency drivers of vehicles used by the Civilian Defense services.

Messengers carry supplies, dispatches, and messages wherever needed.

Road Repair Crews restore normal flow of traffic as quickly as possible. Utility repair men work with these crews and with demolition squads.

Demolition and Clearance Crews remove rubble, fill bomb craters, and remove unsafe walls or parts of buildings.

Decontamination squad members are specially trained to treat clothing and equipment as well as streets and walls contaminated by war gas.

Fire Watchers must spot and combat incendiary bombs.

Practical First Aid

By Bertha Henderson*

First — What To Do And Not To Do

First Aid is the temporary and immediate treatment of injuries and sudden illness until the arrival of a physician. In case of disaster an individual should have knowledge and ability to render first aid and tactfully take control of the situation.

General directions for giving First Aid:

1. Keep the victim lying down with the head level.
2. Examine victim for injuries if not clearly seen. Look for hemorrhage, wounds, burns, fractures and dislocations.
3. Remove enough clothing to get a clear idea of the extent of the injury.
4. Keep the patient warm. This is essential in preventing serious shock.
5. Do not move injured person unless absolutely necessary until the nature and extent of the injury is obtained.
6. Call a physician. Give definite information.
7. Make the patient comfortable and allay his fears.
8. Keep onlookers away from the injured. They frequently interfere with what is being done.
9. Be sure nothing is done that will cause further injury to the patient.
10. Procure proper transportation.

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Wounds

A wound is a break in the skin or in the mucous membrane lining one of the body cavities.

Wounds may be divided into four kinds:

1. Abrasions: Made by rubbing or scraping off the skin or mucous membrane. These are very easily infected.
2. Incised: These are made by any sharp cutting instrument, a knife or broken glass. They tend to bleed freely. Very little tissue around the cut is destroyed and they are not so liable to infection as other kinds of wounds.
3. Lacerated or torn: Injuries by blunt instruments, or a piece of exploding shell. The danger of infection is greater in this type of wound due to dirt being ground into the tissues, to lack of bleeding and to destruction of body tissues forming the edges of the wound.
4. Punctured: These may be caused by any penetrating instrument. These wounds do not bleed freely unless a large blood vessel is injured. They are difficult to clean out and often become infected. It is difficult to apply an antiseptic well down into the wound. Lack of air favors the growth of certain germs, particularly the one causing tetanus or lockjaw. This germ grows only where oxygen or air is not present. Encourage bleeding in punctured wounds being careful not to bruise the tissues, and then working iodine well down into the wound. The value of giving tetanus antitoxin in these cases cannot be overemphasized.

If it is impossible to secure a physician's services at once, applications of hot salt solution can be used. Use boiled water, add about three heaping tablespoons of ordinary salt to each quart of water. Use as hot as comfortable and apply compresses wrung out of the solution. Change often enough to keep hot. A clean bath towel makes a good compress.

Care Of Wounds

1. Do not touch the wound with the hands or any soiled material.

2. Do not wash with soap and water. You will carry in germs from the surrounding skin. If a physician's services are available leave all cleaning of the wound to him. If not, rubbing alcohol is the most suitable preparation for removing dirt. Use clean gauze or cotton and wash away from the edge of the wound, never toward the wound.

Apply mild tincture of iodine (2%) well down into the wound and on the skin around the wound. Let the iodine dry. If wrapped up while still wet, blistering is likely to occur. Apply a sterile dressing and bandage. This prevents dirt and germs from entering the wound.

Wounds With Severe Bleeding

In all serious bleeding, think first of pressure. One should not put fingers into a wound. If a compress is not available, do not hesitate to apply pressure directly on the bleeding point. (Fig. 1. Pressure Points.)

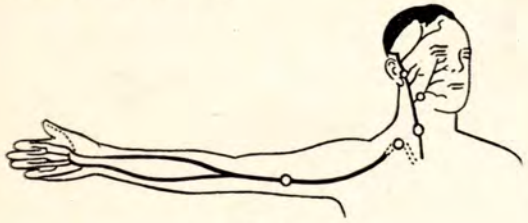

Fig. 1.

Fig. 2.

Arterial bleeding—Blood from a cut artery comes in spurts. Immediately apply hand pressure between the cut and the heart. For bleeding from arteries in the temple region apply pressure just in front of the ear. (Fig. 2.) For bleeding from wounds of the face below the level of the eye apply pressure along the jaw bone. (Fig. 3.) For bleeding from a cut throat, place the ends of

the fingers against the side of the windpipe (not over it) and carry the thumb on around the back of the neck applying pressure between the ends of the fingers and the thumb. (Fig. 4.)

Fig. 3.

Fig. 4.

For bleeding from the extreme upper part of arm, the armpit or shoulder, apply pressure in the hollow behind the inner third of the collar bone down against the first rib. (Fig. 5.)

Fig. 5.

Fig. 6.

For bleeding in the hand, forearm, and the upper arm, grasp the arm about half way between the shoulder and the elbow, fingers on the inside of the arm and thumb to the outside. Apply pressure from the fingers to the thumb. (Fig. 6.)

For bleeding in the thigh, leg or foot, apply pressure in the middle of the groin with the heel of the hand. (Fig. 7.)

Fig. 7.

Fig. 8.

If hand pressure is difficult to keep up and bleeding is from one of the limbs the tourniquet should be applied next.

A tourniquet should be a flat band at least one inch in width—never a rope, wire or sash cord. A triangular bandage folded to form a narrow cravat is excellent but a belt, handkerchief or something similar will do. (Fig. 8.)

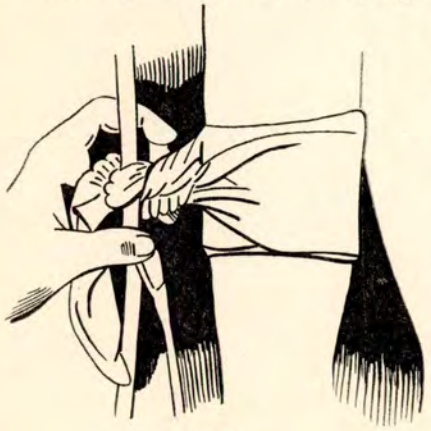

Fig. 9.

The tourniquet is preferably used with a pad over the artery, or it may be used as a constricting band around the arm or thigh, without the pad if no pad is available.

In either case wrap the material twice around the limb if at all possible and tie a half knot. Place a short stick or similar article on the half knot and tie a square knot over it. Twist the stick rapidly to tighten the tourniquet, thereby pressing on

the artery and stopping the flow of blood. Do not tighten more than necessary. (Fig. 9.)

A tourniquet should not be used if the bleeding can be readily checked otherwise.

Venous Bleeding

Bleeding from veins comes in a steady stream and is under much lower pressure than from an artery. It is much easier to control. Always elevate the bleeding part except in case of a fractured limb. Apply pressure with the fingers along the edge of the wound, particularly on the edge away from the heart.

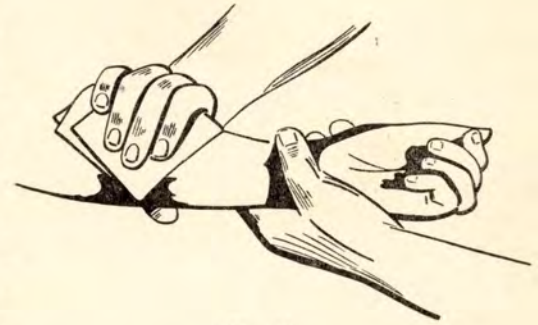

Fig. 10.

Usually bleeding from a vein can be controlled by placing a compress over the wound and bandaging snugly. (Fig. 10.)

Shock is present in all cases of serious bleeding. It should always receive prompt attention as soon as the bleeding is controlled.

Shock

Shock is a condition in which all the activities of the body are greatly depressed.

Shock results from a stagnation of blood chiefly in the blood vessels of the abdomen. This results from the "insult" to the nervous system, causing the nerves to lose control over the blood vessels. The blood vessels relax and the blood pressure is lowered. The pressure becomes so low that the blood does not flow back to

the heart fast enough to supply a sufficient amount to fill the pump each time it pumps. This accounts for the weak pulse.

Causes:

Injury
Bleeding
Pain
Fright

Prevention:

Shock may not be prevented in all cases but its severity may often be reduced. The same measures are used to prevent shock as are used to treat it. They are: Heat; Position; and Stimulants.

Symptoms:

1. The face is pale—lips, ears and finger nails are often blue.
2. Listlessness.
3. Cold perspiration—forehead and palms of hand.
4. Weak and rapid pulse.
5. Severe chill.
6. Restlessness.
7. Nausea and vomiting.
8. Irregular breathing.
9. Mental sluggishness.

Treatment:

1. Heat
2. Position
3. Stimulants.

Immediate treatment is vital and may save a life.

Heat:

A person suffering from shock loses heat rapidly due to the poor circulation of the blood. Keeping the body of the patient warm is the most important thing both in treating and preventing shock. Wrap the patient underneath as well as on top to prevent further loss of body heat. Apply external heat whenever possible, guarding against burns.

Position:

Lay the patient on his back with the head low and elevate the feet, legs and thighs if possible.

Do not use a pillow under the head of a person in shock.

Stimulants:

Aromatic spirits of ammonia, teaspoonful, well diluted, is one of the most satisfactory stimulants. This may be repeated every thirty minutes as needed.

Hot coffee and tea both contain the drug caffein, which is an excellent stimulant. Give as hot as can be comfortably taken. The heat is of much value in combating shock.

Hot milk or even hot water has some stimulating effect due to its heat.

Avoid the use of alcohol.

Avoid stimulants until bleeding is controlled.

Avoid stimulants in head injury cases.

Do not attempt to make an unconscious person drink. Use an inhalation stimulant such as an ammonia ampule, aromatic spirits of ammonia on a handkerchief, or smelling salts placed near the patient's nose. In shock cases there is definite need of a physician.

Fractures

A fracture is a broken bone.

Kinds:

1. Simple.

In a simple fracture the bone is broken but there is no connecting wound from the break in the bone to the skin.

2. Compound.

In a compound fracture the bone is broken and in addition there is a wound from the break to the surface of the skin.

General Symptoms:

1. Simple fracture.

a. Pain
b. Tenderness
c. Deformity
d. Loss or limiting of movement
e. Swelling
f. Discoloration
g. Grating

2. Compound fractures

All of the above symptoms, plus the following:

a. A wound from the break to the surface.
b. Protruding of bones.
c. Frequently severe bleeding.

Care of Simple Fractures:

1. Prevent further damage.

Improper handling may cause the sharp ends of the bone to

injure the nerves and muscles, cut through blood vessels, or even pierce the skin thus producing a compound fracture.

2. Make the patient comfortable.

3. Treat shock that may be present.

Do not attempt to set a broken bone.
Do not apply a splint unless patient is to be moved.
Do not move patient until a splint has been applied.

Care of Compound Fractures:

Use same treatment as for simple fractures, plus

1. Control of bleeding if present.
2. Care of the wound.

Physician's services in all simple and compound fractures.

Splints:

An improvised splint may be made with a board about 4 inches wide and ½ inch thick.

Splints can be made from many rigid materials. Often pillows and blankets can be used as splints for forearm or lower leg. The splint should be long enough to extend beyond the joint above and below the fractured bone. Ample width is desirable; boards used as splints should be as wide as the limb, if possible. They should always be well padded to fit the limb.

Unconsciousness

Unconsciousness may be defined as a condition present when no response can be obtained from the patient. Mumbling replies are obtained if the loss of consciousness is partial. Unconsciousness may be caused from a head injury such as a skull fracture and concussion. Also from a "stroke." A doctor should be called in every case.

Lay patient on his back, keep him quiet and warm. Use great care in moving patient and keep him in a lying position.

Fainting

An emotional shock brought on by fright, or a close or crowded room may cause a patient to faint.

Symptoms:

Face pale.
Perspiration appears on forehead.
Dizziness.
Weak and slow pulse.
Patient slumps and falls to floor.

Fainting can be prevented if the patient lies down.

If a patient is in a sitting position and feels he is about to faint, he should bend forward at the waist and put the head between the knees.

Treatment:

Keep the patient lying flat and if possible lower the head.
Loosen tight clothing.
Apply smelling salts to the nose.
Wash the face with cold water.
Keep quiet until recovered.
If patient does not respond to treatment call a doctor.

Heart Failure

Heart attacks occur frequently. They may be divided into groups such as those cases having pain in the region of the heart, cases having shortness of breath, and cases resembling fainting. Those patients having pain or resembling fainting should be kept lying flat and quiet. If the patient has difficulty in breathing he must be propped up, or he may have to sit up straight. A stimulant of aromatic spirits of ammonia, tea, or coffee may be given. Fear is always present and every effort should be made to keep the patient as quiet as possible so there is no extra strain on the heart. Reassure the patient and call a physician.

War Gases

Gases are substances used in chemical warfare. They may be in the form of vapor, liquids or solids, and are contained in bombs, shells and grenades, which are freed after explosion. They affect the body by being breathed in as fumes, or by being sprayed on as droplets or very fine particles. Persons coming in contact with contaminated objects, such as ground, plants, bushes or skin and clothing of other persons who have been contaminated with gas may be seriously affected. Irritation of the eyes, nose and throat, burns and blisters of the skin, damage of the lungs, is often caused by the chemicals used.

The separation of gassed individuals in separate gas stations is essential for the proper care and treatment of the patient and also to prevent danger to other injured persons.

Protection from gas is based chiefly on the use of gas masks and gas proof shelters.

Types of Gas:

Tear gases affect the eyes, causing burning pain, tearing and spasm of the lids. Do not rub the eyes or bandage them. Remove from the contaminated air. Face the wind and avoid any crowding. Tear gas has an odor like fly paper or like apple blossoms.

Sneeze gases or nose irritants resembling coal smoke in odor cause aching pain in the head, face, nose, throat and chest, sneezing and coughing. Partial paralysis of one or more limbs, vomiting and mental depression may be present. The effects are severe but temporary. Try to avoid panic. Flush nose and throat with weak solution of baking soda and if vomiting is present drink baking soda solution freely.

Choking or lung damaging gases may have a sweetish odor, or may smell like new cut hay or mouldy hay. The odor is very disagreeable. It causes coughing, soreness in the lungs, headache and has a brassy taste. The effect of this gas is serious. Keep patient lying down and move on a stretcher. Keep patient warm. Hot tea or coffee may be given.

Blister gases known as Lewisite with the odor of geraniums and mustard gas with the odor of garlic or horse radish, cause burning of the eyes, itching, burning and blistering of the skin. If breathed into the lungs severe pain in chest and a brassy cough results; if swallowed it produces nausea and pain. First aid must be immediate. After washing with running water and soap daub (do not rub) washed skin with cloths moistened in alcohol, ether or gasoline (*not ethyl*). If eyes are affected, flush with cold water, weak solutions of boric acid or baking soda. Contaminated clothing should be removed for protection of patient and attendant.

Paralyzing gases, smelling like bitter almond or rotten eggs, cause headache, unconsciousness, convulsions and may cause stoppage of breathing.

Patient should be removed to fresh air and given first aid treatment such as described for unconsciousness.

Screening smoke, with the odor of matches, is harmless except when phosphorus strikes the skin causing deep burns. Phosphorus must be removed. If hot water is available immerse the wound and sponge out with gauze pad; with cold water, particles must be picked out under water as exposure to air will reignite the phosphorus. Treat like ordinary burns.

Burns

Burns are injuries caused by the contact of heat and are classified according to the degree or depth to which the tissues are injured.

First degree—skin is reddened.

Second degree—skin is blistered.

Third degree—destruction of tissue as cooking or charring.

When a person's clothes are on fire, smother the fire with coats, blankets or rugs, smothering from the shoulders toward the feet.

Pain is more severe in burns than in any other kind of injury. If burns are extensive, shock is severe.

Care of first, second and third degree burns:

1. Remove all loose clothing over the burned area. Do not remove clothing that sticks to the skin. (Apply treatment over material.)

2. Apply several layers of sterile gauze soaked in a warm baking soda solution, made by adding two or three heaping tablespoonfuls of baking soda to a quart of boiled water. Any clean water will do in an emergency. Bandage gauze in place and cover patient with a blanket to keep warm.

—or—

3. Epsom salts may be similarly used.

—or—

4. Picric acid gauze.

Moisten the sterile picric acid gauze with clean warm water, apply several layers and bandage.

—or—

5. Tannic acid jelly 5%.

Spread the jelly on sterile gauze and bandage in place.

Never apply iodine to a burn.

Do not us cotton directly on a burn.

Do not open blisters. They should be opened only by a doctor.

Medical aid should be summoned immediately. A physician's services are always needed.

Give the usual care for shock.

Transportation

The importance of proper transportation for an injured person cannot be over estimated. Improper or careless methods frequently increase the severity of the injury. Do not be hurried into moving an injured person. Very few cases need break neck speed.

The kind of transportation should be suited to the character of the complaint. In general a stretcher is the proper means of carrying all persons suffering from an injury or illness. Move the patient in a lying position, except in rare cases where it is necessary to prop him up so that he can breathe.

The army stretcher is the most satisfactory if available. An improvised stretcher may be made with two poles and a blanket or strong sheet. Place one pole on each long edge and roll toward the middle till the desired width is reached; tie securely in place.

A very satisfactory stretcher can be made by placing the patient in the center of a blanket and rolling the edges to him. This requires two and preferably three bearers on each side.

A convenient method of carrying a person without a stretcher, is to seat the patient on a strong chair and have two bearers lift the chair. This method is valuable in carrying a patient up or down stairs, particularly where a stretcher cannot be used.

First Aid Kit

The kit must be large enough and have the proper contents for the location where it is to be used.

The contents must be arranged so that the desired package can be quickly found without unpacking the entire contents of the kit.

Material must be wrapped so that unused portion does not become dirty through handling.

The contents of each package should be clearly indicated on the top side in legible type.

All liquids such as tincture of iodine and aromatic spirits of ammonia are usually kept satisfactorily if rubber stoppers are used and the bottles kept tightly corked.

Contents of kit:

1-inch compresses on adhesive in individual packages.

Sterile gauze squares 3″ x 3″ in individual packages.

Triangular bandages (made from 36″ 38″ or 40″ unbleached muslin).

Picric acid gauze.

Burn ointment—such as 5% tannic acid jelly.

Iodine, mild 2%.

Aromatic spirits of ammonia.

Scissors.

Forceps.

Paper cups.

1 inch, 2 inch and 3 inch roller bandages.

1 roll of adhesive tape.

Sterile gauze of about 1 square yard in individual packages.

Certain other articles occasionally may be needed but in general this is all the material required.

—*Bertha Henderson.*

The Prone Pressure Method of Resuscitation

The National Safety Council, the National Electric Light Association, and the American Gas Association are endeavoring to give the widest publicity possible to the Prone Pressure Method of Resuscitation which is equally applicable to cases of apparent death from electric shock, drowning or asphyxiation from poisonous fumes.

Many persons meet death from these causes every year when a few simple measures would save their lives. The victims are seldom killed outright and need only to have their breathing restored artificially.

The Prone Pressure Method of Resuscitation is exceedingly simple, easily and quickly learned and involves the services of but one person and no mechanical apparatus.

Method:

Everything depends on quick action.

Start treatment immediately and as near the place of accident as possible, first, however, removing a gassed victim to pure air.

Lay victim on stomach—face to one side—arms over head.

Now kneel—straddling victim—well below the waist—facing toward head.

Place your hands on victim's sides—just above hips and touching lowest ribs.

With arms straight—swing forward slowly—bring your weight to bear upon the victim—gradually and heavily but not violently—for about three seconds.

Then swing back to original position, releasing your weight. It is immaterial whether or not your hands are kept on the victim's body between strokes.

Repeat operation about twelve times a minute or at rate you breathe.

All you do in these instructions when you exert pressure is to force air out of the lungs, and when you release pressure, the air flows back itself.

The victim will usually show signs of returning life within a half hour, but, if not, continue as long as two hours.

Do not move him until he is breathing normally, then use a stretcher, keeping him warm and in bed for several hours; in gas cases, the victim should be watched carefully for 24 hours to avoid relapse.

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DUTY OF EVERY THEATREMAN TO
HELP MAINTAIN PUBLIC MORALE—
TO "KEEP 'EM SHOWING"
UNDER TRYING CONDITIONS!