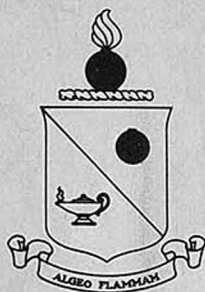


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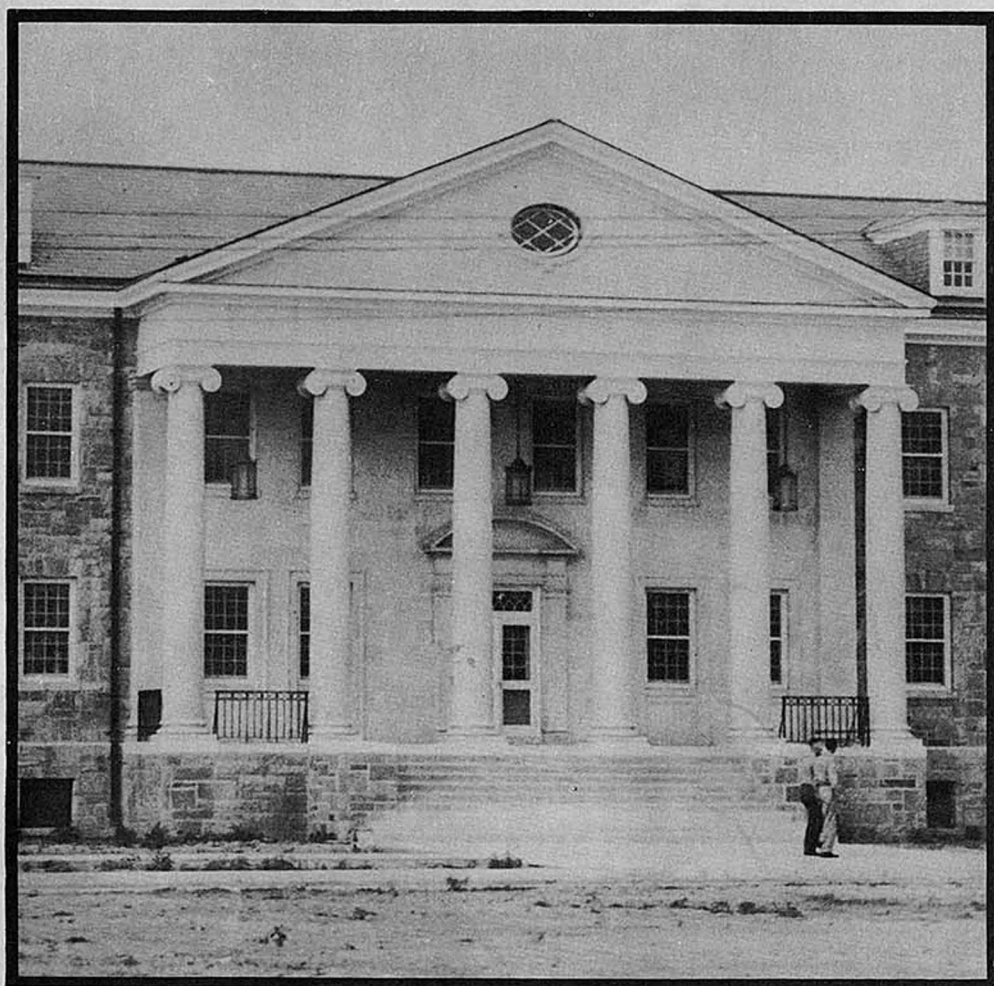
ORDNANCE SERGEANT



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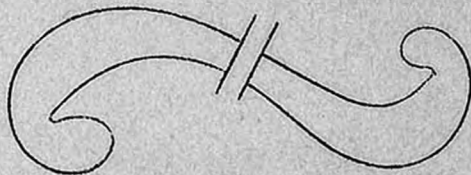
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The Cover Picture

Entrance to Administration Building, The Ordnance School

Photo by Technical Sergeant E. R. Manfrin, Ord. Dept.



EDITORIAL

"LIVES OF GREAT MEN OFT' REMIND US"--OF WHAT?



Abraham Lincoln
February 12, 1809

When a majority of 130 million Americans, both native and adopted, take the time in these hurried days to remember the birth dates of two men in one month there must be a reason. What was it that these men possessed which set them so far above uncounted millions of other Americans who have lived, and died, and been forgotten?

These men gained fame because of the positions of leadership to which they rose, of course, but other men rose to the same positions, without acquiring the same fame. They struggled, and won, against great difficulties, but that same story of struggle and success has been the life history of many a man. There must be some other factor in these two lives which set them apart from others.



George Washington
February 22, 1732

Some may say that these men lived at just the right place at just the right time; that fate was unusually kind to them. The statement is undoubtedly true, but even a hurried study of the lives of Washington and Lincoln will prove its inadequacy; and at the same time will disclose the secrets of their rise to fame, and the reasons for their places in the memories of the Nation.

Each of these men began life in what we might consider a small way of living. As they developed into manhood they undertook SMALL jobs for which they were fitted, not large jobs which might have been beyond their capabilities. Instead of seeking fame they strove for modest but none-the-less-real success in each small effort. And therein lies one of the secrets of their success.

How often does opportunity present itself to the average man? And how often does the average man, because of personal desires, often only temporary, let opportunity pass him by? How often do you and I, with selfish motives, and inexcusable lack of foresight, neglect our duty to our jobs, and to our futures? Therein lies the second secret of the lives of Washington and Lincoln. They labored at small tasks to the very limits of their abilities. When opportunity came to them they were ready, sincere in their willingness to tackle the next bigger job, confident that they could do a little more a little better.

Just as surely as Washington and Lincoln lived at the right time and place, so do you and I this very day. They lived in times of emergency and crisis, similar in their importance to those we experience today. During the present emergency there are many big jobs to be done, but not every able man can be assigned to one of them. The accomplishment of every heavy responsibility, and of every huge task, however, depends to a great extent upon the successful and efficient performance of many small duties by men who may feel themselves and their assignments quite insignificant -- possibly you or I. Our failure to perform a small task properly may mean the utter collapse of a very important and greater effort. Such opportunities to serve come very often in these days of

(Continued on page 49)

THE ORDNANCE COMPANY— MAINTENANCE, RAILWAY ARTILLERY

by
Donald D. Alexander
Captain, Ordnance Department

HISTORY

While guns mounted on railway cars were used by American Forces during the Civil War, the development of Railway Artillery did not really begin until the period of the First World War. During this time all Railway Artillery materiel was maintained by the Coast Artillery units to which it was assigned. Recent developments in this class of weapon, and the fact that the Coast Artillery is primarily a combat branch, have indicated the need for an Ordnance Unit to assist in the maintenance and repair of Railway Artillery.

DEVELOPMENT.

The development of an Ordnance Unit for Railway Artillery maintenance first began to take definite form in 1938. At that time a Table of Organization was prepared and certain methods of procedure for the operation of the company were outlined. However, no company was activated.

Further study brought out certain defects in the original organization with the result that a new Table of Organization was prepared as of November 1, 1940. This table, No. 9-47, is titled "Ordnance Company, Maintenance, Railway Artillery", and the designation of the units will be "_____ Ordnance Company (Maintenance)".

The first units to be organized as railway artillery maintenance companies will be activated in the spring of 1941. They will be given thirteen weeks of training at the Ordnance Unit Training Center and then will be sent to their stations.

FUNCTIONS.

The functions of the Ordnance Company, Maintenance, Railway Artillery, are: To repair Railway Artillery Materiel when such repairs are beyond the capabilities of the battery personnel or equipment, this includes repairs to both the artillery and the railway components of the materiel; to issue such items of general Ordnance supplies as are carried by the company; to furnish such technical advice or assistance as may be requested by the battery commander; to perform periodic inspections of all Ordnance materiel in the hands of units serviced by the company; and to arrange for the repair in the communication zone, or the zone of the interior, of any Ordnance materiel which cannot be repaired by the company.

ORGANIZATION.

The Ordnance Company, Maintenance, Railway Artillery, has a total personnel of four officers and eighty-seven enlisted men. The company is organized into a Company Headquarters and three Service Platoons. The Headquarters is composed of a Captain as company commander and 12 enlisted men. The enlisted men have

the following classifications and ratings:

- 1 - Master Sergeant, Master Mechanic
- 1 - First Sergeant
- 1 - Staff Sergeant, Unit Supply
- 1 - Sergeant, Mess Sergeant
- 1 - Corporal, Company Clerk
- 1 - Private, Specialist 5th Class, Chauffeur
- 1 - Private, Specialist 3d Class, Cook
- 1 - Private, Specialist 4th Class, Cook
- 1 - Private, Cook's Helper
- 1 - Private, Messenger
- 1 - Private, Orderly
- 1 - Private, Basic

Each Service Platoon is in charge of a First Lieutenant. The enlisted personnel comprises 25 enlisted men with the following classifications and ratings:

- 1 - Technical Sergeant, Section Chief
- 1 - Staff Sergeant, Assistant Section Chief
- 1 - Sergeant, Mechanic, General
- 1 - Corporal, Section Clerk
- 1 - Corporal, Tool Clerk
- 1 - Private, Specialist 3d Class, Airbrake Mechanic, Railway
- 1 - Private, Specialist 2d Class, Armorer
- 1 - Private, Specialist 5th Class, Chauffeur
- 2 - Privates, Specialist 6th Class, Chauffeur
- 1 - Private, Specialist 4th Class, Electrician, General
- 1 - Private, Specialist 1st Class, Instrument Repairer
- 1 - Private, Specialist 2d Class, Instrument Repairer
- 1 - Private, Specialist 2d Class, Machinist, General
- 1 - Private, Specialist 3d Class, Machinist, General
- 1 - Private, Specialist 3d Class, Mechanic, Artillery
- 1 - Private, Specialist 4th Class, Mechanic, Artillery
- 1 - Private, Specialist 4th Class, Mechanic, General
- 1 - Private, Specialist 5th Class, Mechanic, General
- 1 - Private, Specialist 4th Class, Munitions Worker.
- 1 - Private, Specialist 1st Class, Tool Maker
- 1 - Private, Specialist 3d Class, Welder, Oxyacetylene.
- 3 - Privates, Basic

Of the 67 Privates in the company, 22 may be First Class.

ASSIGNMENT

The normal assignment of the Ordnance Company, Maintenance, Railway Artillery, is to a regiment of Coast Artillery. In operation, each of the three Service Platoons of the company will be assigned to one of the three battalions of the regiment and will service all Ordnance materiel of that battalion. During such an assignment, the Ordnance Platoon will usually mess with the battalion.

EQUIPMENT

The equipment assigned to the Ordnance Company, Maintenance, Railway Artillery, comprises the following:

- 3 - Railway Machine Shop Cars, one of which is assigned to each of the
- (Continued on page 48)

The ORDNANCE VIEWPOINT

The purpose of this page is to stimulate thought among Ordnance Sergeants regarding potential Ordnance problems of the future. Read the following News Article, which has appeared in many newspapers, study the short discussion which follows it, and then -- GIVE IT A THOUGHT!

U.S. TRANSPORTS REGIMENTS BY AIR IN NEW TEST NATION'S FIGHTING FORCES PERFECT SPEED, ATTACK

by Harold Slater
International News Service Staff Correspondent

Washington, Dec. 26. -- Transportation by air of complete regiments of combat troops, including heavy machine gun and anti-tank units, is being accomplished by the United States Army in tests to perfect the speed and attack of the nation's fighting forces, the War Department revealed today.

The experiments, now being conducted at Fort Sam Houston, Texas, are designed to permit the air battalions to hold advanced posts from 24 to 36 hours, until the main ground forces of the army can be brought up. The air battalions, would be landed from the skies at points seized by parachute troops.

NEWEST AIR FORCE

The Army's newest air fighting force is being composed in units of battalions. A battalion is made up of 31 officers and 838 enlisted men. With equipment, including machine guns, anti-tank guns and ammunition, each unit weighs about 200,000 pounds, the War Department said.

The experiments reveal that it will take about 60 big transport planes to move a battalion. Greatest difficulty confronting the Army in the present tests is in moving the 37 mm. anti-tank companies by air. There are twelve anti-tank weapons in a battalion and each weighs 950 pounds. The experiments show that it takes about 13 transports to move this section of the planned air battalions.

USE CARGO PLANES

Army C-39 cargo planes, similar to some of the commercial transports are being used in the Texas tests. Stripped of all excess weight each transport is able to carry about 3,500 pounds on a long haul. In the event of actual war, it was said, the C-39's could be used to transport the anti-tank units, while regular transports could move machine gun troops and regular infantry.

DISCUSSION

by
J. E. Dempsey
Second Lieutenant, Ordnance Department

The movement of a complete unit of combat troops by air may never mean a thing to you, for you may never be involved in such a maneuver. Still, maybe you will, for some Ordnance man probably will. There is an Ordnance problem to be solved here, and you may be called upon to offer your solution.

(Continued on page 50)

GET ACQUAINTED WITH THE M1 RIFLE

by

Technical Sergeant H. L. Bagley

The article in the January issue covered general characteristics and inspection. This time we will try to add some information on the lubrication and upkeep of the rifle for both the Ordnance Sergeant and the using service.

There are a number of things that can be discussed, and various ways that the same point may be reached in service to the weapon. There is one thing to keep in mind: This rifle is something new and there will be a great number of kinks that will come to light as time goes on, so we will have to be patient and overcome these difficulties as they arise.



Conducted by
Master Sergeant C. G. Goodman

LUBRICATION

The word "lubrication", to a great many people, means the act of slapping great gobs and quantities of grease or oil on a machine. This may be suitable for the farmer to carry out on his binder or corn sheller, but it does not work on the M1 Rifle. Lubrication of the rifle is an art and should be so considered. Excessive and improper use of the lubricant furnished is the cause of a great amount of our malfunctions in the rifle, so it becomes necessary to stress this point with the line organization. In doing this, it will be found that our work will be reduced greatly and that the line will be pleased with the results.

The rifle is a machine and should be treated as such. No man will try to run a gasoline engine without the use of proper oil or grease, yet he will try to use the rifle without any regard to its lubrication and expect it to function properly. He uses graphite grease where he should use light oil, or uses light oil where he should use graphite grease. A common fault is the use of too much grease, and the outcome is the picking up of dust and dirt on this grease and rendering it unfit as a lubricant. Instead, it becomes a grinding compound and the rifle will no longer function properly.

The following points should be lubricated with graphite grease. The grease should be applied to the corner of a patch and rubbed on the following surfaces lightly.

- (a) The cam surfaces of the bolt locking lugs.
- (b) The cam on the rear of the bolt that contacts the hammer in cocking.
- (c) The bolt guides in the receiver.
- (d) The operating rod spring.
- (e) The compensating spring (in old model rifle).
- (f) The surface on the under side of the barrel at the rear, where the operating rod comes in contact with the barrel.
- (g) The groove in the right side of the receiver for the operating rod.

The use of light oil is not so restricted in the M1 rifle. Light oil is used all through the rifle on moving parts that have not already been lubricated with graphite grease.

In the bolt group, very little oil should be applied to the firing pin, extractor, extractor plunger, and spring and ejector.

The rear sight should receive very little oil, one or two drops around the aperture so as to reach the pinion, more for preservation than lubrication. An

(Continued on page 53)

ARTILLERY

Conducted by Master Sergeant W. C. Minshaw

THE MANUFACTURE OF GUN BARRELS

The gun proper consists of the tube assembly and the breech mechanism. The tube assembly consists of the tube and the various surrounding and attached parts for strengthening it and for securing it to the carriage.

The tube is the inner cylinder of the body of the gun; it contains the rifled bore. When the piece is fired, the tube is subjected to certain stresses, as follows:

1. Tangential stress, compression or tension, in a plane perpendicular to the bore in directions perpendicular to the radii of the bore.
2. Radial stress, compression in the direction of the radii of the bore.
3. Longitudinal stress, tension in the direction of the axis of the bore.

The tangential and radial stresses tend to burst the gun, the longitudinal stress tends to pull the gun apart in the direction of its length. For a given section of the gun, the longitudinal stress is substantially uniform over the entire section. Both the tangential and radial stresses, however, vary decidedly with the distance from the bore; both are much greater at the bore than at the exterior of the gun.

In early gun construction, the stresses were met simply by an adequate mass of inert metal. Only the inner layers of the metal were utilized to the limit of their strength, and the gun was heavy. Modern guns are constructed so as to utilize all the metal more completely to resist the tangential and radial stresses. The gun then is sufficiently strong to resist the longitudinal stress. This result is obtained in manufacture by placing the inner layers in a state of initial compression (either tangential or radial, whichever is greater) and the outer layers in a state of initial tension, within the limits of strength. Then the pressure of firing is absorbed first by relieving the initial compression of the inner layers and then by subjecting them to tangential tension and radial compression, again to the limit of strength. Thus the initial compression enables the inner layers, which are subjected to the greatest stress, to carry a double load (speaking generally); and stresses the outer layers also to the limit of their strength. The strength of the gun is increased greatly as a result.

According to methods used in setting up the initial stresses, guns are referred to as: Built-up, wire-wrapped, and cold-worked.

The gun is formed on the exterior so as to permit its attachment to the cradle and its being guided in recoil and counterrecoil.

The gun is of steel, either alloy or carbon.

BUILT-UP GUN. --A built-up gun is one in which the tube is reinforced, and placed under initial compression by means of hoops shrunk around it. The method of construction is as follows: The hoop is machined accurately to a diameter slightly less than that of the tube (from .001 to .0015 inch per inch of diameter); the hoop then is heated so as to expand it sufficiently, placed over the tube, and the whole is cooled. The number and arrangement of the hoops vary.

Hoops are named according to their position on the tube; as, breech hoop, muzzle hoops, and the like. Locking hoops are used to join adjacent hoops in

(Continued on page 54)

(AUTOMOTIVE)

Conducted by Master Sergeant J. W. Winslow

KEEP AN EYE ON YOUR BATTERY.

by Second Lieutenant A. L. Hettrich

The storage battery is an important accessory to the modern automotive vehicle. However, it is one that is very often neglected. Such neglect, if continued over a period of time, shortens the normal life of the battery and often may (very inconveniently at times) result in its complete failure. To prevent this, periodical checks are necessary; at least once a week in the summer, and once every two weeks in the winter. If the vehicle operates over rough terrain it may be necessary to check the battery daily. A general inspection can be made quickly but should be made thoroughly.

The frame that holds the storage battery should hold it securely. A battery that is not secure may crack, spill the electrolyte, the cables may work loose, or they may be worn by coming in contact with the frame, thus causing a short circuit. The cable connections should be thoroughly inspected. Loose-ness, corrosion, or rust greatly increase the resistance to the flow of current to and from the battery. The battery terminals should be kept clean and greased with vaseline every time the cables are connected. The top of the battery should be clean and dry. The vent holes in the caps should not be plugged with dirt. The electrolyte level should always be checked. The latter is important since continued exposure to the air causes the exposed part of the plates to harden, making it very difficult to fully charge the battery again. The level should be about $3/8$ inch above the top of the plates, and no higher, as any excess may run out through the vent holes in the caps while the vehicle is in motion. In adding the electrolyte, only distilled water should be added. When necessary to add water to the electrolyte during freezing weather, this should be done just before the battery is to be charged (just before driving the vehicle). The water will then mix with the electrolyte and not remain on top and freeze. Also, during freezing weather, the battery should be kept as fully charged as possible at all times to prevent freezing. As the battery approaches the completely discharged state, the electrolyte gradually loses the greater part of its acid content, and this gradual decrease in acid content causes a corresponding rise in the freezing point.

The greatest drain on the battery during freezing weather is in starting the motor of the vehicle. Loosening the motor by using the hand crank relieves the battery and starter of the initial load of turning over a cold motor. This measure and others that may be used, such as reduced radio and cigar lighter use, in cold weather, will aid in keeping the battery charged.

The preventive maintenance measures mentioned above will keep the battery functioning efficiently under normal operating conditions. However, if at any time there is reason to believe that internal defects exist, the battery should be tested with the proper battery testing equipment in order that these defects may be discovered and corrective measures taken at once.

Part Two

The Refraction and Reflection of Light

Conducted by
Technical Sergeant
R. L. Johnson

In the first part of this series we reviewed the theory of light and discussed briefly the phenomena of refraction. Refraction occurs when light rays strike a transparent medium, such as water, glass, air, and transparent substances in general. But not all the objects that the light rays strike are transparent. This brings us to another characteristic of light.

Suppose our light rays strike a highly polished, reflecting surface, such as a mirror. If this happens, the light rays are reflected back into the same medium from which

they came. The manner in which this occurs can better be illustrated by the use of a diagram (See Figure 5).

Let I represent a ray of light, striking a mirror, OM , at X . The line R will be the path of the reflected ray. We erect n , perpendicular to the mirror, (the dotted line), to represent our normal. The angle i , between the ray IX , and the normal, is called the angle of incidence. The angle shown by r is the angle of reflection.

The angle of incidence is always equal to the angle of reflection.

From our discussion in Part One of this series we have seen that light rays passing from a more dense medium to a less dense medium are bent away from the perpendicular. Suppose we examine another ray of light, coming from a point, O , in a tank of water (See Figure 6).

The rays of light, coming from the point O , which is under water, strike the surface at a, b, c, d and e . They are then refracted along the paths; aa', bb', dd' , and ee' , respectively. Note that as the angle increases the more the rays are bent away from the perpendicular; we will come to the ray od which is reflected along dd' , until it barely grazes the surface of the water.

The rays of light, coming from the point O , which is under water, strike the surface at a, b, c, d and e . They are then refracted along the paths; aa', bb', dd' , and ee' , respectively. Note that as the angle increases the more the rays are bent away from the perpendicular; we will come to the ray od which is reflected along dd' , until it barely grazes the surface of the water.

The angle i formed between the perpendicular and the ray od is called the critical angle.

For water and air this critical angle
(Continued on page 56)

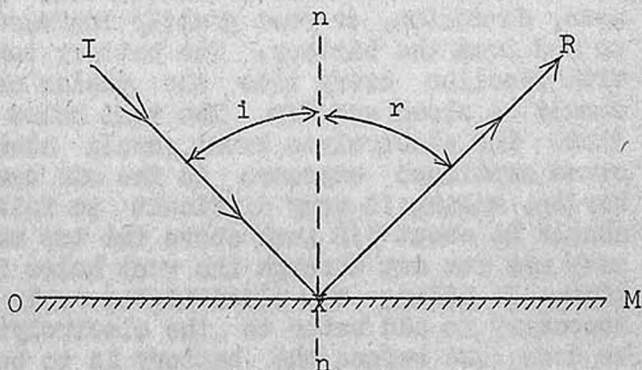


Figure 5

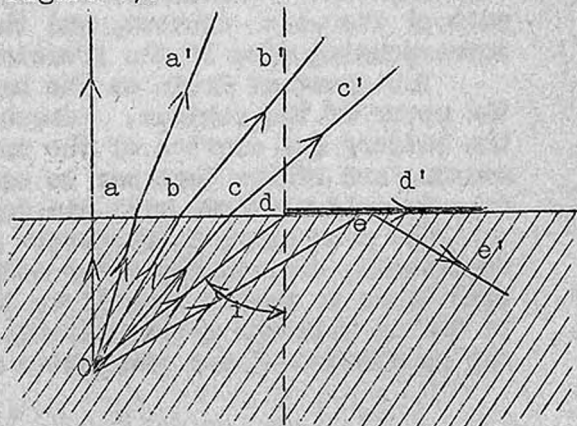


Figure 6

ADMINISTRATION

Conducted by Technical Sergeant C. K. Harper

The Administration page of the January issue of "The Ordnance Sergeant" started off with the beginning of an article dealing with the "Reorganization of the Army Personnel System". Lack of space prevented complete presentation of the subject in one issue. This second installment will, therefore, continue the article, beginning with the organization of the Administration Center.

4c. The Administration Center.

This echelon in the chain of army administration is entirely new. Administration Centers are organized and established, whenever practical consideration permits, at army corps headquarters (for Corps Troops); at headquarters of divisions; and at headquarters of posts and other installations. These echelons are composed of the several Unit Personnel Sections of the troops for which they operate. In the corps headquarters they are composed of the Unit Personnel sections of the Corps Troops; in the division, of the Unit Personnel Sections of the units comprising the division (the various regimental and other Unit Personnel Sections); and at posts and installations, the Personnel Section or Sections organized and set up to operate for the miscellaneous post and installation organizations. The personnel of each Unit Personnel Section in an Administration Center operates under its own Personnel Officer for its own unit. The various sections in the center are under the supervision of the appropriate Adjutant General (corps, division, etc.) or Adjutant (post or installation).

The purpose of establishment of these centers is as a further step in the simplification of administration, relief of unit commanders maintaining Unit Personnel Sections from the burden of routine general administration by moving the bulk of this administration still further to the rear, and to assure greater speed, flexibility and uniformity in administration. In the field the normal place of duty of Administration Centers will be at corps or division, rear echelons.

The adjutant General, or Adjutant, of the Administration Center to which the newly formed or activated unit is assigned, immediately supervises the establishment of the Unit Personnel Section for the unit and the preparation of the initial roster of the new unit which is forwarded to the Machine Record Unit serving the Administration Center. (Note: This initial roster is the only roster that is prepared as far forward as the Administration Center. Subsequent rosters are prepared by the Machine Record Units).

All reports of changes (WDAGO Form 303) prepared by Unit Personnel Sections at the Center are assembled daily by the supervising Adjutant General or Adjutant and transmitted to the Machine Record Unit, together with certification of the fact that all these reports have been submitted for the day.

The Administration Center is the point of contact between organizations and Machine Record Units and may correspond directly with these Machine Record Units on personnel accounting matters.

d. The Machine Record Unit.

In this echelon we find another new and quite different step in the administrative chain. These units, as the name implies, perform personnel accounting and administration by using machines. These machines are of the punch card type which may be found, in various forms, in use throughout the business

(Continued on page 49)



Conducted by
Technical Sergeant G. W. Akers

Property accounting in peace time runs into many complications, as well as requiring a large force of clerks to accomplish it. This task is very similar, and almost as rigid, as accounting for public funds, and why not? Property actually represents public funds, and it is necessary that they both be accounted for as well as safeguarded, and used for the purpose for which they were intended. There actually would be little need for the detailed system we have now, were all people strictly honest, and clerical errors were unheard of, but such is not the case, and consequently we have what might well be described as another necessary evil.

The principles of accounting for public property are few and simple, namely; all transactions in a property account must be supported by valid written evidence, called vouchers, accountability and responsibility must be definitely fixed from the time an item is procured either by manufacture or purchase, except in the combat zone in time of war, when accountability ceases, until it ultimately passes from the control of the Government. Care must be taken to preserve this equipment against unserviceability due to means other than fair wear and tear, or from becoming lost.

For purposes of uniformity and obtaining a standard method of accounting, there are printed numerous forms, of which the basic ones are:

(1) Requisition, W.D., Q.M.C. Form No. 400. -- This form will be used in requisitioning all Ordnance supplies.

(2) Stock Record Card, W. D., Q.M.C. Form No. 423 or 424. -- This form will be used for keeping the stock record accounts of all property received, issued, and on hand.

(3) Report of Survey, W. D., A. G. O. Form No. 15. -- This form is used to list that property requiring the action of a surveying officer or any property lost, destroyed, or damaged through means other than fair wear and tear.

(4) Statement of Charges, W. D., A. G. O. Form No. 36. -- This form is used for listing articles of equipment charged against enlisted men.

(5) Inventory and Inspection Report, W. D., A. G. O. Form No. 1 -- This form will be used to list articles worn out through fair wear and tear, and requiring the action of an inspector.

(6) Receiving Report, W. D., Q. M. C. Form No. 431. -- This form is used to account for articles purchased.

(7) Shipping Ticket, W. D., Q.M.C. Form No. 434. This form is used to cover shipments of property (partial transfer of accountability). One copy is receipted by the consignee and returned to the consignor, becoming a voucher for the consignor to drop the equipment listed thereon from stock record and a debit voucher for the consignee to pick the articles up.

(8) Over, Short and Damage Report, W. D., Q. M. C. Form No. 445. -- This form is used for effecting adjustment of discrepancies in property accountability, that occur in storage or transit, for making changes in nomenclature, and for other purposes as prescribed in property accounting regulations.

For purpose of illustration we will take up the form most commonly used as a voucher, which is the shipping ticket. This form when signed by the consignee becomes a credit voucher to the consignor's property account, and a debit voucher

(Continued on page 55)

This month, because suggestions have not as yet come in from the field, we shall continue with our discussion on foreign bombs.

German bombs, bomb fuzes, and bomb bays are among the most interesting produced by foreign powers. At the present time, the Germans are using five standard bombs in their raids upon British and pro-British countries. These five bombs are:

1. The 500 kg. (1,100 lb.) high explosive bomb.
2. The 250 kg. (550 lb.) high explosive bomb.
3. The 50 kg. (110 lb.) high explosive bomb.
4. The 10 kg. (22 lb.) fragmentation bomb.
5. The 1 kg. (approx. 2 lb., 3 oz.) incendiary bomb.

Four of these bombs are sketched out on page 62 and compared with four corresponding bombs by our Air Force.

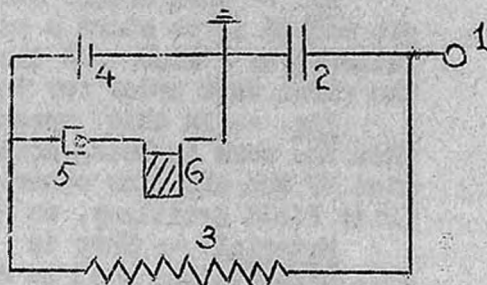
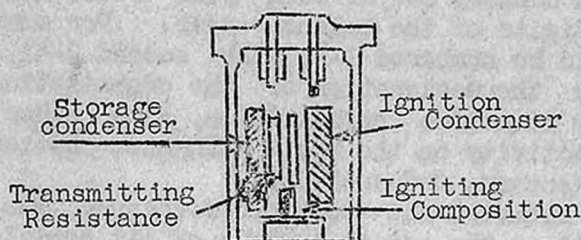
For the remainder of this month's article, I wish to present some information on the bomb fuze which is used on most of the German bombs. This fuze is known as the "Rheinmetall Electric Bomb Fuze", and it is sometimes referred to by uninformed news correspondents as a "side fuze".

This fuze is small, simple in design, and almost failure-proof in operation. In conjunction with these advantages, this fuze presents the paramount advantage of permitting the bombardier to drop the bomb or bombs either safe, with delay action, with instantaneous action, or with combinations of delay and instantaneous action.

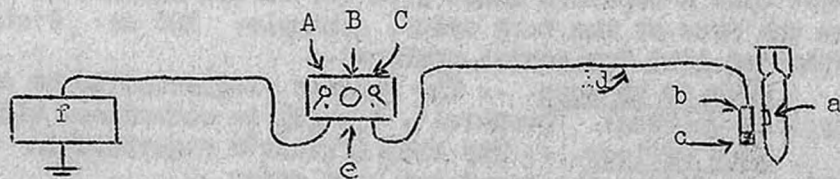
A simple line drawing of the fuze is shown below, together with a schematic drawing of the circuit.



Conducted by
Second Lieutenant
H. M. Randel



The operation of the fuze is comparatively simple. The fuze, located in the side of the bomb, is mechanically connected to a charging bar, which is part of the bomb bay. The electrical circuit may then be traced in the following line diagram.



It consists of the fuze (a), the charging bar (b), with its charging plug (Continued on page 61)



Conducted by
Technical Sergeant
G. A. Orsino

General. -- The Shop Work Order is the vehicle through which all work done in the shop is made of record. It constitutes authorization from the Shop Headquarters to the Chief of Section to proceed with the work outlined thereon.

No work should be done by any section unless a work order is issued to cover it. This insures maintaining accurate and detailed records of repairs made, materials and parts used, and labor expended by all sections.

On the opposite page is shown the face of a work order blank that has been filled in as explained below. Reference should be made to the opposite page in connection with the description that follows.

SHOP WORK ORDER. General Description. -- The work order shown may be considered as consisting of five separate sections. The first section shows information regarding the organization for whom the work is being done, materiel to be repaired, and repairs required. The second section, when completed, gives a brief narrative report from the Section Chief as to what work actually was done. The third section is provided to record the cost information of parts and labor. The fourth section accomplishes the transfer of property responsibility from the organization to the shop and back again. The fifth section (to be shown in the March issue) is found on the reverse side of the work order and shows a detailed list of repair parts and material used to effect the repair as well as the unit and total cost of same.

FIRST SECTION.

Date. -- Enter Date work order is issued.

No. -- Work orders should be numbered to expedite identification. A simple method is to start a new series on January 1st of each year with number 1 followed by a dash and the last two digits of the calendar year. For example: The first work order for the year would be numbered 1-41, the second 2-41, etc.

For. -- In this space is entered the designation of the organization for whom the work is being done. This may be a line organization, some other section of the shop, or other Ordnance activity on the Post. Example: Battery B, 121st Field Artillery, or Small Arms Section, Ordnance Shop.

Materiel. -- Here is listed the materiel the work order covers. The correct nomenclature must be shown as well as the serial numbers of all serial numbered items. When the quantity of materiel is such that all serial numbers cannot be conveniently shown in the space provided a separate plain sheet of paper listing the serial numbers may be prepared and attached to the work order. The fact that a separate sheet with the serial numbers is attached should be entered on the face of the work order. Example: 100 ea. Pistols, cal..45, M1911 (See attached list for serial numbers).

Work to be done. -- The repairs requested to be entered here. Examples of typical entries: "Overhaul", "Modify in accordance with B6-W2", "Inspect".

Shop Officer. -- The Shop Officer's signature in this space is required prior to filing the completed work order.

(To be continued in the March issue)

(Please turn to page 53)

WORK ORDER

No. 14-41

Date January 6, 1941

For Battery B, 121st Field Artillery

Materiel 5 ea pistols, cal..45, M1911, Serial Nos. 14631-24611 -

3361 - 45451 - 67063

Work to be done Repair

F. GORDEN,
Capt., Ord. Dept.
Shop Officer

Date 1-9-41

Work done Replaced worn and broken parts. Checked trigger pulls.

Jos. Jones, Sgt., 21st Ord. Co.
(Chief of Section)

COST RECORD

E-2 (Enlisted \$1.70)
Labor C-3
(Civilian \$3.75)

Parts \$2.40 Total \$7.85

P. J. O.
(Cost Clerk)

Inspected Jos. Jones
(Inspector)

TALLY OUT

Received the foregoing materiel from the Ordnance Shop.

Peter Ruskin, Sgt., Btry B, 121st F.A.
(Name) (Organization)

TALLY IN

W. O. No. 14-41

Date January 6, 1941

Materiel 15 ea, Pistols, cal..45, M1911, Serial Nos. 14631--24611 -

33661-45451-67063

J. D. O.
(Shop Clerk)

(AMMUNITION)

Conducted by Technical Sergeant L. I. Dance

MODERN FUZES FOR FIELD ARTILLERY AMMUNITION, AND THEIR USES

This article will pertain only to fuzes for High Explosive and Chemical Shell, since shrapnel is no longer standard for manufacture, only for issue until the supply on hand is exhausted. Listed below are the fuzes which have been standardized within the past few years.

FUZE, point detonating, M46 (Instantaneous)

FUZE, point detonating, M47 (Delay)

FUZE, point detonating, M48 (Combination superquick - delay).

FUZE, point detonating, M51 (Combination superquick - delay).

FUZE, combination Time - Superquick point detonating, M54.

FUZE, combination Time - Superquick point detonating, M55.

M46: This fuze is a modification of the old World War Mark III, without interrupter. The upper detonator assembly has been changed to prevent premature burst in the bore of the weapon and to insure detonation on impact. An interrupter has been placed in the flash hole between the upper and lower detonators which seals this hole until the projectile leaves the bore of the weapon. The head is painted white to aid in readily identifying it as an instantaneous type fuze.

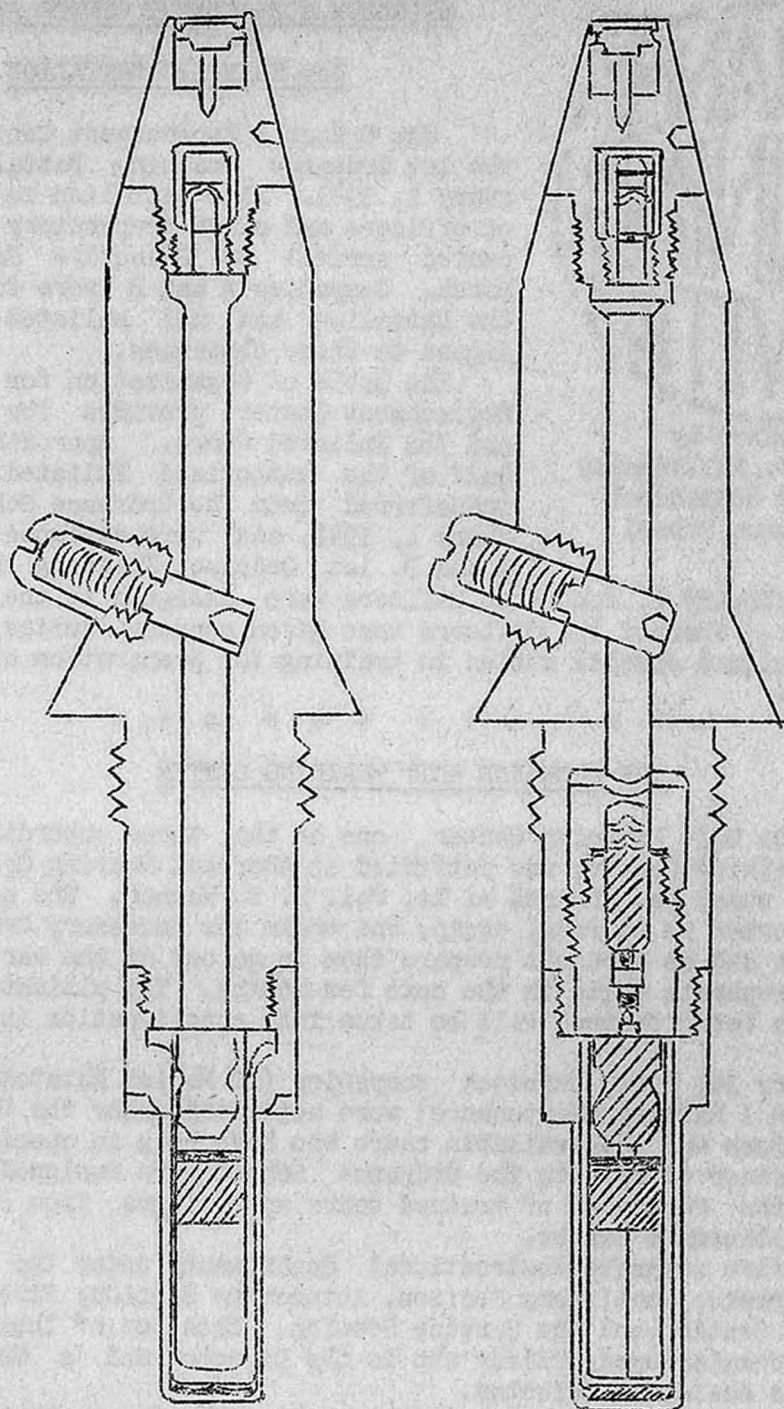
It is used in the following ammunition which has not been modified. 75-mm. to 240-mm. (inclusive) H. E. Shell of old manufacture (designated by Mk.) when no penetration of the target is desired. 75-mm. and 155-mm. Chemical Shell of old manufacture (designated by Mk.).

M47: This fuze is exactly the same as the M46 except it has a delay assembly inserted in the flash hole between the interrupter and the lower detonator. This assembly consists of a plug carrying (from front to rear) a priming composition, a delay pellet of black powder, and a relay pellet of lead azide. The fuze has .05 second delay from time of impact to time of burst. For ready identification, the head is painted black.

This fuze is used in the same caliber and types of High Explosive projectiles as the M46, when delay action is desired.

M48: All of the Field Artillery Ammunition, which is now standard for manufacture is designed for fuzes with a contour to continue the ogive of the projectile to the point of the fuze. The first satisfactory fuze of this cone shaped type to be adopted as standard is the M48. This fuze is designed for either superquick or delay action. This setting of the fuze for either superquick or delay is accomplished by means of a fork set in the side of the fuze body. The head of this fork is slotted to receive the blade of a screwdriver. When this slot is in the horizontal position (across the body of the fuze), the fuze is set for delay. When turned 90-degrees, or to the vertical position, the fuze is set for superquick.

It has advantages over the older M46 and M47 fuzes, in that it is cone shaped to decrease wind resistance on the nose of the shell. It can be set for either superquick or delay action at will. It is bore safe. It is permanently attached to the projectile at place of assembly of the complete round by the manufacturer, thereby simplifying the problems of storage, shipments, issue and



M-46

M-47

use.

It is used on the latest type (M-series) projectiles for 75-mm. gun and howitzer and 105-mm. howitzer when impact functioning is desired.

M51: This fuze is almost identical to the M48, the difference being in the delay firing mechanism. The delay plunger assembly of the M48 will not stay in the armed position satisfactorily when fired from weapons which impart low rota-

(Continued on page 52)

ORDNANCE REPLACEMENT CENTER ACTIVATES

1st TRAINING BATTALION



Prepared by
Major John D. Billingsley
Assistant Commandant
The Ordnance School

The Ordnance Replacement Center activated the 1st Ordnance Training Battalion on February 1, 1941. This battalion is for training of officers and cadre preparatory to the expected arrival of Selective Service men in March. Companies A and B were formed within the battalion and all enlisted men were assigned to these companies.

The Table of Organization for the Ordnance Replacement Center provides for 133 Officers and 762 Enlisted Cadre. Approximately one-half of the authorized Enlisted Cadre were transferred from The Ordnance School on February 1, 1941, and were assigned to Companies A and B, 1st Ordnance Training Battalion the

same date. On February 1, forty-two Officers were assigned to the Ordnance Replacement Center. Four of the Officers were given company duties, and the remainder were assigned special duties in training for preparation of the Selective Service men.

* * * * *

THE ORDNANCE UNIT TRAINING CENTER

The Ordnance Unit Training Center, one of the three subordinate units of the Ordnance Training Center; was activated at Aberdeen Proving Ground, Md., on January 1, 1941 under the command of Lt. Col. H. U. Wagner. The purpose of the Unit Training Center is to form, equip, and train the necessary Ordnance Maintenance Companies and as a result prepare them to go out to the various posts in the country as separate units in the next few months. The ultimate destination of the companies being trained will be taken into consideration in the course of instruction.

On February 10, 1941, thirteen companies (10 Medium Maintenance, 2 Heavy Maintenance, and 1 Railway Maintenance) were activated under the Unit Training Center Headquarters and the available cadre who have been in specialist and non-commissioned officer courses in The Ordnance School were assigned. The companies now await the remainder of trained cadre and fillers from Selectees from the Ordnance Replacement Center.

There are five separate instructional departments under the Unit Training Center Headquarters; Small Arms Section, Automotive Section, Fire Control Section, Artillery Section, and the Service Section. Each one of these departments is headed by a commissioned officer who is the Director and a Technical or Staff who is the Assistant Director.

The program of the Small Arms Section calls for the training of some 188 Selectees in all phases of small arms inspection and repair from the .22 caliber rifle to the .50 caliber machine gun. This will be accomplished by having the Selectees actually work with the weapons, thereby enabling them to learn the function and nomenclature of each item.

The Automotive Section is concerned with the training of the Automotive Sections of 12 of the new Maintenance Companies. The mission of this Section is to produce competent mechanics who can cope with the field problems confronting

(Continued on page 66)

The following is a list of Ordnance Companies now organized and those to be activated in the near future:

1st Ordnance Co. (MM), 10th Ord. Bn. (Maint. & Supply), First Army, Madison Barracks, N. Y.

2nd Ordnance Co. (MM), 8th Ord. Bn. (Maint.), VIII Corps, (Third Army), Fort Sam Houston, Texas.

3rd Ordnance Co. (MM), 9th Ord. Bn. (Maint.), IX Corps, (Fourth Army), Fort Lewis, Wash.

4th Ordnance Co. (MM), 3rd Ord. Bn. (Maint.), III Corps, (Fourth Army), Fort Ord, California.

5th Ordnance Co. (MM), 6th Ord. Bn. (Maint.), VI Corps, (First Army), Aberdeen Proving Ground, Maryland.

6th Ordnance Co. (MM), GHQ Troops Fort Monroe, Virginia.

7th Ordnance Co. (MM), 13th Ord. Bn. (Maint. & Supply, Fourth Army), Aberdeen Proving Ground, Maryland.

8th Ordnance Co. (MM), GHQ Troops Aberdeen Proving Ground, Maryland.

9th Ordnance Co. (MM), 12th Ord. Bn. (Maint. & Supply), Third Army, Ft. Sill, Oklahoma.

10th Ordnance Co. (MM), Panama Canal Department, Corozal, C. Z.

11th Ordnance Co. (MM), Hawaiian Division, Schofield Barracks, T. H.

12th Ordnance Co. (MM), P. S., Philippine Division, Fort Stotsenburg, P. I.

13th Ordnance Co. (MM), 13th Ord. Bn. (Maint. & Supply), Fourth Army, Aberdeen Proving Ground, Maryland.

14th Ordnance Co. (MM), GHQ Troops, Aberdeen Proving Ground, Maryland.

15th Ordnance Co. (MM), 10th Ord. Bn. (Maint. & Supply), First Army, Fort Bragg, N. C.

16th Ordnance Co. (MM), GHQ Troops, Aberdeen Proving Ground, Maryland.

18th Ordnance Co. (MM), 3rd Ord. Bn. (Maint.), III Corps, (Fourth Army), Aberdeen Proving Ground, Maryland.

20th Ordnance Co. (MM), Panama Canal Department, Post of Corozal, C. Z.

21st Ordnance Co. (MM), GHQ Troops, Aberdeen Proving Ground, Maryland.

22nd Ordnance Co. (MM), 11th Ord. Bn. (Maint. & Supply,) Second Army, Fort Knox, Kentucky.

23rd Ordnance Co. (MM), 11th Ord. Bn. Maint. & Supply,) Second Army, Fort Sheridan, Illinois.

24th Ordnance Co. (MM), GHQ Troops, (2nd Cavalry Division), Fort Riley, Kan.

25th Ordnance Co. (MM), GHQ Troops, Aberdeen Proving Ground, Maryland.

26th Ordnance Co. (MM), 12th Ord. Bn. (Maint. & Supply, Third Army, Aberdeen Proving Ground, Maryland.

27th Ordnance Co. (MM), GHQ Troops (1st Cavalry Division), Fort Bliss, Tex.

28th Ordnance Co. (MM), 4th Ord. Bn. (Maint.), IV Corps, (Third Army), Fort Oglethorpe, Georgia.

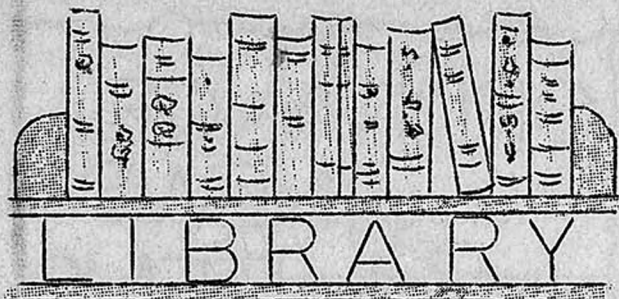
29th Ordnance Co. (MM), 6th Ord. Bn. (Maint.), VI Corps, (First Army), Fort Devens, Massachusetts.

(Continued on Page 63)

ORDNANCE NEWS ITEMS



Prepared by
Lt. W. L. Boland
Assistant Secretary
Ordnance School



by Technical Sergeant E. R. Manfrin

Now, if you were to belong to a Medium Maintenance Company and discover that your section was shifted over to a heavy outfit, would you wander around muttering all the words you know in the "Good Book" just loud enough to hear your own voice, or would you get busy and start preparing the necessary information to whip things into shape?

If you were one of those in the sudden shift, or having just graduated from school, and you wanted a schematic diagram of the three maintenance companies (at war strength), there is an excellent double page of such a diagram available in the January-February, 1941, issue of Army Ordnance.

This diagram pictures the numbers of trucks necessary for the MM, HM and LM companies, plus their designation and types of trucks. The LM consists of 23 vehicles of various types; a total of 38 for the Medium Maintenance Company; and 82 vehicles in the Heavy Maintenance Company. This drawing lists the eleven types of repairs and maintenance operations for which the vehicles are equipped; the several basic functions of the Ordnance maintenance company, and their characteristics.

In this same issue the ammunition men will find an article by Col. H. H. Zornig, Aberdeen Proving Ground, very interesting and perhaps helpful.

Starting in a jocular vein, Col. Zornig refers to methods for distinguishing between satisfactory and unsatisfactory ammunition, referring mostly to manufacturer's production and final acceptance by the Army.

The Small Arms men will find an article written by Lt. Col. Calvin Goddard, (Ord. Res.) dealing with the H & R Reising Submachine Gun, which might be a preview for an additional weapon to be met up with in the course of their duties.

While still on the Army Ordnance, I'll go back a month to the Nov. - Dec., 1940, issue, to an article written by Capt. Joseph M. Colby, discussing in full detail the new "Ordnance Battalion". This is of interest to those Ordnance Sergeants who might be of "The Old Army" and find the new streamlined set-up too fast for them, at first.

Capt. Colby delves into the simplicity, as well as the duties of the Ordnance Battalion, bringing into the open both administrative and tactical moves. Even the deficiencies of several needed tools in a Medium Maintenance Company are included, among those being a medium size milling machine, blacksmith's forge, a 40-ton hydraulic press and other items.

To shift from outside journals to those printed by the War Department, we run across Technical Manual 9-360 -- 3" AA Gun Materiel (Mobile.) This manual not only includes items pertaining to the efficient operation of materiel by the using arms and services but also takes into consideration the use and care of ammunition, spare parts and accessories. Sighting equipment and fire control equipment are two other items of importance in the operation of a gun, and these two items are clarified in this new TM.

Having been sent to an organization, reporting for duty, and then discovering that the status of the organization has been changed, leaves one in a state of mild confusion ---- The Company Commander has started the ball rolling, but the tragic part is the fact that the ball is rolling right towards you.

As an Ordnance Sergeant you will find yourself cajoled, berated, belittled and (in thought) beheaded if you were to start the ball in another direction.

Not realizing the tremendous part airplane engines are playing in this mad scramble for a perfect division, we often neglect the more unimportant things. Perhaps I had better state that I am not speaking of airplane engines as used in a plane, but I am now calling attention to the last four manuals received in this library dealing with (1) Aircraft Engines (TM 1-405); (2) Aircraft Electrical Systems (TM 1-406); (3) Aircraft Induction, Fuel and Oil Systems (TM 1-407); and finally Aircraft Engine, Operation and Test. Before suggesting my going to the Air Corps, I would like to point out that to the Automotive men and Ordnance Sergeants these last four manuals mentioned are valuable in their studies and as reference books, for the Ordnance man is concerned with those aircraft engines. Man, Oh Man!! I spent a couple of days trying to figure out the operations of an aircraft unit after it had been pulled out of the tank and that's where the manuals enter into the picture.

Your tanks have airplane engines which need the utmost care and watching over - equal to that of a plane's engine. If one has forgotten the fuel system or perhaps the electrical wiring, refer to these manuals for future guidance and they will not lead you astray.

Students in machinists courses and apprentice machinists in the field come into their own with the publication of Technical Manual 1-420, dealing with Lathes. The nomenclature and maintenance, and all other incidentals leading up to and including the use of a lathe, are described in this particular manual. I am not suggesting that embryo machinists take the book and, after hours, go to the shop and try to work the lathe with one hand, while holding the book with the other, but, I am of the opinion that this manual, when studied after hours, might clear up seemingly hard operations the next day. To the beginner, it will be of beneficial value, for a lathe will not seem like an intricate piece of work, and the advanced machinist can always review his past work.

New Army Regulations to be on the lookout for are 775-10, dated January 1, 1941, and titled "Qualification in Arms and Ammunition Training Allowances." They should find their paths into the binders holding your Army Regulations.

* * * * *

We have always had a sneaking suspicion that the 76,230 lariats purchased by the Government during the last war were used by and issued to, harassed Mess Sergeants for the lassoing of reluctant kitchen police, or "Cook's Helpers", as they are sometimes classified in the new Army.

* * * * *

The Governor of Massachusetts declared November 9, 1918, to be the "State Nut Gathering Day". All types of nuts were gathered, and their shells were burned to produce charcoal for the gas masks the Government was manufacturing. The baking, or "activation", of this same charcoal was done by the Ward Baking Company, of Brooklyn, N. Y., free of charge.

* * * * *

The explosives in common military usage are as stable as the Rock of Gibraltar in comparison to some that are known to chemistry. There are certain acetylides of silver and copper so sensitive that the slam of a door, or even a scratch will cause their explosion. The apex of unpredictability, however, is found in a brown powder -- Nitrogen Iodide -- produced by the reaction of ammonia with iodine. The tickling of it with a feather, or merely breathing on it, will cause its detonation.

THE ORDNANCE COMPANY - MAINT., RY. ARTY.

(Continued from page 31)

three Service Platoons. These cars are equipped with the necessary machine tools, hand tools, and materiel necessary to enable the Platoon to perform all of the usual repairs required on Railway Artillery materiel. Items requiring repairs beyond the capabilities of the company are sent back to shops located in the communications zone or the zone of the interior.

4 - 60-foot, drop end, gondola cars, one of which is assigned to each Service Platoon and one to the Company Headquarters. These gondolas are used to transport the trucks assigned to the company. Each car will carry all of the trucks of one Platoon. The car assigned to the Company Headquarters will carry the command car and have sufficient space to also carry the headquarters equipment.

1 - $\frac{1}{2}$ -ton command truck which is assigned to the Company Headquarters for use of the Company Commander.

6 - $\frac{1}{2}$ -ton pick-up trucks, two of which are assigned to each Service Platoon. They are used as general utility vehicles.

3 - $2\frac{1}{2}$ -ton cargo trucks, one of which is assigned to each Service Platoon. They are used to carry spare parts and general supplies, including cleaning and preserving materials.

As all of the equipment is either mounted on railway cars or can be loaded on cars, the company is completely mobile and can go wherever there are railway tracks.

TRAINING

The training of the Ordnance Company, Maintenance, Railway, Artillery, will be very similar to that of any other type of Ordnance Maintenance Company, with the exception that the training will specifically stress the maintenance and repair of railway artillery and railway mounts. The only specialist whose duties are not comparable to those in any Maintenance Company is the railway airbrake mechanic.

OPERATION.

Normally the battery personnel of the Coast Artillery units will make adjustments and minor repairs and will perform first and second echelon maintenance on railway artillery materiel.

The Ordnance Company attached to the regiment will make more extensive repairs and will furnish such items of Ordnance supplies as are carried with the company. Other items of Ordnance supplies will be requisitioned by the company from depots in the communication zone or the zone of the interior.

Any repairs beyond the capability of the company are sent back to the communication zone or the zone of the interior where shops will be established with permanent or semi-permanent installation of machinery capable of handling major repairs. These shops may be established in the existing shops of commercial railway companies.

In peace time, the Company will normally have a permanent station. However, in time of war, the Company will travel with the regiment of Coast Artillery which it serves, and will go wherever that regiment is ordered.

The End.

"LIVES OF GREAT MEN"

(Continued from page 29)

expansion, but they pass by very quickly -- we must grasp them quickly, too!

Men who apply themselves diligently to small tasks, yet are ever ready to accept opportunities presented to them with sincerity and confidence, need not, seek fame -- for fame seeks such men. Perhaps not the fame which came to Washington or to Lincoln, but fame greater than that which ordinarily comes to the average man.

It's sad but true that

"LIVES OF GREAT MEN OFT' REMIND US" -- Of our own negligence and wasted opportunities.

ARMY PERSONNEL SYSTEM

(Continued from page 37)

world. Space here does not permit a detailed description of their operation.

These units are established at Corps Area Headquarters by Corps Area Commanders. In Corps Areas where the military population may require additional units of this type, they are established by Corps Area Commanders at selected locations upon approval by the War Department.

The personnel assigned for duty at Machine Record Units consists of officers, warrant officers, and enlisted men, to supervise and operate administrative machinery. Civil Service civilian employees are employed for technical operation to the extent permitted by funds furnished by the War Department.

The purpose of the Machine Records Units is to act as service bureaus, as part of Corps Area Service Commands, and to perform the mass of personnel administrative functions for all units served. They prepare all rosters, returns, and personnel reports to higher headquarters and furnish units they serve with a wide variety of administrative data required for local administration. Copies of rosters and returns prepared for higher headquarters are sent to appropriate Administrative Centers where they are checked for accuracy and steps taken to correct any errors found.

A Machine Record Unit, established at a Corps Area Headquarters where but one such unit is allotted, will serve all Tactical Units, Corps Area posts and installations, Air Corps Units, and exempted stations within that Corps Area. In Corps Areas where additional subsidiary unit or units may be established, subsidiary units will serve such organizations or stations as designated by the Corps Area Commander.

In time of war, Machine Record Units will be established at GHQ and, if practicable, at Army Headquarters. Should military operations require such action, these units will be set up well forward in the Communications Zone, at which locations the manual operations used in the Combat Zone will be transferred to the machine operation.

The main duties of Machine Records Units are:

(1) To furnish organizations which they serve with administrative data; reports, and records necessary to facilitate administration within Administration Centers and Personnel Sections.

(2) To furnish headquarters of higher echelons and the War Department with rosters, strength returns, casualty reports, unit historical records (diaries),

etc., heretofore prepared manually by company and regimental personnel.

These duties are accomplished by converting data received from Administration Centers in Reports of Change to punched card records from which reports and listings (rosters, returns, etc.) are prepared mechanically -- thus reducing or removing the probability of human error.

5. We have covered, briefly, the organization and operation of the new army personnel administration system. How will this system operate to accomplish the primary requirement - i. e., prevent the duties of personnel administration from interfering with training of troops?

a. First: by having moved a large percentage of company administration from company headquarters to the Unit Personnel Section (Service Records, Payrolls, Reports of Change, Soldier's Qualification Cards, Routine Personnel Correspondence).

b. Second: by having moved the Unit Personnel Section from Unit Headquarters to the Administration Center still farther to the rear to Corps, Division, or Post Headquarters, thus relieving organization and unit commanders of many details and giving them more time for training of troops.

c. Third: by having moved certain administration functions (preparation of rosters, returns, casualty lists, historical records, etc.) still farther to the rear to Corps Area Headquarters; or in the field to GHQ, army headquarters, or the Communications Zone and providing rapid mechanical means for their preparation.

6. The success of the new system and the amount of administrative detail that may be removed, might be said to depend upon our actions in administration. We are confronted with an entirely new order and a rapidly changing situation. We must, therefore, if we are to operate efficiently, take all possible action to keep step with the increased tempo by easily and willingly discarding the old and wholeheartedly applying newer and faster methods. Use the telephone and the informally written memo. The War Department has opened the field of cutting the red-tape in administration: Are we going to follow the lead and gain the benefits?

"THE ORDNANCE VIEWPOINT"

(Continued from page 32)

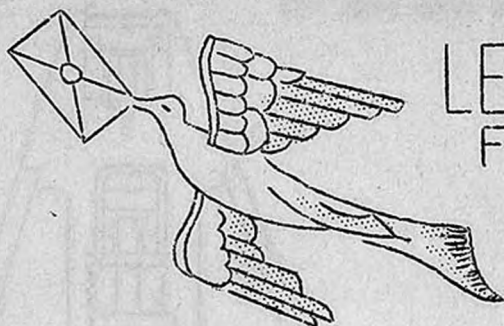
Should Ordnance mechanics be included in this force in order to make necessary repairs to materiel. And in view of the fact that the regiment is armed with everything from a pistol to a 75 mm. anti-tank gun, should such Ordnance mechanics be men with special training in both Artillery and Small Arms repairs and maintenance? Or perhaps you think that lower echelon maintenance should be sufficient. But would this normally be sufficient, or should the organization mechanics receive special Ordnance training in order to qualify them for this situation?

Will the normal spare parts set be sufficient for this situation? If not, what changes should be made in it?

You may not be called upon to answer these questions, and on the other hand you might suddenly find yourself helping to formulate an Ordnance plan for such a movement of combat troops. Give this idea a thought, study it from

"THE ORDNANCE VIEWPOINT"

and reach your own conclusions.



LETTERS FROM THE FIELD

Aberdeen Proving Ground, Maryland
February 15, 1941.

Subject: Letters.

To : All Ordnance Sergeants, all Posts, Camps or Stations.

Because of certain unavoidable delays the first issue of "The Ordnance Sergeant" was not ready for issue on January 15th, as had been planned. And because of this delay, sufficient time has not elapsed for any letters to be received from the Field in time to be inserted in this second issue.

But there will be letters in the next issue, representative of opinions of Ordnance Sergeants throughout the Ordnance Department. If you have seen the first issue you already realize that the purpose of this publication is to be helpful to all Ordnance Sergeants. You will realize that the purpose of those who devote some of their time to its preparation is to provide information on those subjects in which YOU are most interested, or in which you need help most badly.

It will be the policy of "The Ordnance Sergeant" to give its readers some advance information prior to its publication by the regular methods. The feature article in this issue, "The Ordnance Company - Maintenance, Railway Artillery", is an example of this. It will also be the policy of "The Ordnance Sergeant" to publish certain material which can be obtained only with great difficulty, if at all, from other sources. "Elementary Optics", which continues in this issue, is an example of this. It is hoped that every article appearing in every issue will be just as interesting and useful.

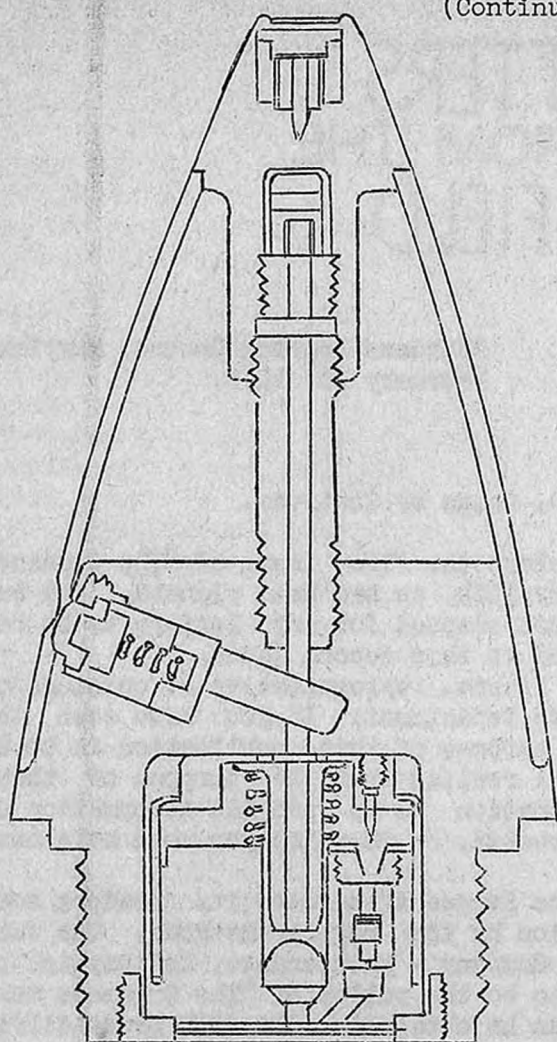
Those who prepare this publication are not mind readers. They have only one means of knowing just what material will be most useful to the readers -- the readers must make their wants known. In many instances, articles can be based on numerous similar requests from readers. Very often it may be possible to offer material in the various department pages based on requests sent in by the readers. So, Ordnance Sergeants, it's up to you. Tell us what we should give you, or be satisfied with something else. But you may be sure that every member of the editorial staff hopes to receive many hints from you.

And if you have questions which are bothering you - send them along. All questions have answers, and we'll do our very best to supply them for you.

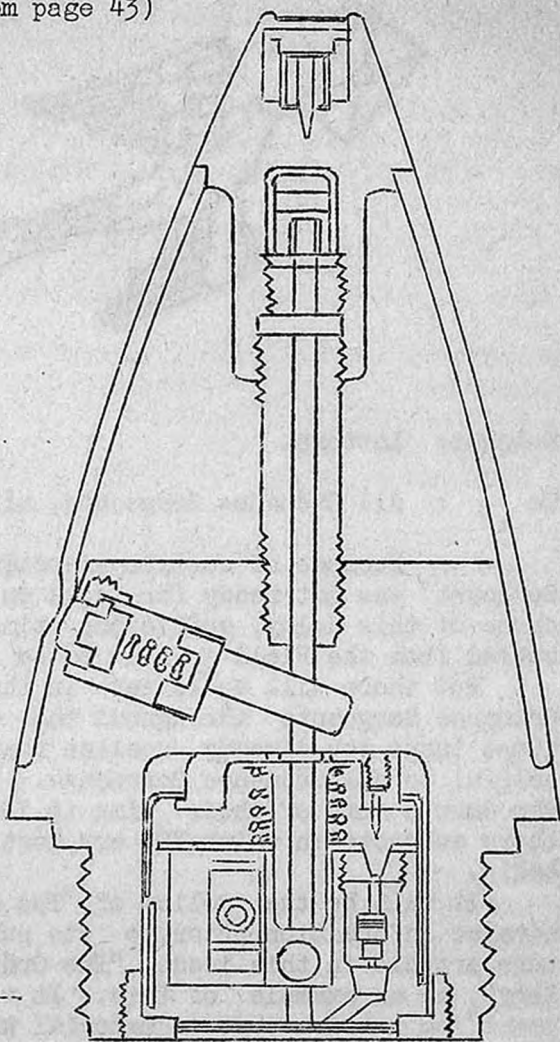
Address all letters and questions to:

"The Ordnance Sergeant"
The Ordnance School,
Aberdeen Proving Ground,
Maryland.

(Continued from page 43)



M-48



M-51

tional velocity to the projectile. For instance, the M48 will arm and remain armed during flight when fired from the 75-mm. gun due to high rotational velocity imparted to the projectile by the rifling in the bore, whereas, when fired from the 155-mm. howitzer the fuze will not remain armed due to low rotational velocity imparted to the projectile when fired. This resulted in a modification of the M48 to include a mechanical device to hold the delay plunger armed during flight of the projectile when fired from these larger calibered weapons. The fuze so modified was designated M51.

It is for use on the modified Mk.-series of High Explosive Shell of 155-mm. to 240-mm. inclusive, the modified Mk.-series of chemical shell of 155-mm., and the latest standard M-series shell of 155-mm. to 240-mm. inclusive, when impact functioning is desired. It is permanently attached to the M21 booster; this assembly is received as a separate unit, being screwed into the threaded nose of the projectile at place of use by the using arm.

M54 & M55: These fuzes were designed for use on modern shell when time burst is desired. They conform in shape to the M48 and M51 fuzes. Two powder

train rings are used, (as in the old 21-seconds, M1907M, combination time-percussion) which are timed up to 25-seconds, with an upper detonator carried in the head. These fuzes, when set for time action, are used on High Explosive projectiles against personnel or aerial targets, such as observation balloons. Should the timing mechanism fail to function, the superquick firing pin would detonate the upper detonator on impact. When desired to have the projectiles burst on impact, the setting is left at safe.

These two fuzes are identical in every respect. When fitted to the M20 booster and M-series of projectile for 75-mm. gun and howitzer and 105-mm. howitzer, it is designated M54. When fitted to the M21 booster for use in the modified Mkt.-series of projectiles for the 155-mm. gun and howitzer and the M-series of projectiles of 155-mm. to 240-mm. inclusive, it is designated M55.

THE ORDNANCE SHOP

(Continued from page 40)

As mentioned in the January issue, we have started the series outlining a simple Cost Accounting System for Ordnance Shops. It will run over a period of several issues in order to present a comprehensive picture. The blank forms published, as well as the articles, should be saved. In the meantime, we still want ideas from the Field. If some scheme you figured out saved you time, saved the Government money, or was just downright slick, send it in so we can publish it for posterity.

M1 RIFLE

(Continued from page 33)

excessive amount of oil in the rear sight will cause oil to fly back in the eye of the firer. In repairing the rear sight where it is necessary to completely disassemble the parts, it is advisable upon assembly to place a small amount of petroleum jelly on the elevating pinion.

Light oil should be applied to the following in the receiver: Follower and slide, follower arm, accelerator, in the operating rod catch and the bullet guide pin. Very little oil is necessary.

The clip latch on the receiver needs very little oil. These parts will function very well dry or nearly so, the use of oil that is too heavy, or too much oil, will cause the piece to become gummy or collect dust and show up as malfunctions.

The trigger group is lubricated with light oil and very little oil is necessary. Too much oil will cause the collection of dust and the parts will become gummy and hard action will result.

In a great majority of the cases of malfunction, the cause may be traced directly to improper lubrication. It will be found over-lubricated and large quantities of dirt and foreign matter in the weapon. In this case it will be necessary to either wash all the parts or if the case isn't too bad, it may be wiped dry and function properly. In the case of washing the piece clean, dry solvent should be used, the piece dried, and then re-lubricated in the proper manner.

You will also find rifles that have graphite grease on the follower and slide, and throughout the trigger group. This is improper and will cause the collection of dirt and dust in these parts. Or, this grease may be carried in

the chamber and cause high pressure which is very dangerous. Dust carried in the chamber in the same manner will cause hard extraction, also.

This article on lubrication is information gathered from numerous places and a wide scope of experience, yet it is not complete and can, without a doubt, be broadened as time goes on and our experience shows up new points and angles.

There will be another article of this series in the March issue, covering the repairs on the U. S. Rifle, cal..30, M1.

"THE MANUFACTURE OF GUN BARRELS"

(Continued from page 34)

order to avoid longitudinal weakness.

WIRE-WRAPPED GUN. -- A wire-wrapped gun is one in which the tube is reinforced and placed under initial compression by successive layers of wire wound about it with the proper tension. The wire may be wound with either constant or increasing tension; the constant tension is used more frequently. The number of layers of wire is varied along the tube, according to the strength required at each point.

Since the wire wrapping affords no longitudinal strength, and that of the tube is limited, a jacket is placed over the wire, with or without shrinkage. The rear of the jacket houses the breech mechanism, or else receives a breech ring for that purpose. The pull of the breech mechanism tends to cause slippage of the jacket to the rear over the wire wrapping. This is prevented by suitable shoulders on the jacket and on the tube.

The principal advantage of the wire-wrapped construction, as compared with the built-up, is economy. In addition, flaws in the material can be detected, while the larger forgings of built-up guns may have hidden defects.

COLD-WORKED GUN. -- A cold-worked gun is a single forging, placed under initial stress from the inside rather than from the outside. The internal pressure used in manufacture is such as to give the inner layers a permanent set, while the outer layers are not strained beyond their elastic limit. When the pressure is released, the outer layers tend to return to their original state, while the inner layers do not. The result is that the inner layers are compressed by the outer layers, and the outer layers in turn are held in tension by the inner layers. The method is of recent development.

In manufacture, the forging is machined nearly to size, then subjected to an hydraulic pressure of about 100,000 pounds per square inch, and finished. The liquid used in compression is either kerosene or glycerine, generally, the latter because it does not freeze under high pressure.

The container method of internal expansion is the one generally used. The gun is placed in a heavy steel jacket or container, to which it is fitted, so that it can be expanded along its entire length at the same time. Previously the expansion was successive at various points of the bore, according to the thickness.

Recent developments indicate that centrifugally cast tubes are an improvement over the forgings formerly used for cannon. The cold-worked construction, using centrifugal castings, is much cheaper and faster of manufacture than that of cannon made by former methods.

REMOVABLE LINER. -- The life of a gun usually is limited by erosion of the bore. The bores of guns of high velocity frequently are provided with removable liners, which may be replaced in the field. The tube and the liner are cold-worked separately. The liner is tapered slightly along its length, which facilitates its removal from the tube. Forward movement of the liner is prevented by shoulders. Keys at the breech keep the liner from turning. The liner is a

marked advance in gun construction, greatly prolonging the life of the gun.

RIFLING. -- The rifling consists of a number of spiral grooves in the surface of the bore. The spaces between the grooves are the lands. The purpose of the rifling is to rotate the projectile about its axis, in order to give it stability in flight. If the projectile did not rotate in flight, it would fly end over end, or tumble; its flight would be irregular and inaccurate, and the range would be reduced.

The soft copper rotating band of the projectile is forced into the grooves by the powder gases, thus causing the projectile to spin as it passes through the bore.

The twist of the rifling is the inclination of the grooves to the axis of the bore, and is expressed in terms of caliber. Thus, a twist of one turn in 25 calibers means that the projectile makes one turn in moving along the bore for a distance of 25 times its diameter. The twist is no longer than necessary for a stable flight, since a large twist tends to strip the rotating band from the projectile. The longer the projectile, the greater is the twist required. The twist, which in American practice is right hand, may be either uniform or increasing. The tendency is toward the uniform twist as being simpler to manufacture and advantageous in other respects.

The number and depth of grooves vary in different guns. Formerly, there were about six grooves per inch of caliber; now there are between six and nine. The general tendency is to increase both the depth and number of grooves.

"PROPERTY ACCOUNTING"

(Continued from page 38)

er to the consignee's property account. It must be registered on the voucher register, W. D., Q. M. C. Form No. 480, pertaining to the account of the consignor as a credit voucher and given a serial number. Then, upon receipt by the consignee, it is given the next number on the Voucher Register pertaining to the consignee's account. These numbers start at one on the first of each fiscal year, and serve as an index to all vouchers for your reference as well as the auditor. It is easy to see how these vouchers would stack up in the course of time, and had we no other system, it would be necessary to look through a lot of papers and do a lot of adding and subtracting in order to ascertain what we had on hand. This would be a slow process and very unsatisfactory, so we run a ledger on all these transactions and call it the stock record account. This involves a card for each item in which transactions have occurred. These cards in addition to showing the nomenclature of the item, show the date of the transaction, number of the voucher which will back up the entry, and whether it was an issue or receipt and the balance left on hand. Thus we have a stock record account, with a voucher register, a shipping ticket as a voucher, and a stock record card for each item listed on the voucher.

So far all we have covered is that which the interested parties do in accounting for this property. There are other important operations to be performed by disinterested persons. Periodic audits are required to be made by Officers of the Finance Department to ascertain whether or not Army Regulations are being carried out, and that no irregularities exist in the property account. Surveying Officers are appointed to ascertain the responsibility for loss, destruction, or damage to Government property by means other than fair wear and tear. Then, last, but by no means least, we have property which is worn out through fair wear and tear and requires the action of an Inspector General or a special inspector.

(Continued from page 36)

is approximately 49 degrees. If the angle is exceeded as shown in ray oe , the ray of light will not pass out through the surface of the water, but will be reflected back along ee' just as though the surface of the water were a mirror.

The critical angle for air and glass is around 42 degrees.

The critical angle is that angle in the denser medium which must not be exceeded if the ray of light is to pass out.

However, no surface will reflect all of the light that is incident upon that surface. Part of the light will pass into the surface. If we were to cut a piece of metal into a very thin sheet, we could see that some of the light would pass through the metal.

Let us now trace the ray of light that is passing through a ninety degree, right angled prism. Such a prism has one angle of ninety degrees, and two angles of forty-five degrees each (See Figure 7).

The ray P entering the ninety degree prism XYZ does not enter obliquely, and therefore, is not refracted, but passes straight through the surface, until it strikes the back side of the prism YX at O and forms an angle of 45 degrees with the perpendicular EF ; but the angle of glass and air is forty-two degrees. Therefore the ray PO does not emerge from the prism at O , but is reflected in the direction of OP' .

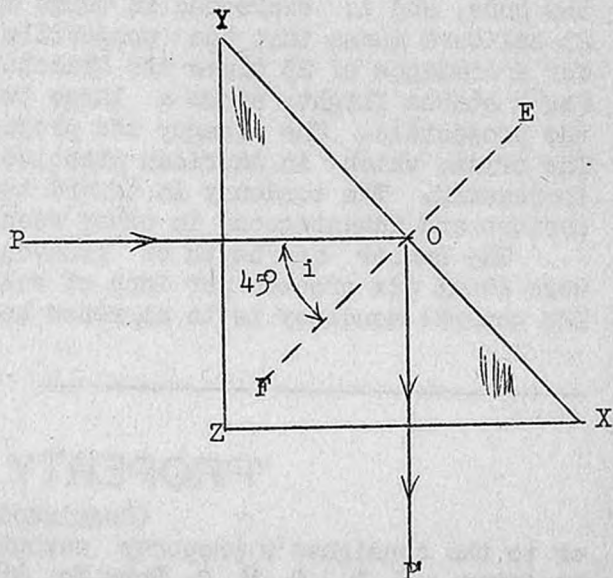


Figure 7

As the angle of incidence equals the angle of reflection, as we have already demonstrated, the OP' is reflected toward P' , forming an angle of 45 degrees with the perpendicular, EF . The ray OP' strikes the surface ZY of the prism perpendicularly, therefore, it is not refracted, but passes straight through.

By using a prism, we have taken an entering ray of light and managed to change its direction of travel 90 degrees, by utilizing the natural laws of reflection and refraction of light. We accomplished this by using the surface XY , as though it were a mirror, despite the fact that it is actually transparent; by taking advantage of the principle of the critical angle that we have studied.

Thus, instead of being a mere theoretical curiosity to remember, we discover that there is a practical application of this critical angle. It has in addition many more functions, and applications, as we will discover as we get deeper into the subject of elementary optics.

When a ray of light passes through a prism with sides that are not parallel its path will be as shown in Figure 8.

When the oblique ray of light coming from P , strikes the prism XYZ at I it is bent in the direction II' . Remembering the law of refraction, as stated in Part One, when an oblique ray of light passes from a less dense medium to one of greater density, it is bent toward the perpendicular.

In figure 8, the perpendicular is erected on the surface of the prism where the ray PI enters. As the ray of light in the prism travels from I to I' , it will leave the prism at I' and be bent away from the perpendicular constructed

at that point, according to the laws of refraction.

For when a ray of light passes from a more dense medium to one of lesser density, it is bent away from the perpendicular. Therefore, the ray of light leaves the prism at I' and is bent towards P' .

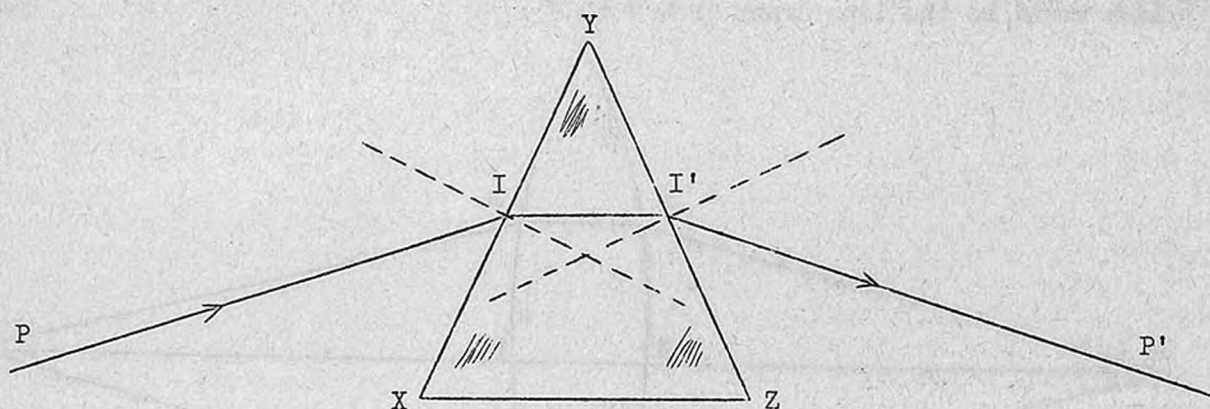


Figure 8

It is clearly shown that the ray of light is bent toward the thickest part of the prism.

Let us now take two prisms, and place their bases together as shown in Figure 9.

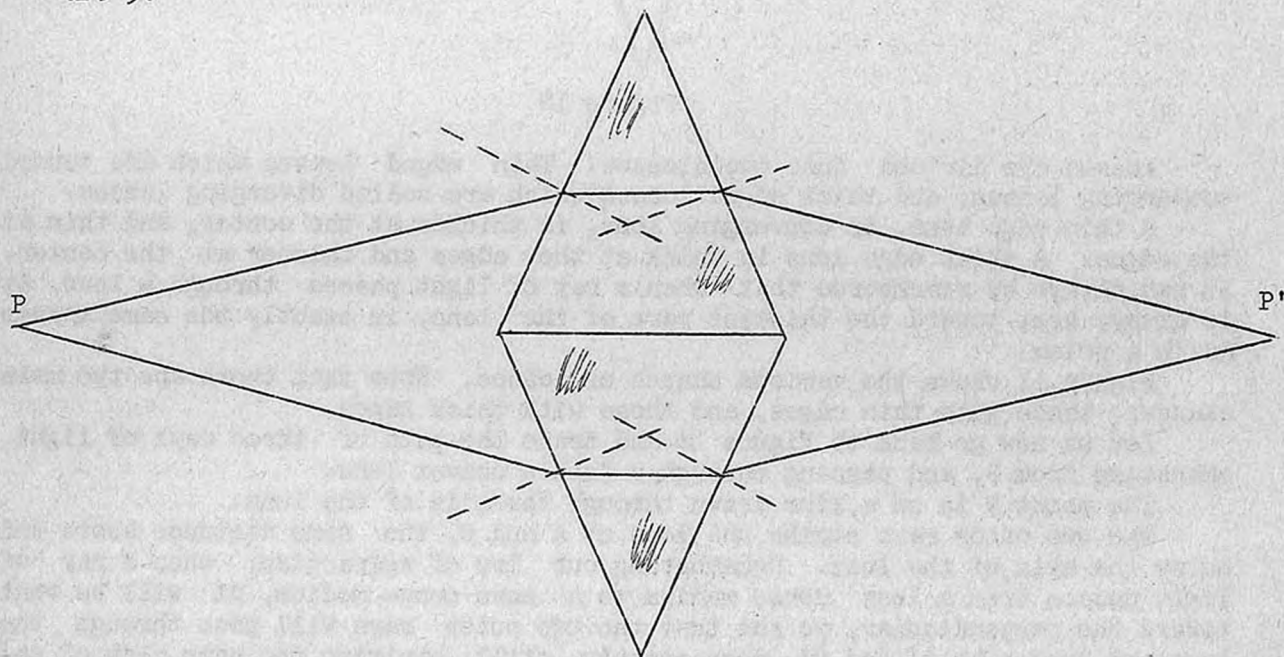


Figure 9

A ray of light from an object at P , will pass through both these prisms, and in accordance with the laws of refraction that we have studied will meet in rear of the two prisms at P' .

Let us make the front and rear surfaces of these two prisms spherical, or curved, and assume that the two bases have been cemented together. What have we now?

Actually, we have innumerable tiny prisms, lying side by side, so small

that they form a very smooth front and rear surface. We have constructed a "lens".

A lens is a piece of glass, or other transparent substance, with polished, spherical surfaces. A straight line drawn through the center of the two spherical surfaces is the axis of the lens. In Figure 10 the principal axis of the lens would be the line drawn from P to P'.

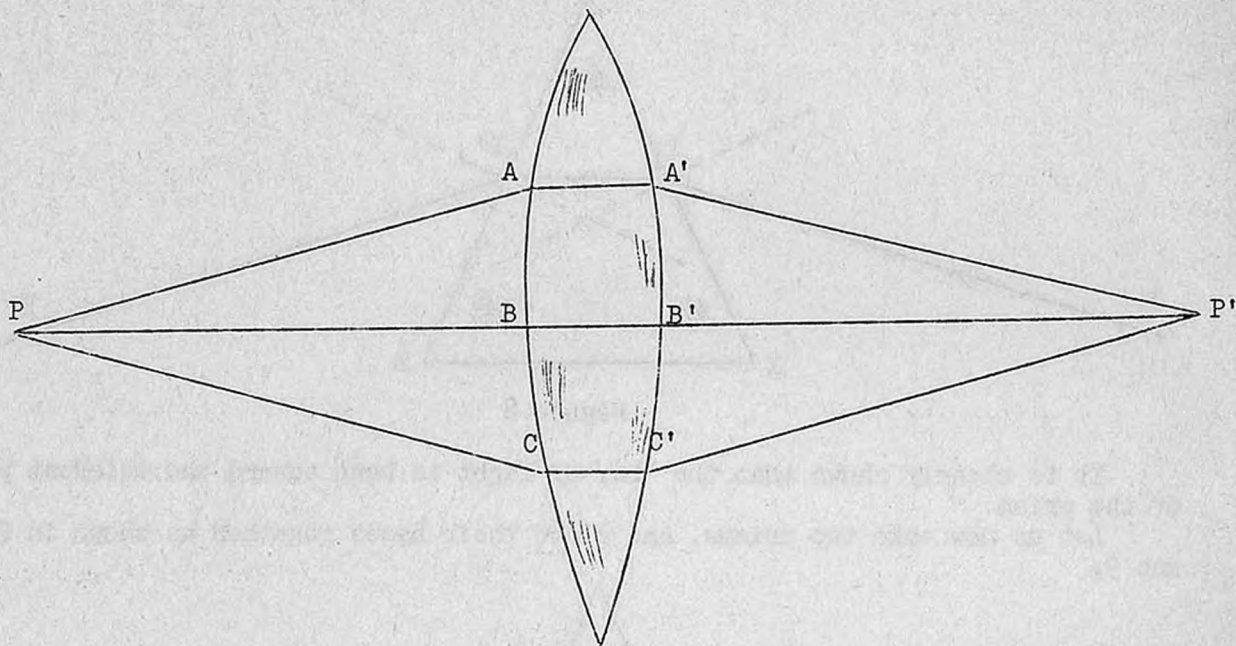


Figure 10

Lenses are divided into two classes. Thin edged lenses which are termed converging lenses; and thick edged lenses which are called diverging lenses.

A thin edge lens, or converging lens, is thicker at the center, and thin at the edges. A thick edge lens is thick at the edges and thinner at the center. It can always be remembered that when a ray of light passes through a lens, it is always bent toward the thickest part of the lens, in exactly the same manner as in a prism.

Figure 11 shows the various shapes of lenses. Note that there are two main classes; those with thin edges, and those with thick edges.

Let us now go back to Figure 10 and trace the path of three rays of light, emanating from P, and passing through a double convex lens.

The point P is on a line drawn through the axis of the lens.

The two outer rays strike the lens at A and C, the same distance above and below the axis of the lens. Remembering our law of refraction, when a ray of light passes from a less dense medium to a more dense medium, it will be bent toward the perpendicular, we see that the two outer rays will pass through the lens and emerge at A' and C', respectively, still applying the same law of refraction. The two rays will be bent away from the perpendicular, and pass through the point P' as they both have bent the same amount in opposite directions.

The central ray from P strikes the lens at B perpendicular to that surface of the lens. Therefore, it will not be bent, but will pass straight through the lens, and also through the point P'.

When rays of light parallel to the axis of the lens pass through the lens they converge on one point in its rear. This is called the point of principal

focus. It is the principal focus of the lens. The distance from the center of the lens to this point is known as the focal length of the lens (See Figure 12).

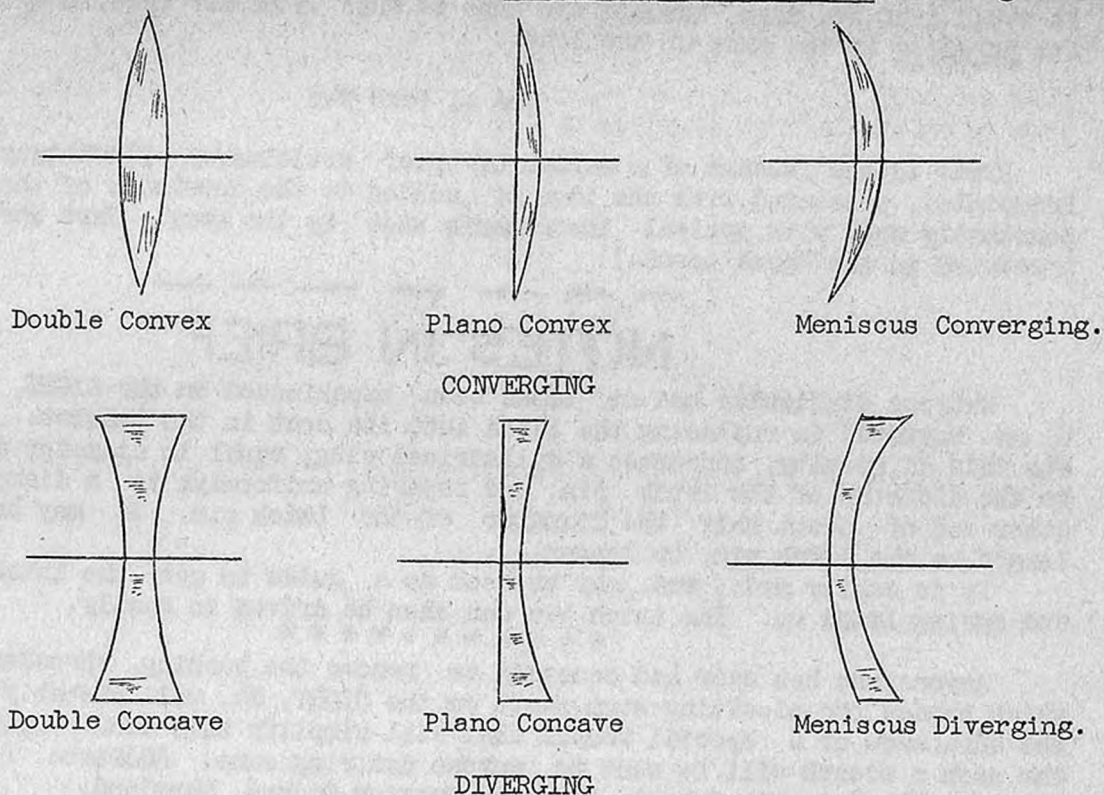
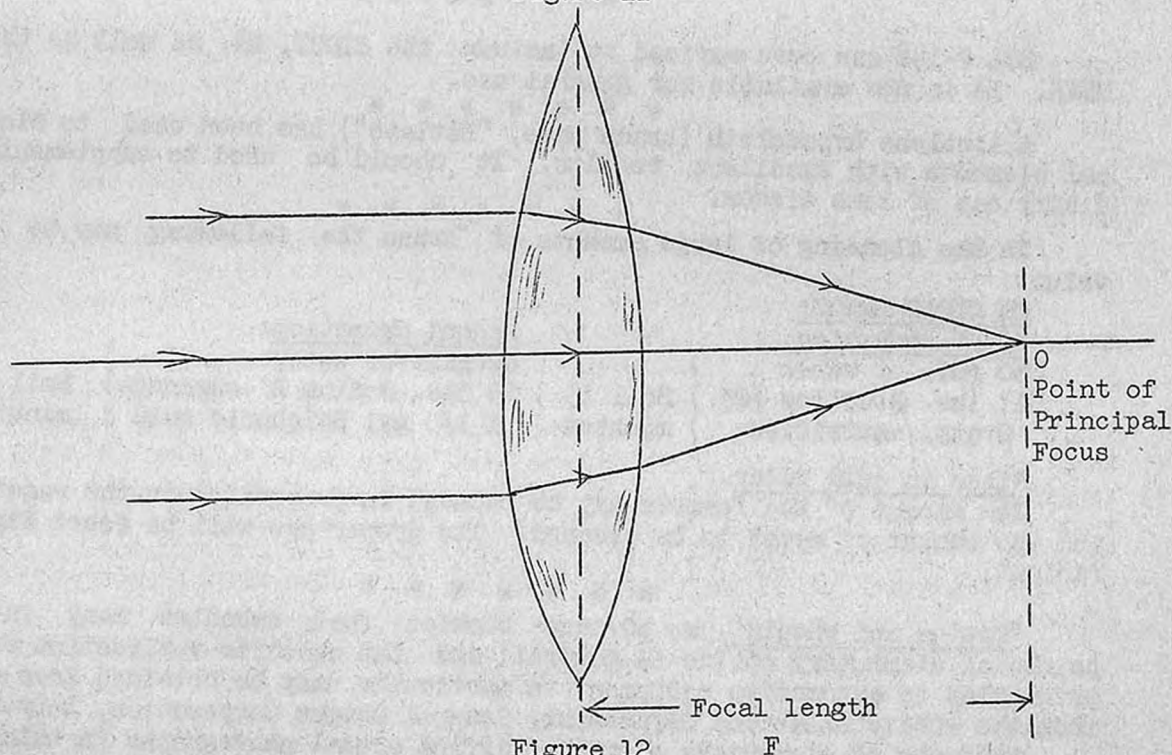


Figure 11



An incident ray and its corresponding refracted rays are reversible; that is, it can be seen that if a ray were placed at the principal focus of the lens it would send its rays through the lens in such a manner that they would come out parallel to the axis of the lens.

- End of Part Two -

(This is the second of a series of brief articles on Elementary Optical Principles, presented with the idea of adding to the knowledge of those men who constantly work with optical instruments used by the Army. Part Three will be presented in the March issue.)

NOTES IN BRIEF

Extreme difficulty has at times been experienced on the SIGHT, M4 (60 and 81 mm. Mortars) in replacing the latch into its seat in the bracket. To eliminate this difficulty, construct a cylindrical plug, equal in diameter at one end to the diameter of the latch pin, and tapering uniformly to a diameter at the other end of about half the diameter of the latch pin. It may be the same length as the latch pin, or longer.

It is easily made, and may be used as a guide to get the latch, bracket, and spring lined up. The latch pin can then be driven in easily.

* * * * *

Anyone who has ever had occasion to remove the bushing, threaded (A49975), which houses the elevating worm shaft on the SIGHT, M4, will probably appreciate the advantage of a special wrench that will simplify this task. Specifications for such a wrench will be sent to anyone desiring same. Address: Fire Control Section, The Ordnance School, Aberdeen Proving Ground, Maryland.

* * * * *

SNL F-148 has been revised to include the SIGHT, M4, as well as the M2 and M2A3. It is now available for general use.

* * * * *

A lintless broadcloth (trade name, "Batiste") has been used to clean optical elements with excellent results. It should be used to supplement the ordinary use of lens tissue.

* * * * *

In the cleaning of large amounts of brass the following may be found of value:

TO CLEAN BRASS:

First operation:

50 gal. of water)
17 lbs. Ridoline #23) Boil 15
2 qts. emulsifier) minutes

Second operation:

50 gal. of water)
25 lbs. Sodium Bi-chromate) Boil 2 to 3
1 1/5 gal Sulphuric Acid) minutes

Rinse in cold water.

The amount of the formula may be reduced in proportion to the requirements, and the amount of metal to be cleaned. Its proper use will be found highly efficient.

* * * * *

"Optics and Wheels", a 32-page booklet that embodies many interesting points on elementary optics in general; and the specific application of optical principles to automotive equipment in particular may be obtained free of charge from the Public Relations Department, General Motors Corporation, Detroit, Mich.

Students of elementary optics will find actual photographs in this bulletin

of the refraction and reflection of light through differently shaped prisms and lenses.

* * * * *

The first books on optics were published more than a thousand years ago. They were "De Optica" and "De Luce", and were written by an Arabian mathematician and philosopher named Alhazen. The accuracy of his deductions, in the light of our present knowledge, is startling, to say the least.

* * * * *

The first practical application of optical principles was made by the Chinese philosopher, Confucius, in the year 500 B.C. He is credited with the invention of the first pair of eyeglasses.

"RHEINMETALL ELECTRIC BOMB FUZE"

(Continued from page 39)

(c), the ring line (d), the switch box (e), and the source of current (f) (either a battery or generator).

The complete operation may then be described as follows:

As the bomber nears its objective, the main switch (A) of the switch box is cut in. This means that current is now flowing into the switch box and is so indicated by the glow lamp (B). The bombardier then sights the target, and sets the selector switch (C) to one of two positions, either instantaneous or delay.

We shall now assume that the bombardier has set the selector for instantaneous action. This means that current is flowing from the source (battery or generator), to the switch box, through the selector switch and the ring line, and into the charging plug. It is essential to note at this point, that the bomb is still SAFE, since the mechanical alignment of the charging bar with the fuze (b with a) is NOT an electrical alignment of the charging plug with the fuze (c with a).

The target now passes into the field of the bomb sight and the bombardier releases the bomb. As the bomb slides out of the vertical rack, an electrical alignment is made between the charging plug and the fuze (c with a). As the bomb continues to slide out of the rack this alignment is broken, and the bomb falls towards the target.

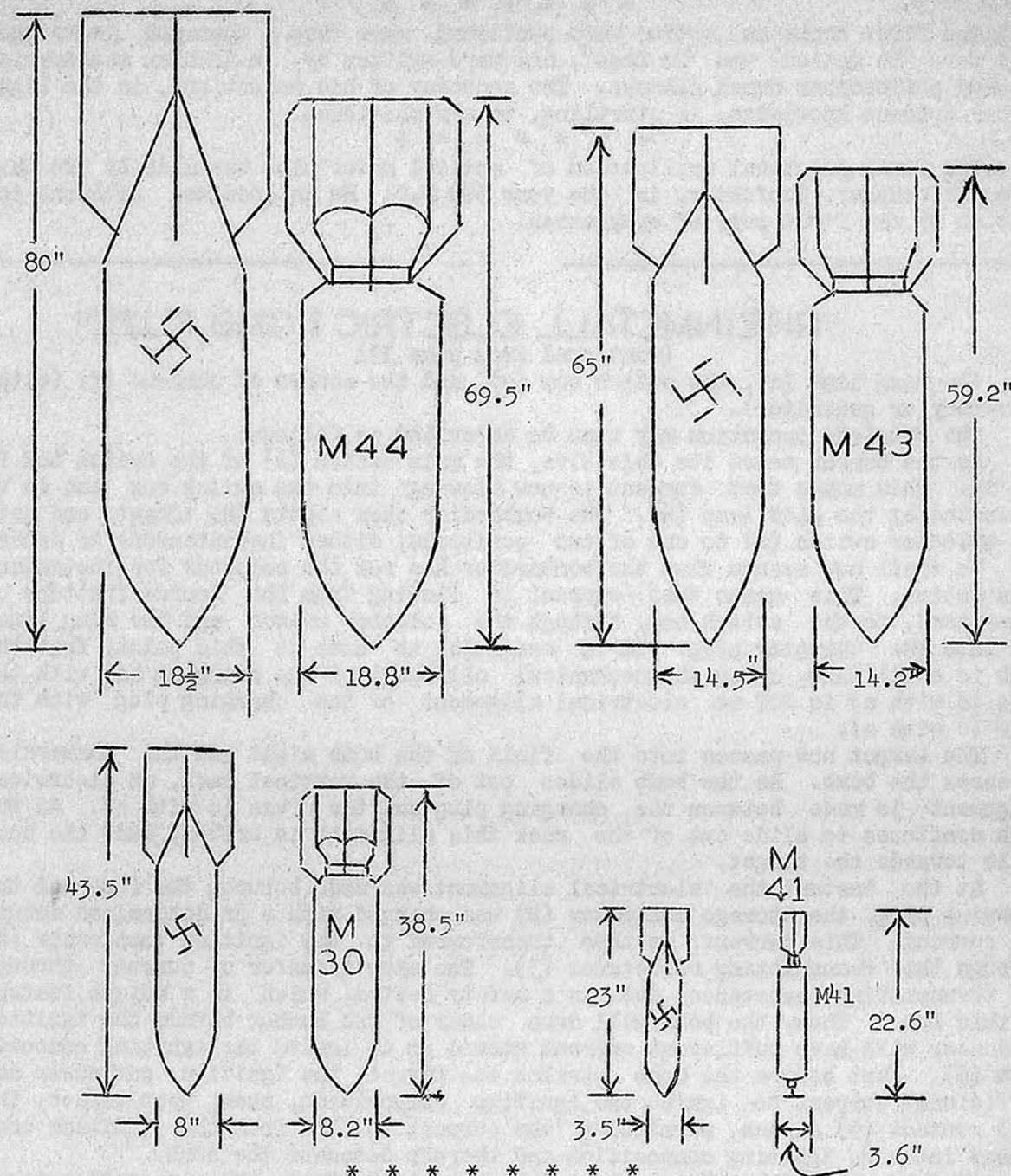
At the instant the electrical alignment was made between the fuze and the charging plug, the storage condenser (2) was charged with a predetermined amount of current. This current is then transferred to the ignition condenser (4) through the transmitting resistance (3). The slow transfer of current through the transmitting resistance acts as a safety device, which is a unique feature of this fuze. Thus, the bomb will drop clear of the bomber before the ignition condenser will have sufficient current stored up to ignite the igniting composition (6). Just before the bomb strikes the target, the ignition condenser has sufficient current to ignite the igniting composition, then, upon impact, the ball contact (5) closes, permitting the current to flow from the ignition condenser into the igniting composition and thereby detonate the bomb.

If delay action has been selected by the bombardier, the same action takes place within the fuze, and a delay powder train is introduced into the "explosive train".

If the bomb is to be dropped safe, the switch (A) on the switch box is turned to the "OFF" position and the bombs released.

This fuze is unique in every way, and combines many desirable features. It is interesting to know something of its operation, because of its wide use by the Germans. It is also interesting to note, that most of the news photographs reaching this country, show very clearly the wide use of the "Rheinmetall Electric Bomb Fuze".

The sketches shown below illustrate the text to be found on page 39.



Fifteen thousand homing pigeons set an enviable record for efficiency in the First World War, by delivering 95% of the messages that were entrusted to them. The birds cost the United States Government approximately \$2.00 each.

(Continued from page 45)

30th Ordnance Co. (HM), (Tank), GHQ Troops, Fort George G. Meade, Maryland.
31st Ordnance Co. (HM)(Field Army), 12th Ord. Bn. (Maint. & Supply), Third Army, Fort Benning, Georgia.
33rd Ordnance Co. (MM), Puerto Rican Department, Fort Buchanan, P. R.
34th Ordnance Co. (MM), 1st Ord. Bn. (Maint.), I Corps (First Army), Fort Bragg, North Carolina.
40th Ordnance Co. (Tng.), Ordnance School, Aberdeen Proving Ground, Md.
41st Ordnance Co. (Depot), Panama Canal Department, Corozal, C. Z.
42nd Ordnance Co. (Am.), Rock Island Arsenal, Illinois.
44th Ordnance Co. (PG), Aberdeen Proving Ground, Aberdeen Proving Ground, Maryland.
50th Ordnance Co. (Am.), 14th Ord. Bn. (Am.), First Army, Raritan Arsenal, New Jersey.
51st Ordnance Co. (Am.), 14th Ord. Bn. (Am.), First Army, Delaware Ordnance Depot, New Jersey.
52nd Ordnance Co. (Am.), 15th Ord. Bn. (Am.), Second Army, Savanna Ordnance Depot, Illinois.
53rd Ordnance Co. (Am.), GHQ Troops, Raritan Arsenal, N. J.
54th Ordnance Co. (Am.), 14th Ord. Bn. (Am.), First Army, Raritan Arsenal, New Jersey.
55th Ordnance Co. (Am.), (Colored), 23rd Ord. Bn. (Am.), Fourth Army, Savanna Ordnance Depot, Illinois.
56th Ordnance Co. (Am.), 14th Ord. Bn. (Am.), First Army, Nansemond Ordnance Depot, Virginia.
57th Ordnance Co. (Am.), 26th Ord. Bn. (Am.), Third Army, Savanna Ordnance Depot, Illinois.
58th Ordnance Co. (Am.), 14th Ord. Bn. (Am.), First Army, Raritan Arsenal, New Jersey.
59th Ordnance Co. (Am.), 16th Ord. Bn. (Am.), Third Army, Fort Sill, Okla.
60th Ordnance Co. (Am.), 26th Ord. Bn. (Am.), Third Army, Savanna Ordnance Depot, Illinois.
61st Ordnance Co. (Am.), Hawaiian Department, Hawaiian Ordnance Depot, T. H.
62nd Ordnance Co. (MM), Hawaiian Department, Hawaiian Ordnance Depot, T. H.
63rd Ordnance Co. (MM), Hawaiian Department, Hawaiian Ordnance Depot, T. H.
64th Ordnance Co. (Am.), (Colored), 26th Ord. Bn. (Am.), Third Army, Savanna Arsenal, Illinois.
65th Ordnance Co. (Am.), (Colored), GHQ Troops, Savanna Ordnance Depot, Illinois.
72nd Ordnance Co. (Depot), 12th Ord. Bn. (Maint. & Supply), Third Army, Fort Benning, Georgia.
73rd Ordnance Co. (Depot), GHQ Troops, Fort Bliss, Texas.
74th Ordnance Co. (Depot), Hawaiian Department, Hawaiian Ordnance Depot, T. H.
75th Ordnance Co. (Depot), Philippine Department, Philippine Ordnance Depot, P. I.
79th Ordnance Co. (Depot), 19th Ord. Bn. (Maint. & Supply), First Army, Augusta Arsenal, Georgia.
80th Ordnance Co. (Depot), 13th Ord. Bn. (Maint. & Supply), Fourth Army, Benecia Arsenal, California.
81st Ordnance Co. (HM)(Tank), GHQ Troops, Aberdeen Proving Ground, Maryland
82nd Ordnance Co. (HM)(Field Army), 13th Ord. Bn. (Maint. & Supply), Fourth

Army, Aberdeen Proving Ground, Maryland.

84th Ordnance Co. (Depot), 11th Ord. Bn. (Maint. & Supply), Second Army, Erie Ordnance Depot, Ohio.

95th Ordnance Co. (Maint. Ry. Arty.), GHQ Troops, Aberdeen Proving Ground, Maryland.

101st Ordnance Co. (MM), 6th Ord. Bn. (Maint.), VI Corps (First Army), Camp Edwards, Massachusetts.

102nd Ordnance Co. (MM), 7th Ord. Bn. (Maint.), VII Corps Second Army, Fort McClellan, Alabama.

103rd Ordnance Co. (MM), 2nd Ord. Bn. (Maint.), VII Corps (Second Army), Indiantown Gap, Pennsylvania.

104th Ordnance Co. (MM), 2nd Ord. Bn. (Maint.) II Corps, (First Army), Fort George G. Meade, Maryland.

105th Ordnance Co. (MM), 1st Ord. Bn. (Maint.), I Corps, (First Army), Fort Jackson, South Carolina.

106th Ordnance Co. (MM), 4th Ord. Bn. (Maint.), IV Corps, (Third Army), Camp Blanding, Florida.

107th Ordnance Co. (MM), GHQ Troops, Camp Livingston, Louisiana.

108th Ordnance Co. (MM), 7th Ord. Bn. (Maint.), VII Corps, (Second Army), Camp Peay, Tennessee.

109th Ordnance Co. (MM), 5th Ord. Bn. (Maint.), V Corps, (Third Army), Camp Claiborne, Louisiana.

110th Ordnance Co. (MM), 7th Ord. Bn. (Maint.), VII Corps, (Second Army), Camp Robinson, Arkansas.

111th Ordnance Co. (MM), 8th Ord. Bn. (Maint.), VIII Corps, (Third Army), Camp Bowie, Texas.

112th Ordnance Co. (MM), 5th Ord. Bn. (Maint.), V Corps, (Third Army), Camp Shelby, Mississippi.

113th Ordnance Co. (MM), 5th Ord. Bn. (Maint.), V Corps, (Third Army), Camp Shelby, Mississippi.

115th Ordnance Co. (MM), 3rd Ord. Bn. (Maint.), III Corps, (Fourth Army), Camp Marion, San Luis Obispo, California.

116th Ordnance Co. (MM), 9th Ord. Bn. (Maint.), IX Corps, (Fourth Army), Fort Lewis, Washington.

118th Ordnance Co. (MM), 4th Ord. Bn. (Maint.), IV Corps, (Third Army), Camp Blanding, Fla.

119th Ordnance Co. (MM), 2nd Ord. Bn. (Maint.), II Corps, (First Army), Fort Dix, New Jersey.

120th Ordnance Co. (MM), 8th Ord. Bn. (Maint.), VIII Corps, (Third Army), Fort Sill, Oklahoma.

331st Ordnance Co. (Avn.), Mitchell Field, New York.

332nd Ordnance Co. (Avn.), Langley Field, Virginia.

333rd Ordnance Co. (Avn.), Selfridge Field, Michigan.

334th Ordnance Co. (Avn.), Langley Field, Virginia.

335th Ordnance Co. (Avn.), Langley Field, Virginia.

336th Ordnance Co. (Avn.), MacDill Field, Florida.

337th Ordnance Co. (Avn.), Savannah, Georgia.

338th Ordnance Co. (Avn.), Lawson Field, Georgia.

339th Ordnance Co. (Avn.), Langley Field, Virginia.

341st Ordnance Co. (Avn.), Maxwell Field, Alabama.

342nd Ordnance Co. (Avn.), Hickam Field, T. H.

344th Ordnance Co. (Avn.), Albrook Field, C. Z.

346th Ordnance Co. (Avn.), Lowry Field, Colo. (Alaska).

347th Ordnance Co. (Avn.), Borinquen Field, P. R.

348th Ordnance Co. (Avn.), Philippine Department.

361st Ordnance Co. (Avn.), McChord Field, Washington.
 362nd Ordnance Co. (Avn.), McChord Field, Washington.
 363rd Ordnance Co. (Avn.), McChord Field, Washington.
 364th Ordnance Co. (Avn.), Hamilton Field, California.
 365th Ordnance Co. (Avn.), March Field, California.
 366th Ordnance Co. (Avn.), Hamilton Field, California.
 367th Ordnance Co. (Avn.), Hamilton Field, California.

The following is a list of Ordnance Battalions now organized and those to be activated in the near future:

1st Ordnance Battalion, Maintenance, (I Corps Troops), Columbia, S. C., (Consists of 34th Ord. Co. (MM); *35th Ord. Co. (MM); and 105th Ord. Co. (MM) (30th Div.).

2nd Ordnance Battalion, Maintenance, (II Corps Troops), Fort George G. Meade, Maryland. (Consists of 103rd Ord. Co. (MM) (28th Div); 104th Ord. Co. (MM) (29th Div); and 119th Ord. Co. (MM) (44th Div.).

3rd Ordnance Battalion, Maintenance, (III Corps Troops, Presidio of Monterey, California. (Consists of 4th Ord. Co. (MM); 18th Ord. Co. (MM); and 115th Ord. Co. (MM).

4th Ordnance Battalion, Maintenance, (IV Corps Troops); Camp Blanding, Fla., (Consists of 28th Ord. Co. (MM); 106th Ord. Co. (MM) (MM) (31st Div.) and 118th Ord. Co. (MM) (43rd Div.).

5th Ordnance Battalion, Maintenance, (V Corps Troops), Camp Beauregard, Louisiana. (Consists of 109th Ord. Co. (MM) (34th Div.); 112th Ord. Co. (MM) (37th Div.); and 113th Ord. Co. (MM) (38th Div.).

6th Ordnance Battalion, Maintenance, (VI Corps Troops), Fort Devens, Massachusetts. (Consists of 5th Ord. Co. (MM); 29th Ord. Co. (MM); and 101st Ord. Co. (MM).

7th Ordnance Battalion, Maintenance, (VII Corps Troops), Fort McClellan, Alabama. (Consists of 102nd Ord. Co. (MM) (27th Div.); 108th Ord. Co., (MM) (33rd Div.); and 110th Ord. Co. (MM) (35th Div.).

8th Ordnance Battalion, Maintenance, (VIII Corps Troops), Fort Sam Houston, Texas. (Consists of 2nd Ord. Co. (MM); 111th Ord. Co. (MM) (36th Div.); and 120th Ord. Co. (MM).

9th Ordnance Battalion, Maintenance, (IX Corps Troops), Fort Lewis, Washington. (Consists of 3rd Ord. Co. (MM); *48th Ord. Co. (MM); and 116th Ord. Co. (MM) (41st Div.).

10th Ordnance Battalion, Maintenance and Supply, (First Army Troops), Governors Island, New York. (Consists of 1st Ord. Co. (MM); 15th Ord. Co. (MM); and 79th Ord. Co. (Depot).

11th Ordnance Battalion, Maintenance and Supply, (Second Army Troops), 44 South 2nd Street, Memphis, Tennessee. (Consists of 22nd Ord. Co. (MM); 23rd Ord. Co. (MM); and 84th Ord. Co. (Depot).

12th Ordnance Battalion, Maintenance and Supply, (Third Army Troops), Smith-Young Tower, San Antonio, Texas. (Consists of 9th Ord. Co. (MM); 26th Ord. Co. (MM); 31st Ord. Co. (MM); and 72nd Ord. Co. (Depot).

13th Ordnance Battalion, Maintenance and Supply, (Fourth Army Troops), Presidio of San Francisco, California. (Consists of 7th Ord. Co. (MM); 13th Ord. Co. (MM); 82nd Ord. Co. (HM) (Field Army); and 80th Ord. Co. (Depot).

14th Ordnance Battalion, Ammunition, (First Army Troops), Governors Island, New York. (Consists of 50th Ord. Co. (Am.); 51st Ord. Co. (Am.); 54th Ord. Co. (Am.); 56th Ord. Co. (Am.); 58th Ord. Co. (Am.); and *67th Ord. Co. (Am.).

(Continued on next page)

*To be activated.

15th Ordnance Battalion, Ammunition, (Second Army Troops), 44 South 2nd Street, Memphis, Tennessee. (Consists of 52nd Ord. Co. (Am.); and *66th Ord. Co. (Am.)

16th Ordnance Battalion, Ammunition, (Third Army Troops,) Smith-Young Tower, San Antonio, Texas. (Consists of 59th Ord. Co. (Am.); and *68th Ord. Co. (Am.)

17th Ordnance Battalion, (Armored Division), GHQ, 2nd Armored Division, Ft. Benning, Georgia.

19th Ordnance Battalion, (Armored Division), GHQ, 1st Armored Division, Ft. Knox, Kentucky.

26th Ordnance Battalion, (Ammunition), (Third Army Troops), Smith-Young Tower, San Antonio, Texas. (Consists of 57th Ord. Co. (Am.); 60th Ord. Co. (Am.); and 64th Ord. Co. (Am.)

51st Ordnance Battalion, Avn., Langley Field, Virginia.

52nd Ordnance Battalion, Avn., MacDill Field, Florida.

53rd Ordnance Battalion, Avn., Hamilton Field, California.

54th Ordnance Battalion, Avn., McChord Field, Washington.

60th Ordnance Battalion, Avn., Hickam Field, T. H.

61st Ordnance Battalion, Avn., Albrook Field, C. Z.

*To be activated.

ORDNANCE TRAINING ACTIVITIES

(Continued from page 44)

Ordnance troops servicing modern mechanized units. At the present time the staff of this Section is concerned with preparing a course of study designed to give a basic mechanical knowledge necessary to the proper maintenance of Ordnance vehicles and equipment. Texts, equipment and material have been requisitioned for the training of 402 Selectees from the 12 companies.

The immediate objective of the Artillery Section is the training of some 416 Selectees from the 13 Maintenance Companies as artillery mechanics. In general these men should be proficient in the repair and maintenance of all types of artillery up to and including the 155-mm gun. The mechanics of the Railway Maintenance Company, of course, will be given instruction with larger caliber materiel. Training schedules are now being drawn up with a view to making each company a balanced unit, with the personnel able to perform their missions without depending upon another maintenance organization.

The Service Section men will have training given them in machine shop, electric and gas welding, and general bench work. A short course in practical carpentry is also planned. Though most of the work of repairing leather falls to the instrument repair men, it is hoped that each Service Section will have at least one man proficient in leather working. Electricians capable of servicing all of the electrical apparatus will also be trained.

It is the earnest desire of the personnel of the Ordnance Unit Training Center that they may turn out first-class maintenance companies, as they are needed, in the short time allotted for training.

ORDNANCE SCHOOL PROPOSED TRAINING PROGRAM Effective July 1, 1941

- A. Officer's (1 month) (Courses to begin 1st of each month)
(1) - General Refresher - 40 students

(2) - Special Courses	
(a) Ammunition and Automotive	- 20 students
(b) Depot and Supply and Artillery	- 20 students
(c) Mess Management and Small Arms	- 20 students
(d) Aviation Ordnance	- 40 students
TOTAL	<u>140</u>

B. N.C.O. Courses (3 months) (Courses to begin 1st of each month)	
(1) - Ammunition	- 20 students
(2) - Depot and Supply	- 80 students
(3) - Maintenance	- 100 students
TOTAL	<u>200</u>

Total N C.O. Students 3 x 200 = 600

C. Enlisted Specialists (3 months) (Courses to begin 1st of each month)	
(1) - Armorer	- 30 students
(2) - Artillery	- 30 students
(3) - Automotive	- 40 students
(4) - Carpenter	- 10 students
(5) - Clerk	- 80 students
(6) - Cooks (Including Mess Sergeant)	- 60 students
(7) - Instrument Repair	- 20 students
(8) - Munition Worker	- 40 students
(9) - Welder	- 20 students
TOTAL	<u>330</u>

Total Specialist Students 3 x 330 = 990

D. Enlisted Specialist - Machinist (3 months) (Course to begin 1st of every third month at Springfield Section Ordnance School)	
(1) - Enlisted Machinists	- 50 students
E. Special Course - A. A. Fire Control (8 weeks) (Course to begin 1st of every other month)	
(1) - Officers	- 10 students
(2) - N.C.O.'s	- 10 students
TOTAL	<u>20</u>

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One of the bottle necks in the manufacture of clothing for troops in the First World War was the lack of needles. Production was delayed until procurement experts could obtain the necessary supply from Sweden and Japan.

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The mobility of American troops in the First World War was vastly improved when the Government purchased for military uses -- 30,000 bicycles.

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In
the
March
issue of

"THE ORDNANCE SERGEANT"

you will find a feature article
which may help you or your companions
live longer. You shouldn't neglect to read
it, any more than you should neglect to live long!

"The Ordnance Viewpoint" will discuss the meaning of
News items which may prophesy events of vital importance
to all enlisted men of the First Three Grades in
the not too distant future. And all the
department articles will be both
informative and timely;
really worth while
reading matter
for every
man.