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PNEUMATIC WEAPONS AND THEIR TECHNICAL PROPERTIES

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ANNOTATION

This article provides a brief overview of pneumatic weapons and their technical features. This article is intended to acquaint students (students) of higher, secondary special and secondary educational institutions with information about pneumatic weapons and their technical characteristics.

Keywords: gunpowder, pipe, sleeve.

DIFFERENT DISORDERS DURING PNEUMATIC RIFLE SHOT

Prevention of Air Rifles Includes:

1. The pipe duct should only be cleaned from the back, as it is a chisel steel for air rifles, and when cleaning the pipe, the outlet hole will be closed and the spread of the shafts will increase.
2. After every 400-600 shots fired, it is necessary to check and pull the piston screw, as it has no hardening and can be screwed on by itself during firing.
3. When replacing the pipe gasket, it should be removed with a sharp tool, but carefully, so as not to scratch the back of the pipe, if the new gasket thickens when laying the pipe in a horizontal position, remove the excess thickness with a sharp knife and grease the top of the pipe. when placing the starving body, it should be lightly struck with a wooden hammer. After that, the gasket should be lubricated with gun oil.

Since 1978, two new sports air rifles have been used to achieve high results - the IJ-33 pistol and the IJ-32 rifle.

Both systems fall into the category of static pneumatic guns, in which air is compressed by hand using a pump-type compressor. To obtain stable firing parameters, a single working stroke of the piston is used, and in the pistol and the initial sending of the arrow to the cuts of the pipe channel.

IJ-33 Pistol

Figure 1. IJ-33 air pistol

Preparation for firing is carried out by the upper holder of the trigger, which is released when it is pressed on the holder and pulled up and back in three stages: rising by 3-10 mm, returning to the stop position (20 mm), turn up and down until you stop (100 °). The first action unlocks the pipe channel, the second unlocks the intake window in the pipe box, provides access to the back of the pipe during firing, as well as locks the battle valve and activates an automatic lock that holds the firing handle in any intermediate position during operation, mainly to protect the hand from accidental injuries. Finally, with a third movement, the piston is pushed backwards, causing air to escape into the working space of the compressor cylinder. Once the bullet is inserted into the back of the tube, the firing handle returns to its original position. As a result, air is compressed in the compressed cylinder, the shaft is first sent to the section of the pipe channel, and the reaction mechanism is set to the contact position with the reaction. When pressed, the sheptalo stops holding the warhead in the loaded (compressed) position. The valve compression force decreases sharply and the air pressure slides down the valve and opens it to enter the ductwork.

The Pistol Release Device Provides the Appropriate Settings:

- Longitudinal position of the release device relative to the rear surface of the holder;
- Release intensity;
- Working condition of the reaction;
- The amount of "failure" of the reaction.

The design of the kick and battle valve allows for idle training. Only the first two methods are produced for this purpose, after which, when the kick is pressed, the sound of pressing the valve parts simulating the shot is heard well.

The end - the open type. The holder is an orthopedic shape without an adjustable mushroom.

The main focus of the pistol's design is to ensure its safety during firing. In addition to automatically locking the firing handle in intermediate locations, the trigger design allows firing only with a fully locked pipe channel. No firing occurs, and if the shotgun falls accidentally, even in the most dangerous position for the shooter, the pipe is "up". In this case, the reaction is locked with a special lock.

IJ-32» AIR RIFLE

Figure 2. IJ-32 air rifle

Despite the use of the same principle of operation, the design of the main components of this rifle includes a number of important differences. Preparation for firing is done only by turning

the firing handle on the right side of the pipe. At the same time, the piston moves first, the air is sucked into the working space of the compressor cylinder, then the battle valve is locked and the shock mechanism is raised. At the end of the direction, the piston heats up the compression cylinder, which, under the influence of the combat spring of the impact mechanism, falls sharply to the rear, opening the entrance to the rear of the pipe for firing. Such a combat compressor device allows to exclude the fact that the piston is filled with a pistol by the impact of the compression cylinder, and therefore can be swallowed in the size and weight of the entire weapon. During the firing of the rifle, the lowering of the combat valve is carried out by means of a special impact mechanism, not by a sheptalo with a kick. It moves the sheptal parallel to the pipe until its front end falls off.

The kick setting is the same as for the pistol, but there is no idle exercise with the shooting simulation.

The target device is a diopter. The bed is spacious and high, with a pistol holder and a Monte-te-Carlo seat that can be adjusted vertically.

The structure of the cartridges

Unitary cartridges are used in the firing process. They have all the elements needed to shoot together. Such a cartridge consists of an arrow needed to hit the target directly; powder charge, a source of energy required for an axis to fly through a pipe at a certain speed; a powder-burning capsule-burner, as well as a housing sleeve that combines all of the above elements.

ARROWS

The design of modern arrows is very diverse, but they are all characterized by three main parts:

- Head
- The Leader
- Lower (Tailed).

The head of a so-called live bullet is selected on the condition that it obtains the greatest range and stability of its flight. It can be pointed or impenetrable. It depends on the speed of the flight. The faster the head, the faster the speed. If you look closely at the pistols and rifle bullets, it's easy to see.

The leading part of the shaft is close to a cylindrical shape. This serves to reliably cut the shaft into sections, as well as to cut the powder gases forward of the shaft, as well as to ensure good direction of the shaft as it moves along the pipe. Its length varies from 1 to 2 calibers and the diameter is always 2-4% larger to better and completely fill the caliber of the weapon.

The bottom of the shaft provides a certain aerodynamic quality and can be flat bottom cylindrical or conical. Its length does not exceed the caliber.

According to the structure, the arrows can be separated:

- Without shells;
- Crustaceans;
- Half-Shells;
- Special.

Figure 3.Bulletless shell

The shells are made of the same material, have a large weight and are good at deformation when touched. The best material for bullets is lead, with additives. Such bullets are used for small-caliber weapons, 4.5-5.6 mm - for both firearms and pneumatic. Their flight speed does not exceed 400 m / s. Steel bullets for air guns are prohibited.

Figure 4. Cable arrow

The shells are made of mild steel and consist of a lead core and shell covered with a lump to protect against corrosion. If the core is steel, there is a thin lead coating between it and the shell to cut the shaft and extend the service life of the pipe duct.

Figure 5. Half-shot

The hemispheres consist of a lead core and a shell that do not completely cover the shafts. He is naked and the top of his nose remains. This is done to increase the harmful effects of the bullet.

Figure 6. Special arrows

The special ones consist of a core, at the bottom of which there are special devices to provide the desired effect, for example, drugs for sleeping animals or a mixture of fuels - on the axles of the track. Special bullets can be made of other materials (rubber, plastic, etc.).

POWDER

Smokeless (troxillin) powder based on cellulose nitrates is currently used as the energy source needed to fire a pipe at a certain initial velocity.

Depending on the solvent in which the nitrates are converted to a gelatinous state, the powders are separated:

- On the basis of pyroxylin-evaporation;
- Cordit - in fusion mixtures.

The first is mainly used for sport-hunting cartridges.

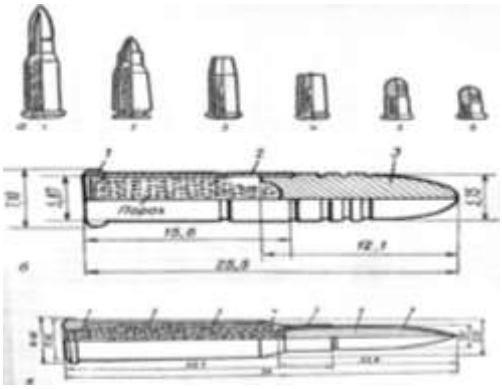

Figure 7. a - cartridges used for firing: 1 - rifle, cartridge case;

2 - rifle butts, without collars; 3 - revolver; 4 - revolver shortened; 5 - rifle, ring flammable; 6 - shortened ring flammable; b - 5.6 mm cartridge (dimensions in mm):
1 - shock organization; 2 - sleeve; 3 - bullet; v - 7.62 mm rifle cartridge (dimensions in mm): 1 - capsule; 2 - sleeve; 3 - powder; 4 - skat; 5 - tube; 6 - nucleus; 7 - coating.

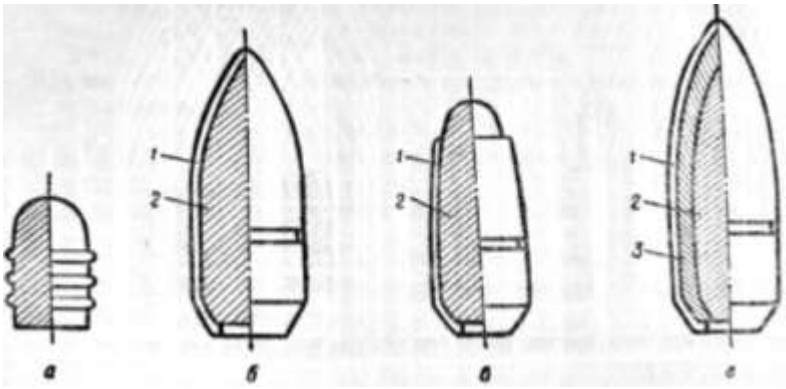

Figure 8. Arrow structure
1 - shell; 2 - nucleus; 3 - coating.
a - without shell; b - shell; c - half-shell; g - with shell coating:

The technology for obtaining pyroxylin powders is as follows. Plant fiber (cellulose) is treated with a mixture of nitric and sulfuric acid at a certain time and at a certain temperature. Stabilization - removal of contaminants - is followed by several hot washes. However, batches of nitrocellulose (pyroxylin) obtained have different properties. Several batches of pyroxylin are mixed to give the powder uniform properties, which are then treated with an alcohol (volatile) solvent. The swollen mixture is compressed through a matrix to form a variety of powders: tubes, lines, multi-channel cylinders. The powder from the matrix still contains 40% solvent, so it is dried at 24-48 ° C for 20-30 hours before cutting. After cutting, the powders are sorted, re-aerated and dried.

To increase the rate of combustion of gunpowder, this is very important for short-pipe guns, so they make it porous. For this purpose, powder grains can be in the form of plates, tapes, single and multi-channel pipes, cylinders.

The amount of gases formed during the combustion of powder grains is proportional to their burning surface. During the combustion of powder of the same composition, the surface burns depending on its shape, so the amount of gases produced per unit time may decrease, remain constant or increase.

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