

# Japanese Type 89 Grenade Launcher

## Launcher

(AKA Knee Mortar)



The Japanese Type 89 Grenade launcher is a WW2 era light mortar system, light and portable enough to be carried and operated by a single soldier, with one or more additional team member typically carrying additional ammunition. The weapon weighed just 4.7 kg, (10 lbs 6oz), with a length of 610mm (24 inches). Each of the standard 50mm diameter high explosive projectiles weighed in just 793 grams (1 lb, 12 oz), making for a very portable weapon.

While lacking the punch of a US 60mm mortar, the light weight and easy operation allowed a Japanese infantry company to be equipped with 12 of these weapons.

The nickname comes from the initial mistaken belief by US soldiers that the mortar was fired by resting the curved butt plate on one's knee or thigh. This misinformation was quickly corrected, but the name has stuck ever since.

The weapon has two main ammunition types: a dedicated Type 89 high explosive round, and a versatile Type 91 fragmentation grenade, which could be used as a hand grenade, as a grenade launcher round when equipped with a screw on booster charge, or as a rifle grenade when equipped with a screw on launcher tube and tail fins.

The HE round had rifling bands that engaged in the Type 89's rifled barrel, and had a maximum range, of 670 meters/732 yards, with the Type 91 fragmentation grenade having a max range of 200m / 219 yards.

For all ranges, the standard firing position was to brace the butt plate on the ground at a 45 degree angle from vertical. Range would be adjusted via an elevation knob on the right side of the launcher. Turning the knob raised or lowered an elevation rod within the barrel. This elevation knob was connected to the trigger mechanism and contained the firing pin for the grenade booster charge primer.

Raising the elevation rod shortened the effective length of the barrel, and increased the expansion volume of the barrel behind the grenade round, both effectively reducing the velocity and range of the grenade when it was fired at it's standard 45 degree angle. For extreme short ranges, the tip of the grenades would protrude from the barrel of the launcher. Depending on the manufacturing date, the launcher was equipped with a small bubble level clamped on the base of the barrel on the right side of the gun, that could be used to ensure that the launcher was being held at a 45 degree angle even on uneven ground. A painted or grooved and painted white line parallel to the barrel acted as a visual aiming indicator.

The launcher could be fired point blank if braced against a more vertical surface if so desired.

A cloth sleeve and spring assembly acted as a dust cover for the open slot in the receiver tube of the launcher, covering the trigger assembly slot as the trigger and elevation rod was traversed up or down the receiver.

To fire the weapon, the operator would adjust for the desired range with the elevation knob, take the grenade, pull the fuse safety pin, insert the grenade into the barrel, and pull the trigger lever on the front of the gun, cocking and firing the firing pin contained within the elevation rod. On the receiving end, the sound of the mortar firing has been likened to the sound of a champagne cork popping.

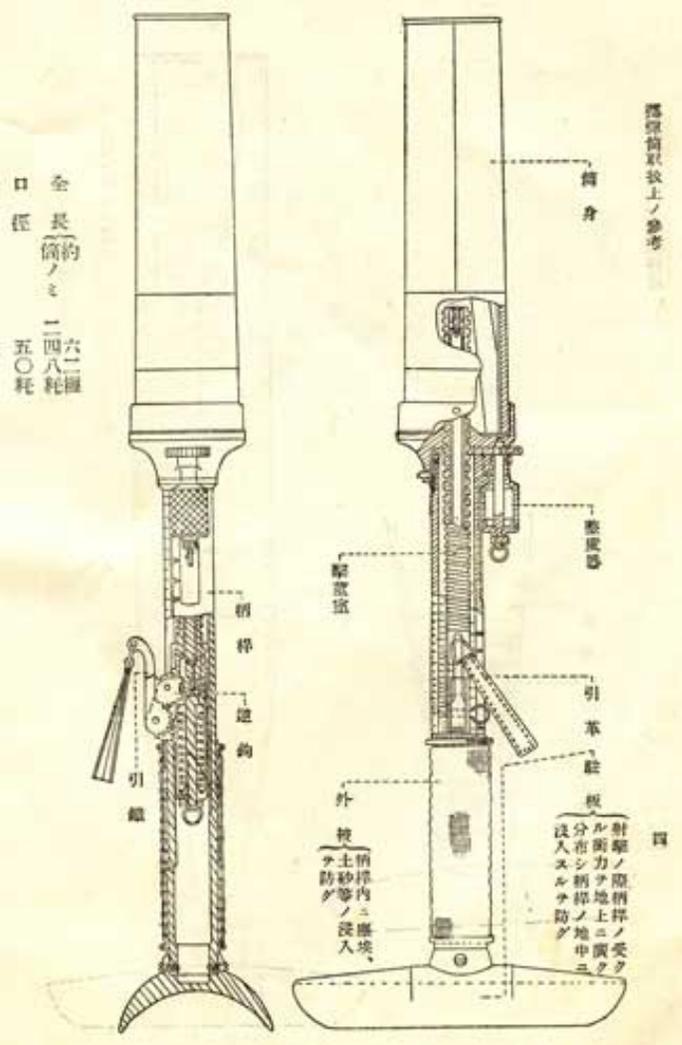
The Type 89 grenades HE grenade exploded on impact, and was dedicated to mortar use.

The versatile Type 91 grenade was modular, allowing it to be used for multiple purposes. The base grenade body could be used as a hand grenade. Using a screw on booster charge, it could be used by the Type 89 Grenade launcher, or by the older Type 10 Grenade Launcher. Or, instead of a mortar booster charge, a tube and tail fin assembly could be attached for use as a rifle grenade. When used as a grenade, the pin was pulled and the cover discarded. The soldier would then slam the end of the fuse onto a hard surface (Rifle stock, helmet, log, etc). This would light the fuse, given the soldier 7-8 seconds to throw the grenade.

As a mortar or rifle grenade round, the safety pin would be pulled, the round placed in the launcher, and the round would be fired as with the HE grenade. The inertia of the launch explosion would cause the striker to light the fuse, giving 7-8 seconds before the grenade would explode.

This grenade did not engage the rifling of the mortar, due to that, and weight and charge differences, the Type 91 grenade did not have as great of a range as the Type 89 grenade. The range scale for the Type 91 grenade was on the right side of the mortar receiver tube, with the scale on the left being used for the Type 89 grenade., type 91 fragmentation grenades exploded after a 7-8 second delay from the launch, with the fuse being ignited by the inertia of the launch explosion.

If thrown as a hand grenade, the operation was to remove the safety pin and fuse cover, and slam the firing pin into a hard surface such as a rifle stock, helmet, or log, and throw it before the 7-8 second fuse exploded.



Japanese and US diagrams of the weapon. The US drawing is not quite to scale.

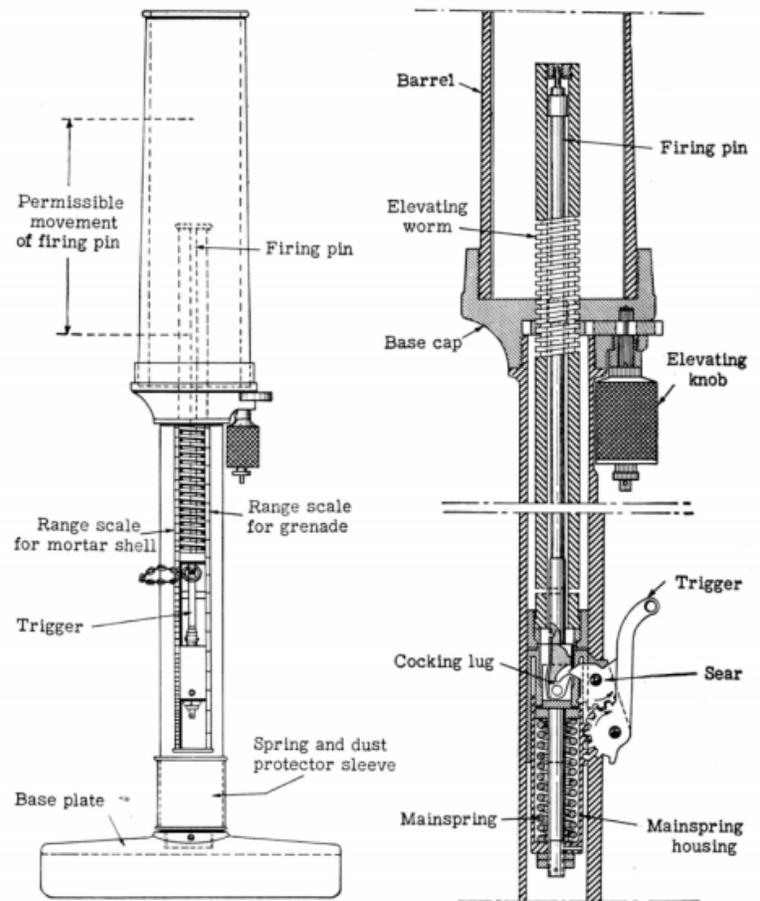


Figure 49.—Diagrammatic drawings of Model 89 (1929) 50-mm grenade discharger, showing range scales (left) and cross section of firing mechanism (right).

第十圖  
 一ノ其持保ノ筒ルケ於ニ射伏  
 面側右



左手ヲ以テ筒ノ略々中央ヲ左  
 ヲリ握リ且左臂ヲ十分伸バス

(イ) (ロ) 持十五度ニ保  
 右拳ガ柄ヲ  
 ニ觸レザル  
 如ク食指及  
 中指ヲ以テ  
 革ヲ以テ引  
 撮ム  
 上方ヨリ見  
 タルニハ左  
 ノ方ニシテ  
 一ノ方ニシ  
 方ノ筒ノ角  
 度ノトシテ  
 十度ノ角ヲ  
 成ス

歩兵隊及騎兵隊射撃教育 重砲彈藥

第十二圖  
 二ノ其持保ノ筒ルケ於ニ射伏  
 面正



頭ハ成ルベク  
 垂直ニ保テス

左眼ト筒軸トヲ含ム  
 平面ヲ垂直ナラシム

右上臂ヲ概ネ垂直ナラシム

歩兵隊及騎兵隊射撃教育 重砲彈藥

Japanese operator manual, showing the correct firing position when prone.

圖 一 十 二 第  
一ノ其 持保ノ筒ルケ於ニ射體  
面 側 右



Japanese operator manual, showing the correct firing position when kneeling.

圖 二 十 二 第  
二ノ其 持保ノ筒ルケ於ニ射體  
面 正



US rifle grenades, both the High Explosive Anti Tank shaped charge (HEAT) grenades, and the US fragmentation grenade conversion attachments could bridge the gap between hand thrown grenades and US light mortars, as the Type 89 did for the Japanese. In some use cases, such as against hard targets like bunkers and vehicles, the US grenades were superior. But the light weight and nimbleness of the Type 89 was envied by US Marines and soldiers, especially in the early days of the war, before rifle grenades were readily available in the Pacific. (See “Shots fired an Anger, a Rifleman’s view of the war in the Pacific”, Lt. Col John George)

But all of these faults—from the Infantryman user’s standpoint—could be corrected by good manufacturing. If Japanese grenade designs could be mass produced in American factories, along with a modified launcher copied from the knee-mortar, and a rifle-launcher, simply designed by our own ordnance people, we would have something much better than we can boast of at present. And we could still standardize upon one model of fragmentation grenade, just as we do now. But that one design of grenade should be adapted to launching by rifle or by miniature mortars within each Infantry rifle squad, thereby trebling its usefulness. The grenade would then become specifically fitted for several tasks which we presently allot to specialized weapons, which are heavier, less handy, *and seldom there when needed*. Such versatile grenades could be fired accurately into pillbox ports with rifles or could be lobbed over 200 yards to harass or pin down the enemy. This latter feature would prove especially valuable when the fire of heavier mortars or artillery is not available.

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AUSTRALIAN WAR MEMORIAL







Typ 89 HE Grenade Replica.

This replica disassembles into the same base components as the original round:

- Fuze and safety pin
- Payload body
- Booster charge body
- Rifling driving band
- Booster charge package



Type 91 Fragmentation Grenade Replica

This model disassembles into the same basic components of a Type 91 mortar grenade.

- fuse, fuse cover, and fuse safety pin
- Payload charge lid
- Payload body
- Mortar booster charge.

This Replica Type 89 Grenade Launcher was designed and 3D printed by curioandrelic.com, a website dedicated to “digital curios and relics”. That is to say, electronic copies of manuals, photographs, documents, an Enigma machine simulator, and 3D printed replica ordnance.

Design of the launcher and munitions was based on photos and drawings of the original weapons, and was cross checked and compared to an original launcher at the Michigan Military Museum in Jackson Michigan.

The launcher includes a functioning elevation rod adjustable via a system of gears, threaded rod, and elevation knob that is like that on the original weapon. For ease of design, printing, and assembly, the 3D model is assembled of the same major components as the original: butt plate, receiver tube, barrel cup, barrel, elevation assembly, trigger block assembly. The receiver tube of the model does unscrew from the butt plate and barrel/barrel cup assembly so that parts can be replaced. The threads on these parts are not meant for frequent disassembly / reassembly. If disassembled, be careful not to cross thread, or over tighten the threaded components, and be careful not to over twist the central receiver tube.

The 3D printed type 89 HE grenade disassembles into the same components as the original: fuse, payload housing, booster charge housing, booster charge, rifling driving band. The Type 91 grenade disassembles into a fuse, fuse cover, lid, grenade body, and booster charge as does the original. The grenade components are more sturdy, but care should still be taken not to over tighten them or cross thread them when reassembling them.

Markings on the launcher and munitions are meant to be representative of the types of markings on the originals, however the markings should not be viewed as an accurate depiction.

Keep in mind that his replica is made of lightweight PLA plastic, and any attempt to cause it to fire simulated rounds is most likely going to result in disappointment, a destroyed model, and possible injury.

To visit curioandrelic.com, enter the URL in your browser, or scan the QR code below. For support, follow the contact links on the replica device page.

