Study and Development of Chloroform Based Riot Control Grenades (RCG)

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Abstract
Riot Control Grenades-
RCGs are basically chloroform based grenades which can be used when the police/Security has to handle a haywire mob or an uncontrollable crowd which is causing damage or making the citizens uncomfortable.
Once the people causing riots experience the RCGs they will think a hundred times before causing any such nuisance.Thus, this will result in a decreased number of such situations. Not immediately, but definitely things will change and one day will come when we'll no longer have to use RCGs.

Keywords : Chloroform, grenades, haywire mob, riots

Introduction

The Chloroform based Riot Control Grenade is a smoke grenade which will be used by the riot control squad to control the crowd during extreme situations. The RCG will act as a smoke bomb whose fumes will cause the person who inhales them to lose consciousness temporarily. This, in case of extreme situations, would help the authorities bring the situation under control. As of now, the authorities resort to the use of tear gas and water cannons. In extreme conditions, tear gas is not fully useful, whereas the water cannon method just leads to wastage of water. The RCG will simply make the person who comes in contact with its fumes unconscious for a certain amount of time, which can help the authorities to control the situation when it starts to slip out of their hand, without damaging the public property in any way. The RCG has a huge potential in countries with unstable politics and constant terror threats. Apart from just riots, the grenade can also be used for strategical raids as well. RCG has many adverse effects on the human body, but it is to be noted that after all it's a weapon, and is supposed to be used in case the events go extremely out of hand only. Using the RCGs is a responsibility which the authorities will have to thoroughly respect.

Principle-

The RCG is based on the M18 smoke grenade used by the troops for signalling. The M18 is a ground to ground/ ground to air signalling device, which was first used during the First World War. Their vibrantly coloured and dense smokes were found to be useful for signalling purposes. The chemical reaction between the chemicals within the grenade will result in emission of dense smoke, which will comprise of chloroform as well, to add to the effect. Along with chloroform, the smoke will also consist of black pepper and chilli powder to make the victims more uncomfortable.

Construction-
External Structure-
The external structure of the RCG will be made up of Cylindrical Sheet Steel, and will have four holes at the top for emission of the smoke, one the grenade is ignited.

Internal Structure-
The internal structure of the RCG will consist of Potassium Nitrate- which will act a smoke producer, Sugar- Which will assist in ignition of potassium nitrate to produce smoke, black pepper and chilli powder- which will add to the effect of the RCG by making the victims even more uncomfortable and chloroform- which will play a vital part in controlling the crowd with its nauseous properties. At the end we will also have the compressed ammonium nitrate, which will act as the firepower for the RCG as it is ignited. The RCG will also consist of a fuse which will start burning as we ignite the RCG.

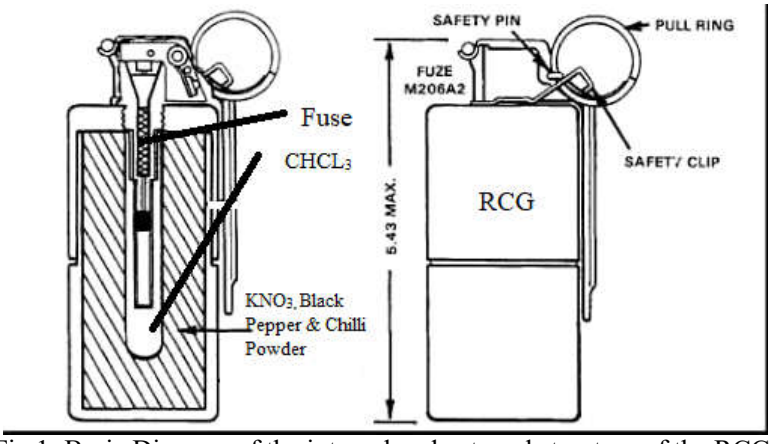

Fig 1: Basic Diagram of the internal and external structure of the RCG.

Working-

When the fuse is ignited, it will activate the potassium nitrate present within the structure of the RCG with help of sugar. This reaction between potassium nitrate and sugar will result in formation of smoke. Burning of smoke and the heat energy produced will result in the evaporation of chloroform. This smoke, along with black pepper and chilli powder will exit the body of RCG through the four holes at the top. The black pepper and chilli powder will make the mob extremely uncomfortable, and the chloroform will make them nauseous and dizzy, and evidently lead to them being unconscious for a considerable amount of time. If anyone of the mob tries to pick the RCG up and tries to throw it back towards the authorities, then there are chances that the person may get injured as the RCG would most probably explode in his/her hand due to the compressed ammonium nitrate firepower which is enabled in the RCG itself. Also as the RCG will get too hot to handle once ignited, the chances of anybody even picking it up are next to none.

Equation

$KNO_3 + C_{12}H_{22}O_{11} \longrightarrow + H_2O + KNO_2$

$C + H_2O + KNO_2 \xrightarrow{\Delta} NO_2 + CO_2$

The Potassium Nitrate reacts with sugar to form a mixture of Carbon, water and Potassium Nitrite. This mixture then in presence of heat from the RCG itself will produce Nitrogen Dioxide and Carbon Dioxide.

Pros and Cons of the RCG

The RCG has many pros and quite a few cons as well. But as stated before, RCG is a weapon, which is supposed to be handled with absolute care and responsibility and used only when there is extreme danger to public harmony and security. If used just when it is meant to be, the RCG can prove to be a very good weapon.

PROS

When the RCG starts to emit the chloroform-based smoke, more than 40% of the victims in vicinity of the RCG should be unconscious, making it really easy for the authorities to control the situation which was turning to be something far more than dangerous.

Even if people who are at some distance from the RCG are not affected by the chloroform fumes, the black pepper and chilli powder combination of the RCG will make the victims uncomfortable and give police some time to regroup and plan strategies.

Casualties during times of extreme unrest, like strategic raids, riots, terror attacks, will reduce considerably as the authorities will be able to gain control of the situation faster than they normally could.

Even though the RCG is harmful to the human body in a few ways, it is a more peaceful option, rather than inflicting physical harm to the protestors/victims.

CONS

If overused at the same location in a short period of time, the fumes from the RCG can turn toxic and inflict fatal harm to the respiratory system of the victim.

As chloroform is often used as an anaesthetic by doctors, it affects the central nervous system of the body. In case of overuse of the RCG, there is possibility that the victims in vicinity of this overused RCG gas will be affected by acute CNR (Central Nervous System) problems.

If people who are suffering from kidney and liver problems come in direct contact with the RCG fumes, it could seriously damage their weaker organs.

Precautions

If used without sufficient knowledge, the RCG would be catastrophic as it would worsen the matter rather than making things easier.

The use of RCG should be very limited and the weapon should be handled with extreme care and responsibility.

The authorities should deploy the RCG as soon as the fuse is burnt, as the RCG would get quite hot when ignited.

The authorities should wear safety gear to not be affected by the RCG themselves.

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References

The RCG is in reference to the M18 smoke grenade which is used by armed and military forces, and works on a similar principle. Not much research work is done on this topic.