

UNITED STATES PATENT OFFICE.

LOUIS G. M. ADINAU, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO L. ADINAU COMPANY, A CORPORATION OF CALIFORNIA.

EXPLOSIVE.

1,056,389.

Specification of Letters Patent.

Patented Mar. 18, 1913.

No Drawing.

Application filed April 25, 1912. Serial No. 693,180.

To all whom it may concern:

Be it known that I, LOUIS G. M. ADINAU, a subject of the Kingdom of Belgium, and a resident of the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Explosives, of which the following is a specification.

The invention relates to explosives and particularly to that class known as safety explosives which can only be fired by the use of a detonator, with the exclusion of those explosives intended to lessen the danger of the explosion of fire-damp in coal mines.

The object of my invention is to provide a safety explosive which is not violently abrupt in its action and which produces a pushing rather than a breaking effect.

Another object of my invention is to provide an explosive which is very sensitive to the action of the fulminating cap, so that it always explodes when the cap is fired, thereby obviating the dangers of mis-fires.

A further object of the invention is to provide a non-hygroscopic safety explosive.

The invention relates particularly to that class of explosives which contain a nitrate as a burning ingredient and a nitrated hydrocarbon as a combustible ingredient. The nitrate heretofore used has generally been ammonium nitrate, which even when mixed with a hydrocarbon such as trinitrotoluene is very hygroscopic, a feature which proves very detrimental when the explosive is used in soft or damp ground. The explosive formed of ammonium nitrate and the nitrated hydrocarbon is very abrupt in its action and when used in soft ground projects a small part of the ground outward violently. The explosive of the present invention overcomes these deleterious effects and at the same time retains all of the safety quality of the ammonium nitrate compound. The explosive is produced by mixing and incorporating together barium nitrate and trinitrotoluene. These ingredients, when combined, produce an explosive which is entirely satisfactory in regard to density, safety and non-hygroscopicity and by the proper proportioning of the amounts of each ingredient entering into the mixture an ex-

plosive having the desired properties may be obtained. The proportion of the ingredients which I have found preferable are:

Barium nitrate-----	70.71 parts	55
Trinitrotoluene-----	29.29 "	
	100.00 "	

This mixture or compound may be readily fired with a strong fulminating cap and when fired produces a pushing rather than a breaking effect and when used in soft ground will slightly lift and loosen a larger volume of ground instead of projecting a relatively small volume at a high velocity. I have found, however, that when a weak fulminating cap is used there is danger of mis-firing. This difficulty I overcome by mixing with the other ingredients a small percentage of a chromate and particularly lead chromate, which gives up its oxygen readily when in contact with oxidizable substances. This added element greatly increases the sensitiveness of the explosive to the action of the detonator thereby overcoming the liability of misfiring at the same time preserving the safety qualities of the explosive. The proportion of the ingredients which I have found preferable are:

Barium nitrate-----	69.30 parts	
Trinitrotoluene-----	28.70 "	
Lead chromate-----	2.00 "	
	100.00 "	85

I claim:

1. An explosive mixture composed of barium nitrate, trinitrotoluene and a small proportion of a chromate.

2. An explosive mixture composed exclusively of substantially 69.30 parts barium nitrate, 28.70 parts trinitrotoluene and 2.00 parts lead chromate.

In testimony whereof, I have hereunto set my hand at San Francisco, California, this 18th day of April 1912.

LOUIS G. M. ADINAU.

In presence of—

H. G. PROST,
P. S. PIDWELL.