UNITED STATES PATENT OFFICE.

RICHARD ESCALES, OF MUNICH-SCHWABING, GERMANY.

EXPLOSIVE COMPOUND.

No. 812,195. Specification of Letters Patent. Patented Feb. 13, 1906.

Application filed December 31, 1902. Serial No. 137,363.

To all whom it may concern:

Be it known that I, RICHARD ESCALES, doctor of philosophy, a subject of the German Emperor, residing at Munich-Schwabing, Germany, (whose post-office address is No. 5 Wilhelmstrasse, Munich-Schwabing, Germany,) have invented certain new and useful Improvements in Explosive Compositions, (for which I have applied for a patent in Germany on the 18th day of November, 1902, in Austria on the 20th day of November, 1902, and in Great Britain on the 20th day of November, 1902,) of which the following is a specification.

According to recent researches the disruptive power of explosives may be substantially enhanced by the admixture of finely-divided metals which are easily oxidizable and will consequently get oxidized at the expense of the oxygen contained in the explosive during the deflagration of the latter, which process is accompanied with considerable generation of heat. Further experiments have demonstrated that the physical structure of the metal has much influence on the degree of its action in the explosive composition and that a wooly condition—that is to say, the shape which metals possess in the recently-produced metal wool—is eminently adapted to enhance the dynamic energy or disruptive effect of explosives. These readily-combustible metal wools which, moreover, possess catalytic properties, an extraordinary degree of fineness, and consequently an enormous surface, produce an effect far superior to that obtainable from the same metals when they are in a state of fine division produced by ordinary mechanical disintegration or comminution of the metals in a compact condition. The oxygen or oxygen-carrier forming part of the explosive composition may be in the shape hitherto used for similar purposes.

Among the metals hitherto tested as addition to explosives aluminium (in the shape of aluminium wool) has been found eminently useful. The quantity depends, of course, upon the nature of the explosive and the especial effect desired and may in some cases amount to fifty per cent. of the quantity of the explosive employed. Hitherto the following three examples have given the best results:

I. Picric acid, eighty parts; aluminium wool, twenty parts.

II. Westfalite, eighty-five parts; aluminium wool, fifteen parts.

III. Carbonite, ninety parts; aluminium wool, ten parts.

The ingredients of Westfalite referred to consists of resin and ammonium nitrate and the ingredients of the carbonite referred to are nitroglycerin, kisselguhr, wood meal, and potassium nitrate.

The great superiority as regards its influence on the dynamic effect of explosives which metal wool possesses in comparison with the fine metallic powers hitherto employed for this purpose may be utilized in the manufacture of explosives, properly speaking, and also in the manufacture of priming compositions for percussion-caps and detonators.

Among the metals which may be used as admixtures in my improved explosive composition are, for instance, magnesium, aluminium, zinc, and iron.

What I claim is—

1. An explosive composition containing an oxygen-carrier and in addition an easily-oxidizable metal in the shape of metal wool for enhancing the dynamic effect of the said composition.

2. An explosive composition containing an oxygen-carrier and in addition aluminium wool for enhancing the dynamic effect of said composition.

3. An explosive composition consisting of Westfalite and aluminium wool, substantially as described.

4. An explosive composition containing ammonium nitrate and aluminium wool, substantially as described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

RICHARD ESCALES.

Witnesses:
H. KEINACH,
C. RATH.