

UNITED STATES PATENT OFFICE.

CHRISTOPHER F. MOHRIG, OF SAN FRANCISCO, CALIFORNIA.

EXPLOSIVE COMPOUND

SPECIFICATION forming part of Letters Patent No. 268,518, dated December 5, 1882.

Application filed August 9, 1881. (No specimens.)

To all whom it may concern:

Be it known that I, CHRISTOPHER F. MOHRIG, of the city and county of San Francisco, in the State of California, have invented certain new and useful Improvements in Explosive Compounds; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to that class of explosive compounds in the composition of which chlorate of potash enters as the principal ingredient or base. Such compounds, while possessing great energy, have the peculiar and dangerous property of exploding prematurely or accidentally when subject or exposed to friction or percussion, as from a jar or blow in handling and transportation; and from this cause their use in the arts is limited, and has been replaced by other compounds having less power, but being free from this tendency to explode prematurely or before being confined for action.

My improvement has for its object to produce a compound with chlorate of potash as the base in which great energy and powerful effect are combined with safety in handling, freedom from explosion by friction or percussion when not confined under pressure, and which is adapted to be used in close or confined situations, where the generation of unhealthy and dangerous vapors and odors would be an objection and prevent the employment of such explosives.

The invention will be understood as herein after set forth and claimed.

I mix and combine together the following ingredients in the usual manner of making such compounds, and with the assistance of any suitable apparatus known to those acquainted or familiar with the art: chlorate of potash, fifty to seventy parts; sugar, twelve to fifteen parts; charcoal, five parts; water, twenty-five to thirty parts. I grind these substances together and reduce them to a pulverulent condition. Into this mixture I then introduce black oxide of manganese, five parts; metallic zinc, ten to twenty parts, ground together and reduced. I then grind and mix the whole intimately together. To the mixture and compound I then add about ten (10) parts of wax by heating the compound to the temperature of boiling water and then combining the wax

by stirring and thoroughly incorporating it throughout the mass. For this purpose I employ yellow wax, beeswax, or vegetable wax. The degree of heat used should not be greater than necessary to render the wax soft and pliable, as its natural tenacity would be destroyed or impaired by increased heat.

This compound has great force. It is not liable to explode accidentally from friction or percussion. Its freedom from objectionable vapors and odors when used in confined places renders it of especial value in shafts, tunnels, and other close situations.

It is well known that the use of chlorate of potash as the chief ingredient in such compounds is attended with much danger from the fact that the particles of chlorate distributed among and throughout the other substances and ingredients are sensitive both to percussive force and to friction, and will readily ignite when subjected to any force of such character in handling or transportation; and in order to overcome, restrict, or remove this peculiar property, many modes and processes have been suggested, devised, and employed, so that this otherwise desirable explosive could be generally used with comparative safety. For this purpose soft, pliable, or semi-elastic substances have been employed for providing a soft or partly elastic coating or cushion to surround and envelop the chlorate particles, and thus isolate them from one another, and among them tarry and resinous substances have been employed with improved results. Such substances, however, while operating with good effect at first, gradually lose their soft and pliable nature or condition, and after a time become hardened or brittle under changes of temperature, and the compound with its supposed safe quality is rendered more dangerous than if the attempt to remove the tendency of the chlorate particles to ignite from friction and percussion had not been made. I find, however, in the use of wax, either in the form of yellow wax, beeswax, or vegetable wax, that I obtain a covering or coating medium for the chlorate particles that is not subject to deterioration after manufacture, but remains permanently soft and pliable. It has no tendency to harden or become brittle or to crumble and separate from the chlorate particles, and it is readily applied to and incorporated

with any chlorate compound. By the use of this ingredient I am enabled to give this class of explosives a quality of safety not attainable by the use of mineral substances, which, 5 possessing the required pliability at the time of manufacture, gradually part with it or change their character after combination with the compound.

Having thus described my invention, what I 10 claim, and desire to secure by Letters Patent, is—

As an improvement in chlorate-of-potash explosives, the herein-described compound,

consisting of the following ingredients, in about the proportions named, viz: chlorate of pot- 15 ash, sugar, charcoal, black oxide of manganese, metallic zinc, water, and wax in either of the forms of yellow wax, beeswax, or vegetable wax, in about the proportions set forth.

In witness whereof I have hereunto set my 20 hand and seal.

CHRISTOPHER F. MOHRIG. [L. S.]

Attest:

EDWARD E. OSBORN,
W. F. CLARK.