

UNITED STATES PATENT OFFICE.

HAMILTON SANBORN, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO GLOBE
CHEMICAL WORKS, OF SAN FRANCISCO, CALIFORNIA, A CORPORATION OF
CALIFORNIA.

FUME-DESTROYING COMPOSITION.

1,001,992.

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No Drawing.

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To all whom it may concern:

Be it known that I, HAMILTON SANBORN, citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented new and useful Improvements in Fume-Destroying Compositions, of which the following is a specification.

My invention relates to a fume-destroying composition.

The object of the invention is to provide a simple, cheap, practical means for destroying obnoxious and deleterious gases and fumes resulting from blasting.

The last ten years I have been engaged in experiments directed toward the discovery of a composition which, on being placed in a drill hole with dynamite or other nitro-explosive, would at the moment of explosion prevent the formation of those noxious gases known as powder gases. Analysis of the gases remaining after the explosion of the various nitro-glycerin preparations, add up to nearly one hundred per cent. without taking any account of these so called "powder gases" which must, therefore, be present in extremely small amounts. As far as has been determined, they consist of small amounts of nitrous gases and of unburned or partially burned nitro-glycerin. These powder gases are very deleterious in their effects on persons exposed to them, acting as a very violent heart stimulant, and producing severe nausea and headache, resulting in extreme cases even in loss of consciousness. Besides these more severe effects they also produce extremely disagreeable irritation of the eyes, nose and throat.

After the explosion of nitro-powders in mine tunnels or other subterranean places, it is impossible for men to return to work for several hours unless there is a very efficient forced ventilation, and even with the best ventilation possible the evil effects of the gases cannot be overcome. This is due mainly to the fact that considerable amounts of the noxious gases remain in the cavities of the rock and in the muck piles thrown down by the explosion. This gas is only slowly disengaged when these places are being picked over by the men and is usually present in quantities sufficient to cause great inconvenience. The evils due to powder gases are, therefore, two-fold: 1st.

They are a menace to the health of the men. 55
2nd. They enforce considerable period of idleness upon the men. It is toward the abatement of this nuisance that my experiments have been directed.

The composition, which I have discovered 60 consists of a mixture of ammonium carbonate and chlorid of lime in the proportions of about two parts of the former to one of the latter. I have found that these two active 65 agents act, when combined, to effectually destroy all deleterious and unpleasant effects of the powder gases resulting from the explosion. As far as I have been able to determine the chemistry of the operations in- 70 volved seems to be as follows:

1. The ammonium carbonate is a carrier of ammonia and possesses in the main the properties of free ammonia. Thus at the time of explosion free ammonia or its equiv- 75 alent is disseminated throughout the gases produced by the explosion, and seems to neutralize whatever nitric and nitrous vapors that may be present.

2. The chlorid of lime or bleaching powder 80 is a carrier of chlorin and for present purposes possesses substantially the properties of free chlorin. Thus at the time of the explosion there is also disseminated in the gases from the explosion free chlorin or its 85 equivalent which by its violent corrosive action destroys or renders harmless the small quantities of unburned or partially burned nitro-glycerin and like substances.

3. The fact that the ammonium carbonate 90 and the chlorid of lime may to some extent react before their dissemination in the powder gases does not materially alter the matter, as the products of such reaction are to be looked upon as the equivalent of the two 95 substances themselves. Chlorid of lime is advantageous on account of its cheapness and its stability as a chlorin carrier.

In practice a cartridge containing sixty- 100 five per cent. (65%) more or less of ammonium carbonate and thirty-five per cent. (35%) more or less of chlorid of lime made up into suitable working sized charges is placed into the blast hole with the dynamite or other nitro-explosive and the blast exploded in the usual way. Experience shows 105 that almost immediately thereafter the workmen may go back into the mine and

resume work, the air being perfectly sweet and fresh.

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

1. A fume destroying cartridge containing only ammonium carbonate and chlorid of lime.
2. A fume destroying cartridge contain-

ing approximately two parts of ammonium carbonate and one part of chlorid of lime.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HAMILTON SANBORN.

Witnesses:

CHAS. F. RYAN,
ALLEN L. CHICKERING.