

UNITED STATES PATENT OFFICE.

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SAFETY-POWDER FOR BLASTING.

994,273.

Specification of Letters Patent.

Patented June 6, 1911.

No Drawing.

Application filed February, 28, 1910. Serial No. 546,488.

To all whom it may concern:

Be it known that we, GERSHOM M. PETERS, of Cincinnati, county of Hamilton, State of Ohio, and MILTON F. LINDSLEY, of Kings Mills, county of Warren, State of Ohio, citizens of the United States, have invented certain new and useful Improvements in Safety-Powder for Blasting, of which the following is a full, clear, and exact specification.

This invention relates to new and useful improvements in safety powder for blasting purposes and is more particularly in the nature of an improvement on the safety powder described and claimed in our Patent No. 953,798, granted April 5, 1910. The formula in the said Letters Patent consists of nitrate of ammonia, nitro-cellulose, mirbane oil and asphalt in certain proportions which substances are thoroughly incorporated into a homogeneous mass. This powder has proved very effective but in a certain class of very dangerous mines it has been found that under some conditions the safety powder composed of these ingredients as described in the said Letters Patent may develop a degree of heat in explosion too great for absolute safety.

The primary object of the invention is therefore to produce a safety powder of the character described, which shall not develop in explosion a heat too great to secure absolute safety even in the most dangerous class of mines.

We have found that by the addition of chlorid of sodium, or common dry salt, to the combination of ingredients set forth in the claims of the said application for Letters Patent, we have been able to very greatly and effectively lower the degree of heat generated in explosion without seriously interfering with the explosive power of the safety powder. But we have found that unless the nitro-cellulose, which is one of the ingredients contained in the said formula, is absolutely neutral it may develop some acid under certain atmospheric conditions, which, in connection with the chlorid of sodium when added to lower the degree of heat developed in explosion, is liable to produce some decomposition or deterioration of the safety powder.

It is therefore found desirable and it is a further object to produce a safety powder

which shall contain chlorid of sodium for the purpose of lowering the degree of heat generated in explosion which at the same time may be protected against developing acid conditions liable to produce decomposition or deterioration. For this latter purpose we have found it desirable to introduce into the composition an antacid and prefer a small amount of carbonate of calcium which we have found quite sufficient to counteract any acid likely to arise.

While the ingredients named in our Letters Patent above referred to are being prepared by grinding and mixing as described, preparatory to being packed in water-proofed hermetically-sealed paper tubes or cartridges, the chlorid of sodium which we prefer to employ as the anti-caloric substance and the carbonate of calcium which we prefer to employ as the antacid, are thoroughly stirred in with the other ingredients so that the resulting mass is more or less homogeneous.

We find that in order to reduce the heat units sufficiently for absolute safety there should be incorporated into the mixture approximately twenty per cent., (20%), of the preferred anti-caloric, chlorid of sodium, and in order to counteract any tendencies to decomposition or deterioration about one per cent., (1%) of the preferred antacid, carbonate of calcium. We find that in order to produce the most satisfactory results our improved safety powder should consist of substantially sixty-seven per cent., (67%) of nitrate of ammonia, twenty per cent. (20%) of the anti-caloric substance, chlorid of sodium, ten per cent. (10%) of nitro-cellulose, preferably in the form of nitrated wood fiber, two per cent. (2%) of mirbane oil with asphalt held in solution, said solution preferably consisting of approximately four parts by weight of mirbane oil to one part by weight of asphalt and one per cent. (1%) of the preferred antacid, carbonate of calcium. It will be apparent, however, that changes in the proportions of the substances entering into our improved safety powder may be made by those skilled in the art without departing from the purpose and spirit of the invention and it is not desired to be limited to the exact combinations of ingredients enumerated nor to the exact proportions of the said ingredients named, but

What we claim and desire to secure by Letters Patent is—

1. A safety powder consisting of nitrate of ammonia, nitro-cellulose, a nitro-hydro-carbon solution of asphalt, an antacid, and a heat reducing substance.
2. A safety powder comprising nitrate of ammonia, nitro-cellulose, a nitro-hydro-carbon solution of asphalt, and chlorid of sodium.
3. A safety powder consisting of nitrate of ammonia, nitro-cellulose, a nitro-hydro-carbon solution of asphalt, chlorid of sodium, and an antacid.
4. A safety powder consisting of nitrate of ammonia, nitro-cellulose, a nitro-hydro-carbon solution of asphalt, carbonate of calcium and chlorid of sodium.
5. A safety powder consisting of nitrate of ammonia, nitrated wood fiber, a nitro-hydro-carbon solution of asphalt, an antacid, and a heat reducing substance.
6. A safety powder comprising nitrate of ammonia, nitrated wood fiber, a nitro-hydro-carbon solution of asphalt, and chlorid of sodium.
7. A safety powder consisting of nitrate of ammonia, nitrated wood fiber, a nitro-hydro-carbon solution of asphalt, chlorid of sodium, and an antacid.
8. A safety powder consisting of nitrate of ammonia, nitrated wood fiber, a nitro-hydro-carbon solution of asphalt, carbonate of calcium, and chlorid of sodium.
9. A safety powder consisting of nitrate of ammonia, nitro-cellulose, a mirbane oil solution of asphalt, an antacid, and a heat reducing substance.
10. A safety powder comprising nitrate of ammonia, nitro-cellulose, a mirbane oil solution of asphalt, and chlorid of sodium.
11. A safety powder consisting of nitrate of ammonia, nitro-cellulose, a mirbane oil solution of asphalt, chlorid of sodium, and an antacid.
12. A safety powder consisting of nitrate of ammonia, nitro-cellulose, a mirbane oil solution of asphalt, carbonate of calcium, and chlorid of sodium.
13. A safety powder consisting of a mixture of nitrate of ammonia, nitro-cellulose, mirbane oil, asphalt, an antacid, and a heat reducing substance.
14. A safety powder comprising a mixture of nitrate of ammonia, nitro-cellulose, mirbane oil, asphalt, and chlorid of sodium.
15. A safety powder consisting of a mixture of nitrate of ammonia, nitro-cellulose, mirbane oil, asphalt, chlorid of sodium, and an antacid.
16. A safety powder consisting of a mixture of nitrate of ammonia, nitro-cellulose, mirbane oil, asphalt, carbonate of calcium, and chlorid of sodium.
17. A safety powder consisting of nitrate of ammonia, nitrated wood fiber, mirbane oil, asphalt, an antacid, and a heat reducing substance.
18. A safety powder comprising nitrate of ammonia, nitrated wood fiber, mirbane oil, asphalt, and chlorid of sodium.
19. A safety powder consisting of nitrate of ammonia, nitrated wood fiber, mirbane oil, asphalt, chlorid of sodium, and an antacid.
20. A safety powder consisting of nitrate of ammonia, nitrated wood fiber, mirbane oil, asphalt, carbonate of calcium, and chlorid of sodium.
21. A safety powder comprising nitrate of ammonia, nitrated wood fiber, mirbane oil, asphalt, and chlorid of sodium, all incorporated into a homogeneous mass.
22. A safety powder consisting of nitrate of ammonia, nitrated wood fiber, mirbane oil, asphalt, carbonate of calcium, and chlorid of sodium, all incorporated into a homogeneous mass.
23. A safety powder consisting of nitrate of ammonia, nitro-cellulose, mirbane oil, asphalt, carbonate of calcium, and chlorid of sodium, all incorporated into a homogeneous mass.
24. A safety powder consisting of nitrate of ammonia, nitrated wood fiber, mirbane oil containing asphalt in solution, chlorid of sodium, and carbonate of calcium.
25. A safety powder comprising the following ingredients and in substantially the following proportions: nitrate of ammonia, sixty-seven (67) per cent., chlorid of sodium twenty (20) per cent., nitro-cellulose, ten (10) per cent., mirbane oil with asphalt held in solution, two (2) per cent., and carbonate of calcium one (1) per cent.
26. A safety powder comprising the following ingredients, incorporated into a homogeneous mass in substantially the following proportions: nitrate of ammonia sixty-seven (67) per cent., chlorid of sodium twenty (20) per cent., nitro-cellulose ten (10) per cent., mirbane oil with asphalt held in solution two (2) per cent., and carbonate of calcium one (1) per cent.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, on this 22d day of February A. D. 1910.

GERSHOM MOORE PETERS.
MILTON FLETCHER LINDSLEY.

Witnesses:

B. B. TUTTLE,
E. PETERS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."