UNITED STATES PATENT OFFICE.

MAX TSCHIRNER, OF SAN FRANCISCO, CALIFORNIA.

EXPLOSIVE COMPOUND.

SPECIFICATION forming part of Letters Patent No. 232,381, dated September 21, 1880.

Application filed May 18, 1880. (No specimens.)

To all whom it may concern:

Be it known that I, MAX TSCHIRNER, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have discovered a new and useful Explosive Compound, of which the following is a specification.

The base of my compound is composed of picric acid. This in itself is not explosive; but by the addition of other substances or ingredients which easily yield oxygen—such as chlorates, perchlorates, nitrates, manganates, and permanganates, or other fusible chlorates which yield oxygen by decomposition—the carbon of the picric acid is changed or transformed all at once into carbonic acid, and the explosion effected instantaneously and with great effect; hence my invention or discovery consists in the combination of picric acid with an oxidizing agent, of which elements or ingredients I prefer chlorate of potash, as this chemical is generally to be had in large quantities and at a reasonable price.

The proportion of the above ingredients will vary according to the effect desired, the picric acid being, however, always a base, or in excess of the chlorate of potash or other oxidizing agent.

The following formula of one hundred (100) parts will be sufficiently explicit to enable those skilled in the art to manufacture my explosive compound, to wit:

Fifty-seven (57) parts of picric acid and forty-three (43) parts of chlorate of potash will give seventy-four and eight-tenths ($74\frac{8}{10}$) per cent. of explosive force.

The relative proportions of the above ingredients may, of course, be varied within a suitable range according to the effect desired, as the larger the quantity of picric acid employed the greater will be the explosive force of the compound.

The process of manufacturing my explosive compound is as follows, to wit: The ingredients are first reduced to a fine powder by a separate trituration, after which they are well incorporated together, with the addition of about five (5) per cent. of pulverized rosin. I then sprinkle the product with a sufficient quantity of benzine, kerosene-oil, or other fluid to moisten it, which will readily dissolve the rosin and pass off quickly during the operation of stirring the mass, which agitation should be constantly kept up, or until the evaporation of the benzine takes place and the compound becomes a plastic mass easily molded. I then press it into cartridges of sufficient size by packing it in molds or cylinders. By this means, also, the cartridge is rendered impervious to the action of wet or moisture, the rosin and benzine or coal-oil forming a coating or protection which enables me to explode the cartridge under water.

The value of my invention or discovery is evinced in and by the following statement—that is to say, the uniting of only two ingredients which, in themselves or taken separately, are inexplosive, and when so united or compounded will explode with great force and effect only by means of fire or a very strong percussion, such as a percussion-cap.

The compound is not dangerous to manufacture or handle at a temperature less than that of 212° Fahrenheit, and, furthermore, it will not be affected by cold, like nitro-glycerine, and, lastly, in exploding, the presence of noxious or injurious gases is not to be found, which latter fact makes my compound more desirable for mining purposes or underground work than other high explosives.

I am aware that picric acid has been used in the manufacture of explosive compounds by impregnating sawdust with about two (2) per cent. of picric acid and two (2) per cent. of nitrate of potash in solution, to which were afterward added other gas producing and earthy substances. I am also aware that the picrates and chlorate of potash have been used in the manufacture of explosive compounds. These, however, I do not claim; but

What I claim as my invention or discovery is—

The explosive compound herein described, consisting of picric acid and chlorate of potash, in about the proportions specified.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 4th day of May, 1880.

MAX TSCHIRNER. [L. S.]

Witnesses:

C. W. M. SMITH,

W. P. COLEMAN.