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DYNAMITE COMPOSITION.

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This invention relates to dynamite compositions, and consists essentially in the use of balsa wood as a new absorbent material for the liquid high explosive component of dynamite.

In an ordinary dynamite containing nitroglycerine, the material used to absorb nitroglycerine will depend upon the percentage of nitroglycerine in the explosive. Thus, for example, a so-called straight dynamite containing 60% of nitroglycerine usually contains approximately 18% of wood flour or wood pulp, whereas a dynamite containing 40% nitroglycerine may contain about 10% of wood flour or wood pulp, and a dynamite containing 20% of nitroglycerine may be made without any wood flour or wood pulp at all, the other ingredients such as sodium nitrate, corn meal, flour, etc., having sufficient power of absorption to retain the nitroglycerine without the latter exuding from the dynamite.

I have discovered that dynamites having new and distinctive properties may be obtained by using finely divided balsa wood as the chief absorbent material for the nitroglycerine or other liquid high explosive constituent. My invention contemplates the use of balsa wood, prepared in a way to be described below, in place of all or a part of the wood pulp or wood flour ordinarily used. Balsa wood (*Ochroma lagopus*) is a tropical wood which is distinctive in that it has a very low specific gravity. Commercial balsa wood has a specific gravity of from 0.115–0.130. The reason for this extreme lightness is its loose structure and the softness of its tissue. I have found that if balsa wood is subjected to the ordinary procedure in manufacturing wood flour, such as grinding in suitable mills, for example buhrstone mills or other suitable attrition mills, the wood pulp or wood flour so produced retains the lightness of the original wood and provides a very satisfactory absorbent for nitroglycerine. Because of the extreme lightness of the wood flour or wood pulp so produced, a given weight will absorb a higher percentage of nitroglycerine than will wood pulp or wood flour made from ordinary wood, such as spruce, fir, pine, etc. By taking advantage of this fact, I can produce a 60% dynamite containing a lower percentage of wood pulp or wood flour than is ordinarily used when wood pulp or wood flour made from ordinary northern woods is employed. Thus, for example, a 60% dynamite can be made with from 12–15% of wood flour made from balsa wood as compared with 20% of wood pulp or wood flour made from ordinary northern woods.

I have also discovered that sawdust produced as a waste product of balsa wood by the ordinary methods of wood working may be used to great advantage in dynamite compositions where the percentage of nitroglycerine is not high, and where a low density explosive is desired. Thus, for example, in explosives of the permissible type such as are used in coal mines, it is sometimes desirable to use a very low density explosive. The explosives now in use ordinarily have a density corresponding to a weight of 160–180 grams for a cartridge 1¼″ in diameter by 8″ long. By the use of a specially high grade wood flour or wood pulp, it is possible to obtain a density corresponding to a weight of about 145 grams for a cartridge 1¼″ in diameter by 8″ long. I have discovered that by using sawdust made from balsa wood, I can produce a permissible explosive having a density corresponding to a weight of approximately 125 grams for a cartridge 1¼″ in diameter by 8″ long. The sawdust for use in compositions of this type may vary within quite wide limits as to fineness. That which I have found to be most suitable is of such a fineness that none is held on a 10 mesh screen and from 10–30% passes a 40 mesh screen. Similar results can be obtained, using wood flour or wood pulp made from balsa wood. As an example of such an explosive, I cite the following:

	Per cent.
Nitroglycerine	10
Ammonium nitrate	75
Sodium nitrate	5
Balsa wood sawdust	10

It will, of course, be understood that I may vary this composition greatly without departing from the spirit of the invention. Thus, for example, I may use tetranitrodiglycerine in place of nitroglycerine in order to make the explosive low freezing, or I may omit sodium nitrate entirely or increase its percentage appreciably. Instead of sodium

nitrate, I may use sodium chloride or I may use any of the well-known methods for depressing the temperature of the flame in order to secure an explosive which will be safe to use in dusty and gaseous coal mines. For a portion of the balsa wood, I may substitute other carbonaceous materials, such as corn meal, ivory nut meal, flour, etc.

The most important ranges of proportions may be indicated as follows (for permissible explosives):

		Per cent.
Nitroglycerine	from	7–15
Ammonium nitrate	from	40–85
Sodium nitrate	from	0–20
Sodium chloride	from	0–20
Balsa wood pulp or flour	from	5–15

I claim:

1. An explosive composition characterized by its low density and comprising from about 7 to 15% of a normally liquid high explosive, from about 5 to 15% of finely divided balsa wood, and ammonium nitrate.

2. An explosive composition characterized by its low density and comprising from about 7 to 15% of a normally liquid high explosive, from about 5 to 15% of finely divided balsa wood, from 40 to 85% of ammonium nitrate, and a salt adapted to reduce the flame temperature upon explosion of the composition.

3. An explosive composition characterized by its low density and comprising from about 7 to 15% of nitroglycerine, from about 5 to 15% of finely divided balsa wood, and ammonium nitrate.

4. An explosive composition characterized by its low density and comprising about 10% of nitroglycerine, about 75% of ammonium nitrate, about 5% of sodium nitrate, and about 10% of finely divided balsa wood.

In testimony whereof I affix my signature.

WENDELL R. SWINT.