

# UNITED STATES PATENT OFFICE.

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## IGNITING COMPOSITION FOR MATCHES.

No. 930,570.

Specification of Letters Patent.

Patented Aug. 10, 1909.

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*To all whom it may concern:*

Be it known that I, LOUIS STANGE, a subject of the German Empire, residing at Aachen, in the Empire of Germany, have invented certain new and useful Improvements in Igniting Compositions for Matches, of which the following is a specification.

This invention relates to improvements in the manufacture of matches and igniting surfaces therefor, the object being to produce compositions for mechanically igniting material and for igniting surfaces for safety matches, without the use of phosphorus.

In manufacturing ordinary friction-igniting matches it is customary to use phosphorus or its compounds with sulfur as igniting agents; in the same way, in producing igniting surfaces for safety matches, amorphous phosphorus is used in the composition.

This invention consists in the employment of certain diazo compounds as a substitute for phosphorus and its compounds in compositions either for friction igniting matches or for producing friction surfaces for safety matches. The explosive and combustible properties of some diazo compounds are already known and hitherto it has been suggested to employ such compounds in percussion caps and fuses, but it is now found that phosphorus and its compounds with sulfur in igniting compositions, and amorphous phosphorus in igniting surfaces for safety matches, can be effectively replaced by certain non-poisonous stable diazo compounds such as anhydrous diazobenzenesulfonic acid, provided all the ingredients, including the diazo compounds, are employed in a neutral state in the absence of any metals or metallic salts.

A diazo compound which can be employed according to this invention must fulfil the following conditions:—(1.) It must be a stable compound which does not possess too high a molecular weight. (2.) It must not be easily soluble in water. (3.) It must be obtainable in a solid state, perfectly free from metallic salts and perfectly free from acid; for any adherent acid would destroy the glue which is the only practical adhesive ingredient for match-heads. (4.) It must be capable of igniting by friction when mixed with the agents usually employed with phosphorus in the manufacture of match-heads. It can readily be determined by preliminary tests whether or not a particular diazo com-

pound will serve the purposes of this invention.

It is found that the cheapest and most useful representative of the whole series for this purpose is anhydrous diazobenzenesulfonic acid.

The following is an example of a composition suitable for the production of match-heads and embodying this invention:—

### Example I.

45	parts by weight of chlorate of potassium.	70
15	" " " " powdered glass.	
15	" " " " sulfur.	
3	" " " " antimony sulfid.	75
10	" " " " glue.	
12	" " " " anhydrous diazobenzenesulfonic acid	80
50	" " " " water.	
Yielding 150	" " " " igniting composition.	85

In manufacturing a paint or coating for producing igniting surfaces for safety matches, the following composition may, for example, be employed.

### Example II.

20	parts by weight of powdered glass.	
20	" " " " antimony sulfid.	95
40	" " " " anhydrous diazobenzenesulfonic acid.	100
10	" " " " gum arabic.	
60	" " " " water.	
Yielding 150	" " " " composition for painting the friction surfaces of safety match-boxes and the like.	105

In view of the nature of the diazo compounds, the temperature of the mass during the processes of mixing grinding, dipping, etc. must be kept below 80° F. and the drying rooms for matches produced by this

process must also be maintained below this temperature. Matches manufactured with these precautions, when perfectly dry, can withstand any temperature up to 160° F. and do not absorb moisture when exposed to a damp atmosphere.

It is to be understood that I do not confine myself to the ingredients mentioned as additions to the diazo compounds or to the proportions in which they are mixed, as known alternatives to these additional substances may be used without departing from this invention.

What I claim as my invention and desire to secure by Letters Patent is:—

1. The herein described igniting composition for matches comprising a solid inorganic oxidizing salt, powdered glass, sulfur, antimony sulfid, glue, and diazo-benzene sulfonic acid.

2. The herein described igniting composition for matches comprising a solid inorganic oxidizing salt, powdered glass, sulfur,

antimony sulfid, glue, and anhydrous diazo-benzene sulfonic acid. 25

3. The herein-described igniting composition for matches comprising chlorate of potassium, powdered glass, sulfur antimony sulfid, glue, anhydrous diazo-benzenesulfonic acid and water in substantially the described proportions. 30

4. The herein-described igniting composition for matches comprising 45 parts by weight of chlorate of potassium, 15 parts by weight of powdered glass, 15 parts by weight of sulfur, 3 parts by weight of antimony sulfid, 10 parts by weight of glue, 12 parts by weight of anhydrous diazo-benzenesulfonic acid and 50 parts by weight of water. 35

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses. 40

LOUIS STANGE.

Witnesses:

WILLIAM J. REUTERS,  
HENRY QUADFLIEG.