W. M. BURTON.

MATCH.

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1,019,756.

Patented Mar. 12, 1912

Fig. 1

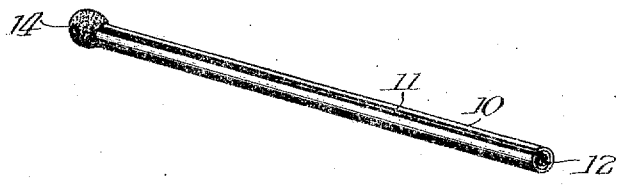

Fig. 2

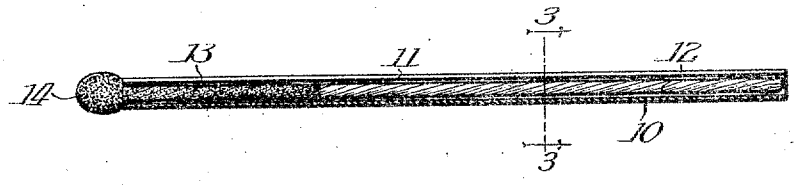

Fig. 3

Witnesses:
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UNITED STATES PATENT OFFICE.

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MATCH.

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To all whom it may concern:

Be it known that I, WILLIAM M. BURTON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Matches, of which the following is a specification.

My invention relates to improvements in matches, and more particularly concerns, but not exclusively, what may be termed metal matches, or, more explicitly, matches with metal shanks or bodies. Matches of this character have the advantage of not smoldering like wooden ones, and consequently there is less likelihood of accidentally starting destructive fires, and, furthermore, the stock and machinery for the manufacture of such matches occupy much less space than those required for the ordinary ones having wooden or similar shanks.

Other features of improvement will be made apparent to those skilled in this art from an understanding of the invention set forth in detail below.

In order that a full and complete understanding of this invention may be had, I have illustrated a preferred and desirable embodiment of the same in the accompanying drawing, which forms a part of this specification, and to which reference should be made for a full comprehension of the construction and advantages of matches embodying these improvements.

In this drawing,—Figure 1 is a perspective view, on an enlarged scale, of one of these new matches; Fig. 2 is a longitudinal central section of the match on a larger scale; and Fig. 3 is a cross section through the shank of the match, on line 3—3 of Fig. 2.

The shank or body 10 of the match consists of a sheet-metal tube or shell of suitable length and shape and dimensions of cross section, such tube or shell being opened at 11 on one side throughout its entire length, the tube inclosing a strand or filler 12 of vegetable, animal or mineral fiber. As shown in the drawing, this strand or fibrous filler is of substantially the same length as the surrounding or incasing metal shell or tube, and the filler is made fibrous or porous so that it may be impregnated with a combustible material, such, for example, as paraffin wax, the impregnation being preferably throughout a portion only of the length of the fiber, ordinarily not more than one third of its length at the head end of the match, as shown at 13. As is customary, the article has an ignitible head 14, which ignites the paraffin or other similar impregnating material 13, the head being ignited, as is customary, by friction on any suitable surface. The preferred construction of the fiber filler or cord consists of jute, hemp or flax material, and an end portion of the same is impregnated or charged with paraffin wax containing about ten per cent. of a high fire-test burning oil made from petroleum, such, for example, as the so-called mineral seal oil sold for railway use.

One desirable method of manufacturing these matches consists in drawing a thin, narrow ribbon or strip of suitable metal, together with a strand or cord of suitable fiber, through a die in such a manner that the metal is folded or rolled over into substantially cylindrical form which incases the fiber and incloses it over its entire length. The adjacent longitudinal edges of the metal, however, are not brought directly together, but are separated slightly to provide the slot 11, the function of which is described hereinafter. As the metal and the associated fiber filler are formed into the folded element of continuous length, it is cut into sections of suitable lengths for the shanks of matches. It is desirable to have the fiber inclosed in the whole length of the metal, since the fiber absorbs a portion of the heat and prevents a portion thereof from being transmitted to the fingers of the person holding the match when it is being burned. After these shanks have been made in this manner, one end of each is dipped for a suitable length of time in the melted paraffin wax, so that the filler becomes impregnated for the proper length, ordinarily not over one third the total length of the match, and then the match is supplied in any approved manner with an ignitible head of suitable character.

It has been stated that the fiber is impregnated with the combustible paraffin for a distance not exceeding one third of its length beginning at the head of the match, and it should be noted that if the fiber is impregnated or charged with the combustible wax or paraffin throughout its entire length, the material melts ahead of the flame and runs out, following the match stem or shank to the fingers of the person holding it, soiling the fingers, with the pos-

sibility of burning them before the wax is consumed. Consequently, a limited quantity only of paraffin is used, but a match of this kind will burn longer than an ordinary wooden match, the wax only, aside from the head, being consumed, the filler or fibrous strand being unburned. The slot along the side of the match stem is ordinarily quite narrow, being not more than a sixty-fourth of an inch, and by means of this surrounding shell or tube the fiber is protected from the air, so that it cannot burn, the wax being distilled by the heat of the flame into gas, which passes out through the slot and burns as it reaches the air.

Matches with longitudinally folded metal shanks have heretofore been proposed, and the present invention is an improvement on that style of match, because it is difficult to provide a match of this kind with an ignitible head which of itself will burn sufficiently long for ordinary purposes. Therefore I combine with the head a suitable quantity of combustible material within the metal shank, and which the head sets on fire after ignition.

I believe that I am the first person to provide a match having a non-combustible shell or casing containing within it a combustible material ignitible by the match head.

While I have herein described only the preferred embodiment of the invention, I wish to have it understood that it is susceptible of a variety of embodiments, and that many minor changes, both of a mechanical and chemical nature, may be made in the match herein described without departure from the substance and essence of the invention and without the sacrifice of any substantial benefits and advantages.

I claim:

1. In a match, the combination of an ignitible head, and a shank composed of a non-combustible outer shell open on a side at least for a portion of its length and a combustible material in said shell, substantially as described.

2. In a match, the combination of an ignitible head, and a shank composed of a substantially-non-combustible metal outer shell open on a side at least for a portion of its length and a combustible material in said shell, substantially as described.

3. In a match, the combination of an ignitible head, and a shank composed of a substantially-non-combustible metal outer shell open on a side and a combustible material in said shell, substantially as described.

4. In a match, the combination of an ignitible head, and a shank having a non-combustible outer shell open on a side at least for a portion of its length and a fibrous filler in said shell impregnated with a combustible material, substantially as described.

5. In a match, the combination of an ignitible head, and a shank having a substantially-non-combustible metal outer shell open on a side at least for a portion of its length and inclosing a fibrous material impregnated with a combustible material, substantially as described.

6. In a match, the combination of an ignitible head, and a shank composed of a substantially-non-combustible metal shell open on a side and containing a fibrous material impregnated with a combustible material, substantially as described.

7. In a match, the combination of an ignitible head, and a shank composed of a substantially-non-combustible metal shell open its entire length on one side and containing a fibrous filler extended substantially the full length of the shell, said filler being impregnated with a combustible material for a portion only of its length, substantially as described.

8. In a match, the combination of an ignitible head, and a shank composed of a non-combustible shell open on a side at least for a portion of its length and inclosing a fibrous filler impregnated with paraffin, substantially as described.

9. In a match, the combination of an ignitible head, and a shank composed of a substantially-non-combustible metal shell open on a side and inclosing a fibrous filler impregnated with paraffin, substantially as described.

10. In a match, the combination of an ignitible head, and a shank composed of a substantially-non-combustible metal shell open on a side and inclosing a fibrous filler of substantially the same length as the shell and impregnated with paraffin for a portion only of its length, substantially as described.

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Witnesses:
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