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J. CAGE

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FIRE-PROOF SHIPPING CONTAINER

Original Filed April 24, 1937

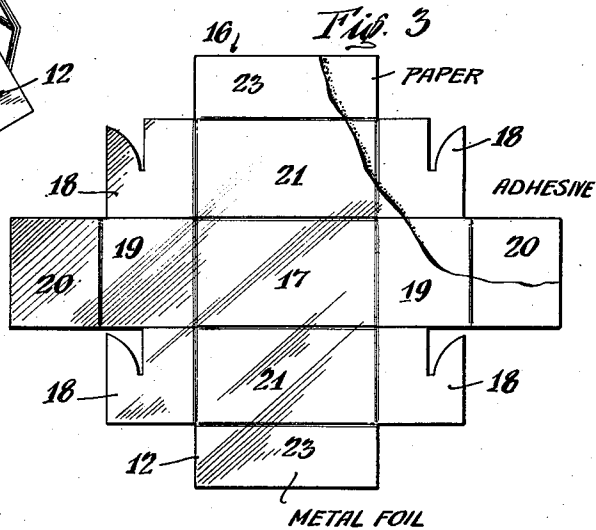
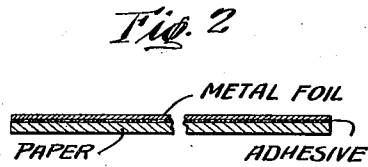
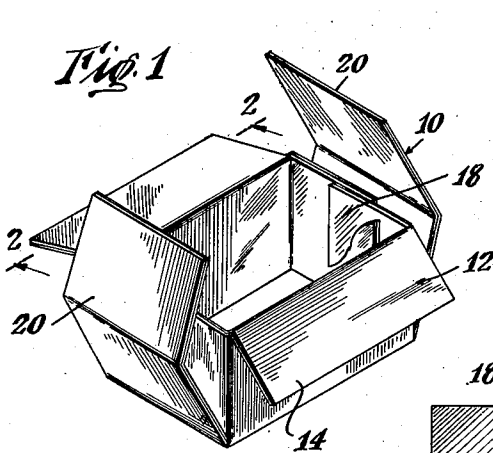
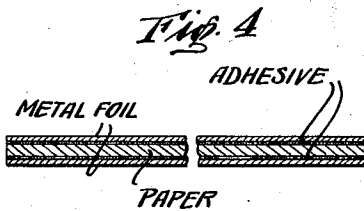
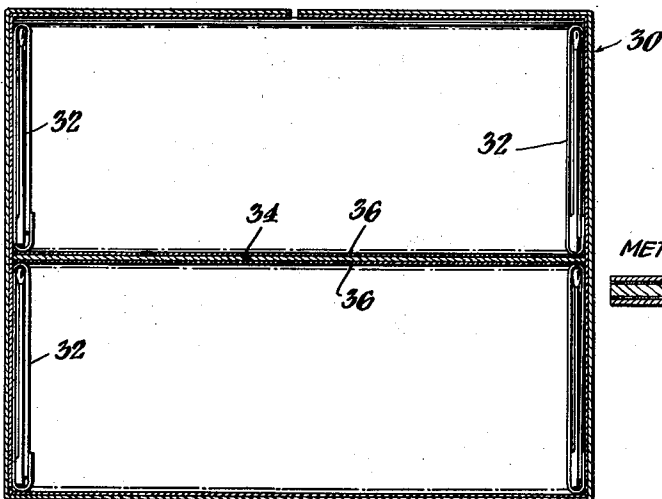


Fig. 5



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FIREPROOF SHIPPING CONTAINER

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Original application April 24, 1937, Serial No.
138,703, now Patent No. 2,189,055, dated February
6, 1940. Divided and this application Feb-
ruary 3, 1940, Serial No. 317,043

2 Claims. (Cl. 206—46)

This invention relates to shipping containers of a type adapted to transmit in the mails safety matches of the box or small book type. This application is a division of my patent application Serial No. 138,703 filed April 24, 1937 for "Book match shipping container" which application has resulted in Patent No. 2,189,055 dated February 6, 1940.

Heretofore it has not been considered feasible to ship safety matches, which are of course highly inflammable, in the mails except when encased in strong metal containers. As a result, manufacturers of the small book type of safety matches which are used extensively for advertising purposes have found it impossible to mail separate books of safety matches to individuals, because of the prohibitive cost entailed in obtaining the metal shipping containers. Any shipping container for matches which could be substituted for strong rigid containers to be acceptable to the postal authorities had to be sufficiently strong so as not to be broken or torn easily and also had to be relatively fireproof so as to guard the readily inflammable matches.

Therefore it is an object of my invention to provide a paper or cardboard metal foil-lined shipping container of a type sufficiently strong to ship one or more books of safety matches, having sufficient strength to adequately protect the matches contained therein and to be sufficiently fireproof so that there is little risk of fire being transmitted from or to the matches being shipped.

It is a further object of my invention to provide a metal foil of sufficient thermal conductivity as a liner for such containers so that if the matches accidentally are ignited the metal foil lining of the container dissipates the heat generated by the match heads rapidly.

A further object of my invention is the provision of such a metal foil lining which has such a high thermal conductivity that when the container is subjected to heat from outside sources, in any one area upon the container, the foil lining is adapted to promptly conduct such heat away from the particular area of the container subjected to the said heat.

A further object of my invention is to have the metal foil lining of the container coextensive with all internal surfaces thereof and to have such foil lining preferably in one piece, this latter object being attained by forming the foil-lined match box shipping container from a one-piece blank of laminated paper and metal foil.

A further object of my invention is to provide

a metal foil-lined shipping container for matches which is designed to tightly accommodate the book or books of matches it is wished to ship; the reason being that as little air as possible should be present in the shipping container.

A further object of my invention is the provision of foil-faced separators for shipping containers in which a number of book matches are shipped in order to attain the safety margin afforded thereby.

It will be recognized since lead, tin or zinc metal foils have such a low thermal conductivity, namely, .08, .15 and .26 respectively, calories per centimeter cube degree centigrade at room temperature, that they would not serve as satisfactory linings for fireproof shipping containers for matches; also these metals do not possess the required tensile strength. I have found that aluminum foil, which has a thermal conductivity of .48 calories per centimeter cube per degree centigrade at room temperature, satisfactorily serves as a liner both because of its high thermal conductivity and also because it has a high tensile strength. Copper foil also serves well as a lining. I have found that foils of less than .00035" thick do not possess the tensile strength nor do they have sufficient body to conduct the heat away from any specific area either within or without the shipping container.

The above and various other objects and advantages will be readily understood from the following description taken in connection with the accompanying drawing of preferred embodiments of the invention, in which modifications may be made without departing from the scope of the appended claims.

In the drawing—

Fig. 1 is a perspective view of a foil-lined shipping container for a plurality of books of matches;

Fig. 2 is a section taken on the line 2—2 of Fig. 1;

Fig. 3 is the blank from which the container is formed;

Fig. 4 is a section similar to Fig. 2 except that it illustrates a modified type of stock which is metal faced on both sides;

Fig. 5 is a vertical cross section of a shipping container of the type shown in Fig. 1 showing books of matches packed therein with a foil faced separator between the two adjacent rows of matches.

In Figs. 1 to 3 a shipping container 10 of the usual box form is formed of cardboard preferably .015" thick (15 point), covered with alumi-

num foil lining 12 preferably at least .0004" thick, upon its inner surface 14. In order that the foil lining may be continuous without gaps and so that no portion of the container 10 is unprotected, the container will ordinarily be formed of a one-piece box blank 16 as indicated in Fig. 3. Such box blank has a bottom 17, and contiguous to said bottom the blank is provided with interlocking and cooperating end portions 18, end wall portion 19 and top flap portions 20 contiguous with the end walls 19. These flaps 20 may be of such length as to overlap each other or abut the center as shown. The sides 21 of the container are contiguous with top flaps 23 and adapted to overlie or underlie the flaps 20 as desired. Therefore it will be noted that when the container is closed, all inner walls or surfaces of the container are fully and completely lined with a continuous lining of metal foil. It will be obvious that the shape of the container 10 should be such that when closed and packed with matches it closely encompasses the matches which are contained therein. In other words, tight packing with the resultant lessening of air, is important.

In Fig. 4 a fragmentary cross sectional view of sheet stock is shown which is suitable for forming the shipping container lined both on the inner and outer surfaces with aluminum foil, resulting in the ready dispersion of heat from any specifically heated part of the box either inside or out, because of the thermal conductivity of the aluminum foil.

In Fig. 5 is illustrated a cross section of a box 30, generally similar to that illustrated in Figs. 1 to 3 except that Fig. 5 is suitable for packing two rows of matches indicated as 32 with a separator sheet 34 having foil layers 36 on both its top and bottom surfaces and adapted to sepa-

rate the two layers of matches, thus definitely fireproofing the two layers one from the other in the event of accidental ignition of a book or a row of books. This type of packing also provides for a minimum of air space inside the container.

It is to be understood that while the illustrated forms of the invention which I have described represent certain preferred embodiments, I do not wish to limit myself precisely to the details as shown, since it is obvious that the same may be considerably varied without departing from the spirit of the invention as defined and claimed in the appended claims; it is obvious that various types and forms of papers and certain selected metals having the characteristics of aluminum or copper could be utilized in a similar manner.

I claim:

1. In combination a foil-lined shipping container for books of matches, a plurality of books of matches therein in two or more layers, and a fire resistant separator between said layers of books of matches, said shipping container being lined continuously with metal foil of relatively high tensile strength and relatively high heat conductivity, and said separator being comprised of paper faced with metal foil on both sides whereby when any specific localized area of the envelope is subjected to heat, the metal foil lining is adapted to rapidly conduct heat away from said specific area.

2. The combination as defined in claim 1 wherein the foil lining of said container is aluminum foil at least .00035" thick and the foil facings of said separator comprise aluminum foil at least .00035" thick.

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