H. H. ROBERTSON.

PROTECTED METAL ARTICLE.

APPLICATION FILED JUNE 3, 1916.

1,277,755. Patented Sept. 3, 1918.

Fig. 1.

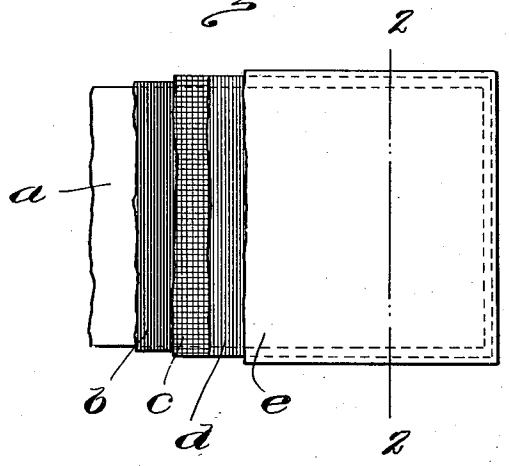


Fig. 2.

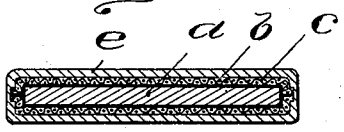


Fig. 3.

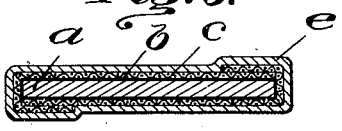
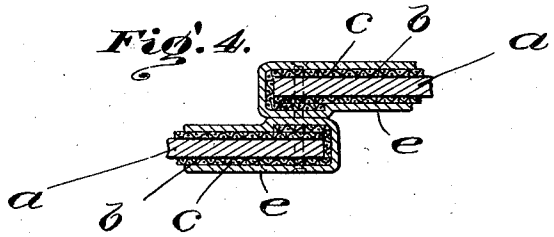


Fig. 4.



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PROTECTED METAL ARTICLE.

1,277,755. Specification of Letters Patent. Patented Sept. 3, 1918.

Application filed June 3, 1916. Serial No. 101,634.

To all whom it may concern:

Be it known that I, HAROLD H. ROBERTSON, a subject of the King of Great Britain, and a resident of Sewickley, in the county of Allegheny and State of Pennsylvania, have invented an Improvement in Protected Metal Articles, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to a protected metal article. The protected article when in the form of a layer or sheet is especially adapted among other uses to be employed as a roofing or siding material in the construction of buildings, and the invention has for its object to provide a superior article for this purpose, which is capable of withstanding for a substantially long time, the action of fumes, gases and climatic changes.

The metal article, such as an iron or steel sheet is provided on its sides and edges with a primary protective coating of plastic or fluid adhesive material, which may be asphalt having a relatively high melting point, which in turn is protected from extraneous influences by means of layers of fibrous material, such as asbestoes paper or felt and the like, which latter is saturated with plastic or fluid adhesive material, which may be asphalt having a relatively low melting point, which unites with the primary protective coating, and said metal sheet and its protective coatings will be further protected by providing the saturated fibrous layers with a layer of fluid or plastic hydrocarbonaceous material of substantial thickness or body in which the protected metal sheet is incased, and which serves as a sealing layer for the volatile constituents of the saturating material for the fibrous layer and which is preferably asphalt of relatively high melting point mixed or tempered with other materials and capable of uniting with the saturating material, as will be described.

The particular features of this invention will be pointed out in the claims at the end of this specification.

Figure 1 is a plan view with parts broken away of a protected metal sheet embodying this invention.

Fig. 2, a section on the line 2—2, Fig. 1.

Fig. 3, a section of a modified form of protected metal sheet, and

Fig. 4, a section of two overlapping sheets to illustrate the bonding of the sheets and the sealing of the joint between them.

Referring to the drawings, *a* represents a metal sheet, preferably of iron or steel, which is provided on its opposite surfaces and edges with a primary protective coating *b* of adhesive material, preferably asphalt having a relatively high melting point, such, for instance, as 220° to 250° F., which has a relatively hard and firm consistency and affords a substantial protection against rust and the action of gases and fumes.

The metal sheet *a* coated with the protective asphalt layer *b*, is further protected by layers *c* of fibrous material, such as asbestos paper or felt or the like, which are saturated with fluid or plastic material, preferably asphalt having a relatively low melting point and substantially thin and fluid, so that it can penetrate readily into the fibrous sheets or layers. This saturating material, marked "d" in Fig. 1, may be a straight asphalt having a relatively low melting point, such as 110° F., or a combination of hard or high melting point asphalt with an asphalt flux in suitable proportions to give an asphalt having a relatively low melting point.

The asbestos or felt sheet or layer *c* is saturated with the relatively low melting point asphalt before it is affixed to the metal sheet having the coating *b* of asphalt of relatively high melting point, and said coated metal sheet may be fed between the layers *c* of saturated fabric while the asphalt on the metal sheet is in a plastic or fluid condition, after the manner represented in U. S. Patent No. 1,002,303, dated September 5, 1911, or in any other suitable or desired manner.

The coated metal sheet with the protective layers of saturated fabric may be allowed to cool and are preferably cut up into individual protected metal sheets. The sheets thus produced afford protection for the metal sheet against the action of the weather and gases or fumes a certain length of time, but inasmuch as the asphalt of the relatively low melting point with which the asbestos or other fabric is saturated, contains more or less volatile constituents, in

order to impart to it the property of readily penetrating into the asbestos or other fabric so as to saturate the same, such saturating material deteriorates more or less, when exposed to sunlight, moisture and certain gases and fumes, and allows the asbestos or other fabric to absorb moisture, and fumes or gases, which latter in time may affect the primary protective coating on the metal sheet, and cause the efficiency of this primary coating as a protection against corrosion to be diminished or impaired.

Provision is made for increasing the protection for the metal sheet, and to this end the external surfaces and edges of the saturated fibrous layer is provided with a facing or surface coating *e* of a material which is substantially non-adhesive at ordinary temperatures but is rendered adhesive by heat and which may be asphalt of a relatively high melting point, and which coating forms a continuous layer of substantial thickness or body in which the protected metal sheet is incased and sealed. The sealing layer *e* may and preferably will have admixed with it a sufficient quantity of inert material, such as pigments, to withstand reasonable wear and tear and which sets into a dense layer, which resists abrasion.

The surface coating serves to seal the volatile constituents of the saturating material and thereby retains this material in effective condition for protecting the underlying or primary coating, and further being of substantial thickness affords protection for the fibrous layers against mechanical abrasion, consequently insuring long life to the protected metal sheet.

The sealing coating *e* being a body or layer of substantial thickness and of a plastic nature also serves as a bonding coating for uniting overlapping sheets and for sealing the joint between the overlapping ends of the sheets, as represented in Fig. 4, by pressure applied to the external sheet. This feature is especially useful when the external surfaces of the overlapping sheets form the external surface of a building.

A suitable facing coating may be formed by incorporating gilsonite or other asphalt of relatively high melting point with cotton seed pitch. This surface coating *e* may be applied in any suitable manner, as, for instance, by passing the metal sheet with the fibrous layers adhering thereto through a bath of the surface coating material, or by rolls or other mechanical means, or it may be by hand.

In practice, the protected metal sheet above described, may be produced in the following manner.

The metal sheet is cleaned in any suitable manner, such as now commonly practised, and is preferably heated and passed through a hot bath of the primary coating material. The metal sheet covered with the primary coating is then passed between opposing layers of asbestos paper or felt or the like, which have been previously saturated with the secondary protective coating, which latter is united with the primary coating by the heat in the latter. The protected metal sheet thus formed may be cooled and cut up into individual sheets, and the latter have applied to them the third protective or sealing coating.

The sealing and binding coating or envelop being of a material or composition which is rendered fluid and therefore adhesive by heat, is capable of being set or hardened substantially in an instant by lowering the temperature of the coating or envelop, which may be accomplished by applying cold or cool water to the coated metal article, and furthermore the latter is capable of being corrugated, bent or otherwise manipulated immediately after the coating has been set, without danger of breaking or destroying the seal for the metal article.

It will thus be seen that a superior product is obtained in that the metal article is protected from corrosion and other deleterious influences by the underlying or primary protective coating, and the latter is maintained in its desired or effective condition by the asbestos layers which are saturated with the secondary protective material, and the latter is maintained in its effective condition by the sealing or third protective coating, in which latter the asbestos protected metal sheet is incased or hermetically sealed.

It may be preferred to use the materials herein specified as the protective coatings, but it is not desired to limit the invention in this respect. In some instances, it may be desirable to apply the surface coating to the saturated fibrous layers before the latter are united with the coated metal sheet, and therefore it is not desired to limit the invention to the specific method of preparing the sheet recited herein.

It will also be observed, that a multiple sealing of the surfaces and the edges of the metal sheet is obtained by the primary protective coating, the saturating material, and by the incasing surface coating, with the result that a more durable and superior product is obtained.

In Figs 1 and 2, I have represented one construction of protected metal sheet in which the fibrous layers *c* meet at the edges of the metal sheet and are cemented together by the asphalt between them, whereas in Figs. 3 and 4, the fibrous layers *c* overlap each other on the upper and lower surfaces of the metal sheet and are cemented together by the asphalt with which they are saturated, and while it may be preferred

to use either construction, it is not desired to limit the invention in this respect.

Claims.

1. An improved article of manufacture, comprising a metal article provided with a primary coating of fluid or plastic adhesive protective material, layers of fibrous material saturated with fluid or plastic protective material and united with the primary coating on opposite surfaces of said metal article, and a surface coating of hydrocarbonaceous material of substantial thickness or body enveloping the external surfaces and edges of the saturated fibrous material to form a weather-resisting sealing and binding envelop in which the said metal article and fibrous layers are incased and of such composition as to be substantially non-adhesive at ordinary temperatures but which is rendered adhesive by heat to enable it to bond with the saturant of the fibrous layers and to be set or hardened substantially in an instant by lowering the temperature of said coating.

2. An improved article of manufacture, comprising a metal article provided with a primary coating of asphalt having a relatively high melting point, layers of asbestos fabric saturated with asphalt of a relatively low melting point and united with the said primary coating, and a surface coating of asphalt of relatively high melting point on the external surfaces of said saturated asbestos layers and united therewith.

3. An improved article of manufacture, comprising a metal article provided with a primary coating of fluid or plastic adhesive material, non-metallic material affixed to the surfaces of said metal article by said protective coating, and a hydrocarbonaceous weather-resisting flexible sealing envelop of substantial thickness or body in which the protected metal article is incased and of such composition as to be substantially non-adhesive at ordinary temperatures but which is rendered adhesive by heat and of being set or hardened substantially in an instant by lowering the temperature of the composition after it has been applied to the metal article.

4. An improved article of manufacture comprising a metal article provided with a primary coating of fluid or plastic adhesive protective material, layers of fibrous material affixed to the surfaces of the said metal article by said protective coating, and a surface coating of bituminous material of relatively high melting point fluxed with a suitable pitch applied to said fibrous layers.

In testimony whereof I have signed my name to this specification.

HAROLD H. ROBERTSON.