Feb. 3, 1931. S. U. McGARY ET AL 1,790,643

METALLIC PROTECTIVE COATING

Filed Oct. 11, 1929

Fig. 1.

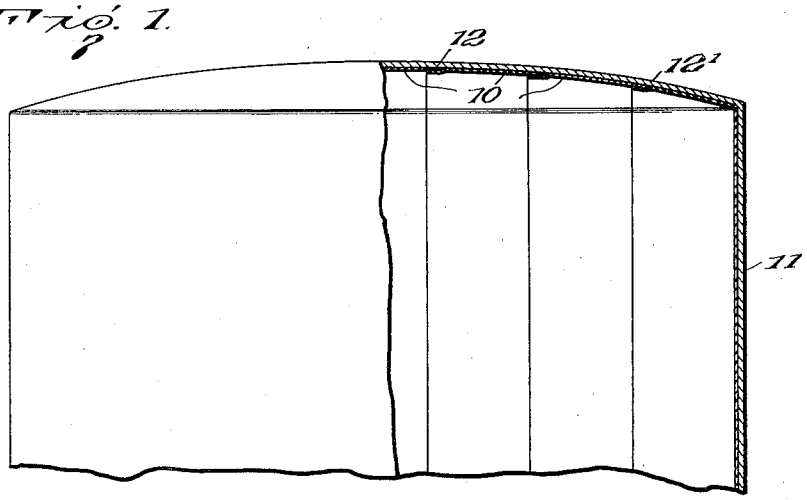


Fig. 2.

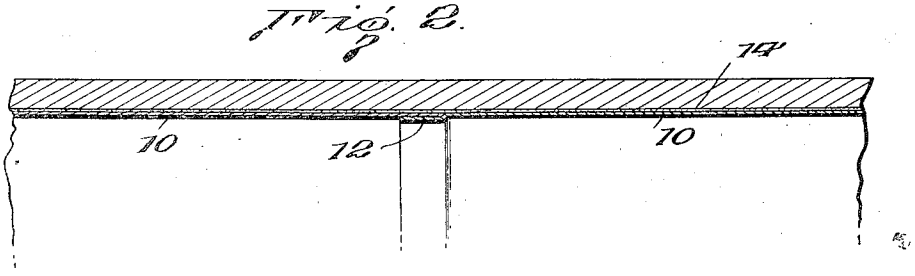
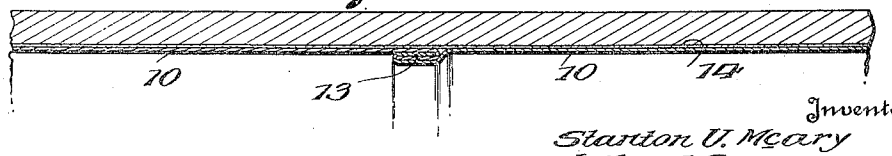


Fig. 3.



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Patented Feb. 3, 1931

1,790,643

UNITED STATES PATENT OFFICE

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METALLIC PROTECTIVE COATING

Application filed October 11, 1929. Serial No. 399,080.

This invention relates to metallic protective coverings or coatings and particularly to the use of metallic protective coverings consisting of thin sheets of resistant metal cemented to the surface to be protected by means of a flexible adhesive compound or binder.

Very thin metal leaf, particularly gold, silver and aluminum has been used for many years in a manner somewhat similar to that proposed by the present invention, but such applications have been designed primarily for purposes of ornamentation and it has always been necessary to afford such applications further protection by the use of a coating of a suitable varnish or lacquer. The object of the present invention is the provision of a protective metal sheet of a gauge sufficiently heavier than common metal leaf so that said metal sheet will, itself, be the protective covering or coating of the surface to which it is applied. In accordance with the present invention the metallic sheet constituting the covering must not be too thin so as to be too fragile, and it must not be so thick as to not possess appreciable flexibility so that by the use of a flexible, or plastic adhesive cement it is possible to apply the protective metal in a large sheet, the cement, by reason of its flexible and plastic character, following and remaining attached to both the surface of the object protected and the protective covering, despite relative movement therebetween due to differences in thermal expansion between the protective coating.

The invention is adapted to various uses but for the purpose of the present application the invention is illustrated as embodied in an oil tank for corrosive oil or oil well brine. In the drawings

Figure 1 is a plan view of a portion of a tank constructed in accordance with my invention, part of said tank being shown in section;

Fig. 2 is a detail view of the lining construction employed in the tank shown in Fig. 1, in which the lap-seam construction is clearly illustrated; and

Fig. 3 is a detail view similar to that of Fig. 2, showing an interlocked seam by which the continuity of the lining is assured.

In the drawings, the same reference numerals refer to similar parts throughout the several views.

The thickness of metal coatings made and applied in accordance with the present invention arrange from 0.0005″ to 0.010″, these limits being found most desirable or advantageous in that materials of a thickness less than 0.0005″ are too fragile for the purposes contemplated by the present invention, while materials possessing a thickness in excess of 0.010″ lack the flexibility which is necessary for successful application. The method of application of the present coating or covering consists in cementing the protective sheet to the base material or surface to be protected with an adhesive of suitable characteristics or, in other words, an adhesive material of such a nature as to bind firmly with both the protective material sheet and the base material. In addition, the adhesive used must also possess a considerable degree of flexibility and plasticity so that it may follow and remain adherent to both the object being protected and the protective sheet, despite relative movements therebetween due to differential thermal expansion. Adhesives found suitable under varying conditions are bituminous combinations of proper physical characteristics, glues or gelatins, and various casein combinations as well as synthetic resins. By using metal sheets of a thickness within the limits specified, joints between juxtaposed sheets can be made absolutely tight, either by the use of adhesive between the overlapping sheets as indicated, at 12, in the drawings or by crimping the edges of the adjacent sheets together as shown, at 13.

Protective coverings prepared in accordance with the specifications hereinabove set forth have been successfully applied by applicants under a number of conditions, and experiments indicate that for many purposes such coverings will afford protection far superior to that obtainable by the use of any other type of protective coating available. One such successful application has been on the interior of tanks which are used for the

handling and storage of corrosive oil or oil well brines. In this instance, an aluminum sheet 0.002" in thickness was employed, as illustrated in the accompanying drawings, wherein the sheeting 10 is shown applied to the interior of the top 12', and the side wall 11 of the tank by adhesive material 14. A similar coating also afforded satisfactory protection to the underside of the deck of a storage tank containing an oil rich in hydrogen sulfide.

As has been said, the limits as to thickness herein specified insure the sheeting having a desired flexibility while, at the same time, it is not too fragile. In addition, sheeting of a thickness within the limit of that specified is capable of being drawn and pressed into perfect contact with the base material or surface to be coated. A protective sheeting of thicknesses mentioned are also found to have much wider range of usage or adaptability. For instance, the present sheeting can be used as a means for the protection of oil well equipment against corrosion. Another important application of the present material is for the protection of structural timber against destruction by insects, rodents, dry rot and other agencies. The use of aluminum sheeting on the exterior of oil storage tanks has been found to give very highly satisfactory results, not only as to the durability of the coating as a corrosion preventive, but due to the very high reflectivity of the aluminum there is a marked reduction in evaporation losses. Aluminum sheeting of approximately 0.001" thickness has also been applied to wooden foundations for the purpose of excluding termites. It is also proposed to coat the inner walls of houses beneath the wall paper with this metal sheeting as it will afford great protection against intrusion of moisture, thereby excluding dampness from the wall paper and other fittings. This is exceedingly advantageous in humid climates.

What we claim is:

1. A protective covering for an object designed to prevent injury of said object by corrosion comprising a coating of plastic adhesive material covering the surface of the object and a sheet of resistant metal having a thickness greater than .0005" and less than .010" pressed into intimate contact with said coating and held thereto by the adhesive property thereof, said resistant sheet having such inherent flexibility and said adhesive coating having such inherent plasticity as to be capable of relative movement under differential thermal expansion and contraction without separation from each other or from said protected object.

2. A protective covering for an object designed to prevent injury of said object by corrosion comprising a coating of plastic bituminous cement covering the surface of the object and a sheet of resistant metal having a thickness greater than .0005" and less than .010" pressed into intimate contact with said coating and held thereto by the adhesive property thereof, said resistant sheet having such inherent flexibility and said bituminous coating having such inherent plasticity as to be capable of relative movement under differential thermal expansion and contraction without separation from each other or from said protected object.

3. A corrosion-resistant protective covering for a structural object comprising a flexible sheet of aluminum approximately .002" thick and a coating of plastic adhesive material holding said sheet to the surface of the object to be protected.

4. A corrosion-resistant protective covering for a structural object comprising a flexible sheet of aluminum approximately .002" thick and a coating of gelatinous adhesive material holding said sheet to the surface of the object to be protected.

5. A corrosion-resistant protective covering for a structural object comprising a flexible sheet of aluminum approximately .002" thick and a coating of plastic bituminous cement holding said sheet to the surface of the object to be protected.

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DISCLAIMER

1,790,643.—*Stanton U. McGary, Walter F. Rogers,* and *Stanley Gill,* Houston, Tex. METALLIC PROTECTIVE COATING. Patent dated February 3, 1931. Disclaimer filed January 20, 1934, by the assignee, *Gulf Research & Development Corporation.*

Therefore disclaims claim 1 of said Letters Patent No. 1,790,643, said claim being in the following words:

"1. A protective covering for an object designed to prevent injury of said object by corrosion comprising a coating of plastic adhesive material covering the surface of the object and a sheet of resistant metal having a thickness greater than .0005" and less than .010" pressed into intimate contact with said coating and held thereto by the adhesive property thereof, said resistant sheet having such inherent flexibility and said adhesive coating having such inherent plasticity as to be capable of relative movement under differential thermal expansion and contraction without separation from each other or from said protected object."

[*Official Gazette February 20, 1934.*]