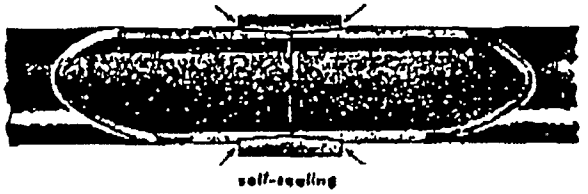
INTKOTE ORANGEBURG® pipe and fittings

root-proof sewer pipe

meets Federal Specification SS-P-356 and U.S. Commercial Standard CS116-54



self-sealing

taperweld® joint

A sewer pipe is only as root-proof as its joints. Orangeburg's engineers were governed by this vital truth when they originated and perfected the Taperweld Joint. Orangeburg's Taperweld Joint is one of the most important improvements in sewer pipe development in the past 100 years. The Taperweld joint requires no cement, no caulking, no compounds nor rubber rings. An accurately machined 2" taper on pipe end fits into a mating taper in the sleeve coupling. A few light blows drive the coupling onto the pipe, producing a self-sealing joint that remains tight against leakage, infiltration and that major cause of sewer line problems, root entry. Both pipe and fittings are joined in this easy, simple manner. When it is necessary to cut the pipe to a shorter than standard length, a factory-quality taper may be made on the pipe right on the job with a light, inexpensive Orangeburg Tapering Tool. Since its introduction *meny* "case histories" have proved the leak-preventing effectiveness of Orangeburg Taperweld Joint's design. Independent investigation of Orangeburg installations from coast to coast in service as long as 50 years, reveals that Orangeburg's Taperweld Joint remains leak-proof and root-prwf.

applicationr

Orangeburg Root-Proof Pipe is recommended for underground non-pressure uses outside the dwelling. Root-proof joints and resistance of coal tar pitch to alkalies and acids normally encountered in domestic sewage and sod, make Orangeburg Pipe particularly adaptable for house-to-sewer and septic tank connections. Orangeburg Root-Proof Pipe is also ideal for underground run-off from downspouts and other similar tight-joint, non-pressure drainage line applications. Among its other uses are its application as a covering for underground metal pipes to protect them from corrosion, and as sleeves and weepholes in retaining walls and other concrete structures.

properties

permanence: Coal tar pitch, the basic material used for impregnating Orangeburg Pipe, has long been recognized as the bitumen that best resists the severe conditions of long underground service. A well-bedded, undisturbed Orangeburg sewer is good for many years of continuous service as evidenced by inspections of Orangeburg installations still in service after 50 years.

hydraulic: Very low friction losses. Under equal conditions Orangeburg Pipe delivers equal or greater flow than other pipes. Williams & Hazen C = 150. Kutter's n = .0084 when S = .01.

chemical: Orangeburg's hard coal tar pitch base resists acids, *alkalies*, salts, oils, greases, and sewer gasses found in sanitary wastes and soils. Chemical cleaners used in accordance with manufacturers' recommendations do not harm Orangeburg Pipe.

temperature: Intermittent temperatures up to 212°F. have no permanent effect upon Orangeburg Pipe. Not recommended for continuous high temperature industrial use. Orangeburg is unaffected by thermal shock (freezing and thawing).

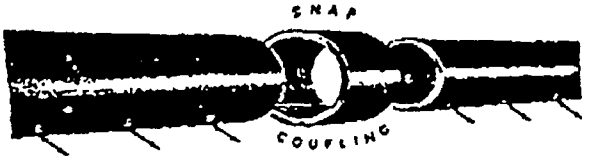
pressure: Orangeburg is a non-pressure pipe and should not be used for continuous pressures in excess of 5 lbs. per square inch.

mechanical; Orangeburg combines flexibility with toughness. It withstands traffic tremors, frost action and normal soil settlements without rupturing or cracking.

PLAINTIFF'S EXHIBIT

FK-291

perforated pipe



Orangeburg Perforated Pipe is composed of the same durable materials as Orangeburg root-proof pipe. The pipe comes in 8' lengths and is constructed with two rows of 5/8" perforations on 3" centers, 100 degrees apart. The perforations are scientifically designed to provide uniform distribution and seepage dong the entire line. The lengths of pipe are joined with a unique snap coupling which requires no special tools. The slot at the bottom of the snap coupling assures complete seepage.

Orangeburg Fittings are used with Orangeburg Perforated Pipe by tapering the pipe ends with an Orangeburg Tapering Tool. The 50-year record of Orangeburg Perforated Pipe in septic tank disposal fields shows that it does not corrode, disintegrate or crack and maintains that all-importad joint alignment.

Orangeburg Perforated Pipe also is made in 6" size lor subsurface drainage such as foundation drains, farm and land drainage and highway subdrainage. The 6" size has Taperweld Joints and 4 longitudinal rows of 3/8" perforations on 3" centers on one semi-circumference. The two bottom rows are 90' apart and the two top rows 160' apart.

advantages

Better Alignment. Both the longer lengths and [illegible] couplings serve to maintain better alignment [illegible] assures better distribution.

Easier to Grade. The longer lengths with fewer joints make it easy to obtain better grade.

Prevents Silting. The evenly spaced perforations, unique snap coupling and high hydraulic [illegible] teristics of Orangeburg Perforated Pipe combine to reduce silting to a minimum in sub-surface drainage application.

Easy to Install. Orangeburg Perforated Pipe's light weight 8 foot lengths mean easier and quicker installation. Can be readily cut with a coarse-tooth saw. The snap coupling eliminates need for any other joint covering.

Durable Construction. Orangeburg Pipe is tough and resilient and withstands rough handling without cracking and breaking.

the unique snap coupling

The snap coupling is designed to serve a dual purpose. (1) To preserve the all important alignment of lengths that is essential to efficient functioning of the disposal field or land drainage installation. (2) To prevent entry of soil, by providing a permanent joint cover, yet allowing seepage at the joint. The snap coupling expands to slip over ends of pipe, holds the pipe permanently in line and prevents silting at the joint.

applications

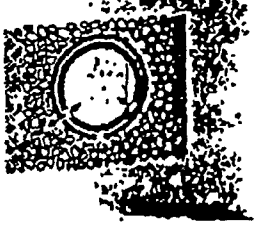
Septic Tank Disposal Fields: Orangeburg Perforated Pipe is ideal for the sub-surface disposal system from a septic tank and is adaptable to all types of installation, The actual layout of the disposal field depends on the number of occupants of the buildings being served, the size, shape and slope of the land, soil porosity, and other variable factors ouch as the location of nearby wells. Local health authorities with a knowledgeof existing conditions should be consulted.

Draining farmland, orchards and muckland: Orangeburg Perforated Pipe will convert a damp, heavy farm soil into a mellow and easily tilled one, increased crop production often pays for the cost of tho drainage in one to three years. Orangeburg Perforated Pipe is equally useful in draining wet spots in lawns, drive-in theaters, athletic fields, golf courses, parking lob, airports, highway and roadbed drainage, etc.

Non Pressure, Sub-Irrigation of Land: Where the soil is suitable. the unusual characteristics of Orangeburg Perforated Pipe open up new fields in sub-irrigation.

Foundation Footing Drains: An effective way of keeping cellars dry is to lay a drain of Orangeburg Perforated Pipe along the outside bottom of the foundation. The water from the downspouts should be carried away from the cellar walls separately using Orangeburg Root Proof Pipe with water tight joints.

Installation: The perforations in the pipe and slot in the snap coupling should be laid downward. In both disposal and drainage work lay the pipe in gravel, crushed alone, cinder or other coarse material up to 3/4" in size.



ORANGEBURG

• Pipe
• Drainage Fittings

pipe

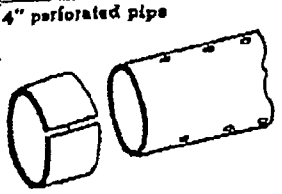
root-proof pipe

one Taperweld coupling included with each length.

size	weight, lbs. per 100 ft.	length, ft.*
2"	125	8
3"	185	8
4"	270	8
5"	475	8
6"	565	8

*up to 15% shorts

4" perforated pipe

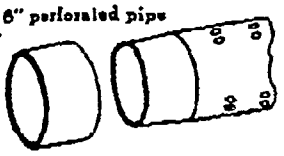


one snap coupling included with each length.

size	weight, lbs. per 100 ft.	length, ft.*
4"	220	0

*up to 15% shorts

6" perforated pipe



one snap coupling included with each length.

size	weight, lbs. per 100 ft.	length, ft.*
6"	565	8

*up to 15% shorts

couplings

extra Taperweld couplings

size	weight, each	packaged quantity
2"	.4	—
3"	.8	80
4"	1.4	48
5"	2.0	36
6"	2.8	24

extra snap coupling

size	weight, each	packaged quantity
4"	8	60

long sweeps

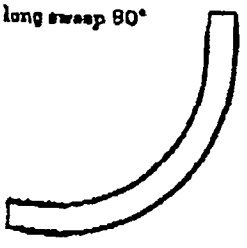
long sweep 45°

cat. no. 806-45

one Taperweld coupling included with each sweep.

size	weight, each	radius	pkg quantity
2"	8.1	9.5"	—
3"	9.0	13"	4
4"	14.0	16"	3
5"	22.5	24"	3
6"	29.0	36"	2

long sweep 90°



cat. no. 806-90

one Taperweld coupling included with each sweep.

size	weight, each	radius	pkg quantity
2"	6.1	9.5"	—
3"	9.0	13"	4
4"	14.0	16"	3
	22.5	24"	3
6"	29.0	36"	2

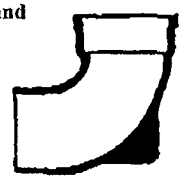
fittings

1/8 bend

cat. no. 816

size	weight, each	packaged quantity
3"	1.1	36
4"	2.1	24

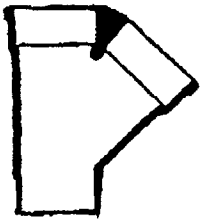
1/4 bend



cat. no. 617

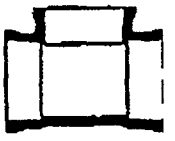
size	weight, each	packaged quantity
3"	1.8	20
4"	3.4	16

wye



cat. no.	size	weight, each	packaged quantity
516	3"x3"x3"	2.6	16
518	4"x4"x4"	5.1	12
526	4"x4"x3"	5.5	12
527	4"x4"x2"	5.5	12
528	3"x3"x2"	3.0	16

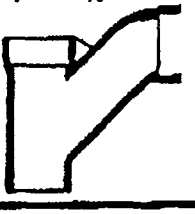
tee



cat. no. 521

size	weight, each	packaged quantity
3"	1.9	20
4"	3.6	12

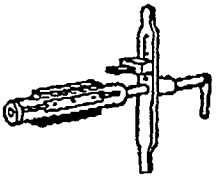
comb. wye and 1/8 bend



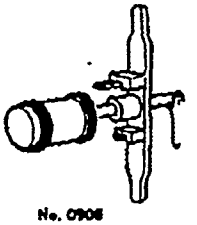
cat. no. 828

size	weight, each	packaged quantity
3"	3.5	6
4"	7.0	6

tapering tools



No. 0903



No. 0906

for field tooling of taper joints on Orangeburg Pipe and Orangeburg Perforated Pipe.

no. 0907 for 2" pipe
no. 0913 for 3" pipe
no. 0906 for 4" pipe
no. 0934 for 3" and 4" pipe
no. 0903 for 3", 4", 5" and 6" pipe

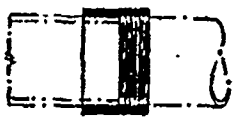
All tapering tools are furnished with necessary cutter blades.
Extra cutter blades may be ordered separately.

extra cutter blades

no. 2820-6 for 2" pipe
no. 2820-3 for 3" pipe
no. 2820-4 for 4", 5" and 6' pipe

adapters

adapter

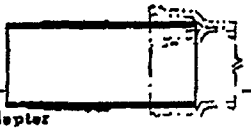


cat. no. 808

Orangeburg pipe to same size threaded iron pipe.

size	weight, each
2"	.5
3"	1.0
4"	1.6
5"	2.2
6"	2.6

adapter



cat. no. 810

Orangeburg pipe to soil pipe hub.

size	weight, each	packaged quantity
2"	.6	—
3"	1.4	30
4"	2.4	20
5"	3.0	12
6"	3.6	12

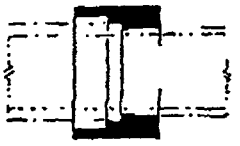
adapter

cat. no. 811

Orangeburg pip. to soil pip. spigot. Tooled Orangeburg pipe to untooled Orangeburg pipe.

size	weight, each	packaged quantity
2"	.6	—
3"	1.6	36
4"	2.9	24
5"	3.0	12
6"	3.6	15

adapter

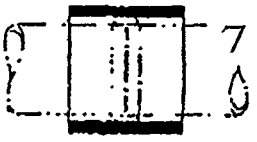


cat. no. 814

Orangeburg pip. to clay pipe spigot.

size	weight, each	packaged quantity
3"	2.0	24
4"	3.5	18
5"	3.7	10
6"	5.2	10

joining sleeve



cat. no. 818

Untooled Orangeburg pipe to untooled Orangeburg pipr. Untooled Orangeburg pipe, to roil pipe spigot.

size	weight, rrob	packaged quantity
2"	1.2	—
3"	2.0	76
4"	3.5	24
5"	3.1	16
6"	5.2	12

cross fitting

cat. no. 448

For perforated pipe.

size	weight, each	packaged quantity
4"	6.0	12

reducer

Larger diameter end determines pricing size. Specify sizes of both Orangeburg pipes.

cat. no. 802

Orangeburg pipe to smaller size Orangeburg pipe.

size	weight, each
3"	1.6
4"	2.9
5"	3.0
6"	3.6

reducing adapter

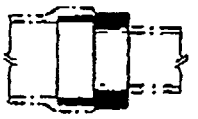
Larger dia. end determines pricing size. Specify size of Orangeburg pipe and size of iron pipe.

cat. no. 803

Orangeburg pipe to smaller size threaded iron pipe.

size	weight, each
2"	.6
3"	1.6
4"	2.9
5"	3.0
6"	3.6

reducing adapter



cat. no. 819

Orangeburg fitting to Orangeburg pipe.

size	weight, each
4" to 3"	1.8
4" to 2"	1.8

reducing adapter

cat. no. 820

Orangeburg fitting to soil pipe spigot.

size	weight, each
4" to 3"	1.9
4" to 2"	1.9

enlarging adapter

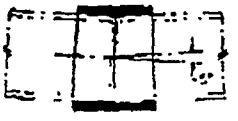
Larger diameter end determines pricing size. Specify sizes of both Orangeburg and soil pipes.

cat. no. 824

Orangeburg pipe to smaller size soil pipe spigot.

size	weight, each
3"	2.0
4"	3.5
5"	3.7
6"	5.2

8 angle coupling



cat. no. 804

Where deflection of pipe is necessary to pass obstruction.

size	weight, each	packaged quantity
2"	.5	60
3"	1.0	36
4"	1.6	27
5"	2.2	18
6"	2.6	18

plugs

cat. no. 0406

size	weight, each	packaged quantity
3"	.5	50
4"	.6	50

ORANGEBURG Manufacturing Co. Division of The Flintkote Company

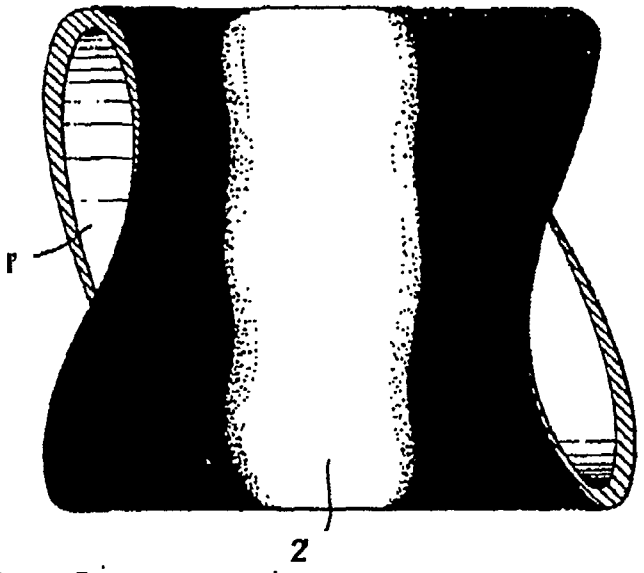
ESTABLISHED 1893

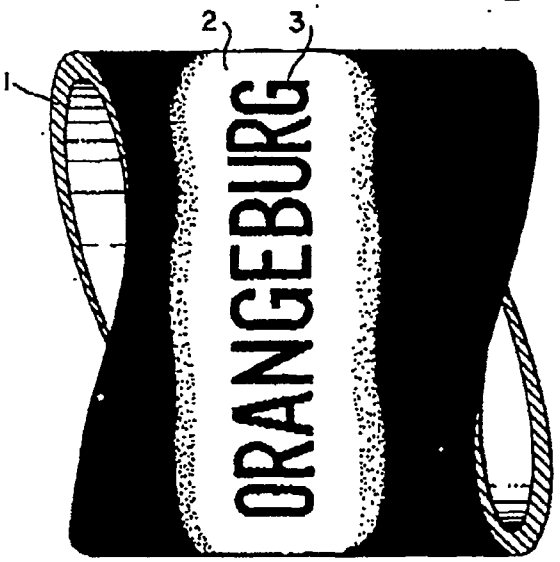
June 17, 1958 D. W. BIKLEN 2,839,088

BITUMINIZED FIBER PIPE

Filed June 1, 1955

FIG. I





FIG, 2

INVENTOR
Donald W. Biklen
BY
ATTORNEYS

United States Patent Office

2,839,088

Patented June 17, 1958

2,839,088

BITUMINIZED FIBER PIPE

Donald W. Bilton, Park Ridge, N. J., assignor to Orangeburg Manufacturing Co., Inc., Orangeburg, N. Y., a corporation of New York

Application June 1, 1955, Serial No. 512,515

2 Claims. (Cl. 138—47)

This invention relates to the marking of bituminized fiber pipe or conduit for subsequent identification. More particularly, the invention is concerned with the application of a permanent marking or markings to such a pipe or conduit for substantially permanent identification thereof without the heretofore necessary preconditioning of the surface of the pipe to be marked.

Bituminized fiber pipe or conduits are a well known product employed primarily for conducting liquids and drainage and for carrying electrical cables and the like where resistance to corrosion, erosion and disintegration is required. The pipe is broadly composed of a bituminous compound reinforced with an interwoven fibrous structure. Its nature and characteristics are fully disclosed in the pamphlet entitled "Commercial Standard CS116-54" issued by the United States Department of Commerce and having an effective date of September 10, 1954.

It has heretofore been difficult permanently to mark bituminized fiber pipe or conduit with conventional marking materials such as ink, paint, lacquer, etc. for subsequent identification without first expensively preconditioning the surface of the pipe to free it from moisture, dirt, dust, etc., which would interfere with the application of the marking material and result in a poor bonding thereof to the pipe surface. In addition, the pitch in the pipe chemically attacks and bleeds into the marking material either immediately after its application to the pipe surface or upon aging. Hence the marking, at least in time, became unidentifiable.

Attempts have been made to overcome the above-set-forth difficulties in marking with conventional marking material by attempting to hot brand the pipe surface with some identifying marking. For this purpose, however, the pipe surface again has to be clean in order to avoid gumming up of the marking mechanism. Furthermore, the pitch in the pipe also tends to gum up the marking mechanism such as a hot brand. Also, of course, the brand itself or the pipe must be heated and must be uniformly so heated. Hence if the pipe were cold from outside storage, for example, branding temperatures that might normally be satisfactory for branding freshly made pipe would have to be modified to accommodate this difference in temperature condition of the surface to be marked.

Other methods of marking have been attempted which require the application of substantial pressure to the pipe. In order to avoid crushing or fracturing, the pipe wall to be subjected to such pressure need necessarily have been backed up, which required of course a substantial uniformity in wall thickness. Hence, crushing and fracturing occurred where wall thickness varied within otherwise satisfactory limits or the surface was not effectively marked.

It is the principal object of my invention to provide a system for readily and permanently marking bituminized fiber pipe which does not depend in any way upon

the general surface condition of the pipe insofar as general cleanliness and temperature condition thereof is concerned, nor further does not depend upon exact wall thickness tolerances.

Broadly my invention involves the application to a portion of the surface of a bituminized fiber pipe of a metal coating that will tightly adhere thereto despite the general condition of the surface when the coating is applied and despite the thickness of the wall beneath such coated portion of the pipe surface. While this metal coating may in and of itself comprise the identifying marking of the pipe, I contemplate that it may be advantageous to add a further marking of a conventional marking material to such coating. Such subsequent marking with a conventional marking material is not subject to the deteriorating factors mentioned above, namely, insecure bonding by reason of dirt, dust or the like or chemical attack from the material of the pipe itself. While such additional marking of the conventional marking material is subject to attack in the same manner from conditions exteriorly surrounding the pipe when in use that it was previously, because of its better condition it tends to be considerably more permanent in this respect than it was when applied directly to the surface of a pipe. In this connection, however, it will be noted that the metal coating by reason of its metallic nature will be better able to withstand any attack by reason of the surrounding conditions than markings of prior conventional marking materials.

More specifically, my invention involves my discovery that the surface of a bituminized fiber pipe or conduit may be effectively marked by spraying thereon in molten condition a metal powder without any preconditioning whatever of the surface of the pipe following manufacture thereof. Hence I have found that regardless of whether the pipe is cold, dusty, wet, has a rough surface or a varying wall thickness, molten metal powder in spray form will adhere thereto. The metal will remain adhered to the surface, not suffering from chemical attack by any of the components of the pipe itself and suffering to a minimum as a result of exterior environment. Furthermore, when cooled, which takes no substantial length of time whatever, a metal coating provides a clean, dry surface which lends itself to a further marking with a conventional marking material such as ink, paint, lacquer or the like.

In the accompanying drawings I have illustrated in Fig. 1 a length of bituminous fiber pipe to which has been applied a metal coating in the form of a band.

In Fig. 2 there is illustrated the same length of pipe with the same metal coating with the additional feature that a marking comprising a name has been applied thereto with conventional marking material.

Referring to Fig. 1, reference numeral 1 identifies a length of bituminized fiber pipe, black in color. A band of metal 2 about 1 mil thickness and made of zinc is adhered to the surface of the pipe. The zinc has been applied from a conventional spray apparatus or gun which receives the zinc in powdered form, heats it to molten states and ejects it onto the pipe in the form of a molten spray. The temperature to which the zinc powder is heated in the spray gun is about 1400° F.

Such a zinc band, which is light gray in color, may itself form the identifying marking. As such it is securely adhered to the surface of the pipe, is non-attackable by the components of the pipe and does, as well as would any other material with which we are familiar and certainly better than conventional marking materials which have heretofore been employed, withstand the deteriorating effect of any exterior environment in which the pipe is used. If, however, some distinguishing marking is desired that is more distinctive than the plain metal band,

for example, a manufacturer's name, it can now be readily applied without difficulty with conventional marking materials because it may be applied to the clean, dry and relatively smooth surface of the metal band. Hence a marking such as that indicated by the reference numeral 3 in Fig. 2 may be applied to the metal band 2 with a conventional marking material such as paint. In addition to the fact that such a marking 3 of a conventional marking material may be clearly and readily applied by reason of the clean, dry surface of the metal band, such a marking will also be free from attack by the pitch in the pipe because of the fact that it is separated therefrom by the metal band that is not itself subject to such attack and therefore acts as a barrier.

While for the purposes of the above illustration powdered zinc has been the metal specifically mentioned, I contemplate that other metals such as powdered aluminum, steel, copper, brass, solder and bronze which are available and which may be similarly applied, may be employed in carrying out my invention. Furthermore, other conventional marking materials such as ink, lacquer or the like might be employed for the marking 3.

As indicated, any metal spray apparatus or gun may be employed in carrying out my invention. For example, such an apparatus that may be satisfactorily employed is one that has generally been known as a Schoop apparatus. One such apparatus is disclosed in Schoop Patent 1,100,602.

It will be clear that various changes and modifications may be made in the above-described marking without

departing from the scope of my invention which should be limited rather only to the extent set forth in the appended claims. For example, while I have disclosed specifically the application of a metal coating in the form of a band surrounding a portion of a piece of pipe, it will be clear that stripes, spirals, etc. might be formed thereon instead.

I claim:

1. A bituminized fiber pipe having a coating on a portion of the surface thereof of a metal, and a marking of a material selected from the class consisting of inks, paints and lacquers on the metal coating of a color contrasting to the color of the metal, the metal coating forming a barrier between the bituminized fiber pipe and the marking preventing the bitumen of the pipe from chemically attacking the marking, whereby the marking is protected against chemical attack and bleeding into by the bitumen of the pipe.

2. A bituminized fiber pipe as set forth in claim 1 in which the metal of the coating is one selected from the group consisting of zinc, aluminum, steel, bronze, copper, brass and solder.

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