

(No Model.)

J. P. COSTIGAN & T. M. VALLEAU.

AIR SPACE COVERING FOR STEAM PIPES, &c.

No. 447,243.

Patented Feb. 24, 1891.

Fig. 1.

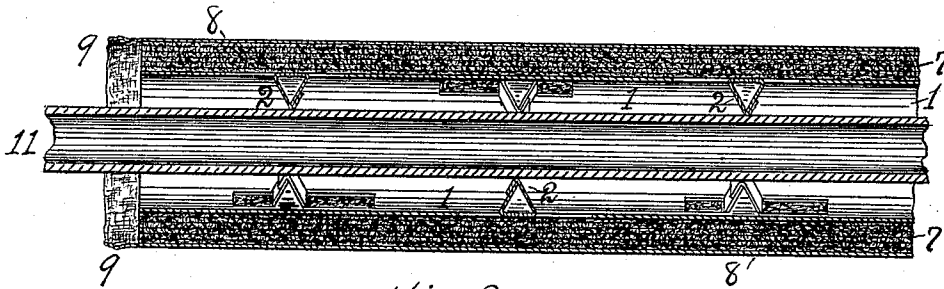


Fig. 2.

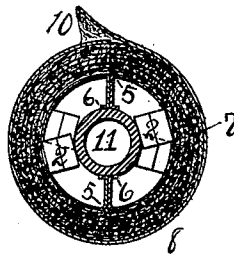
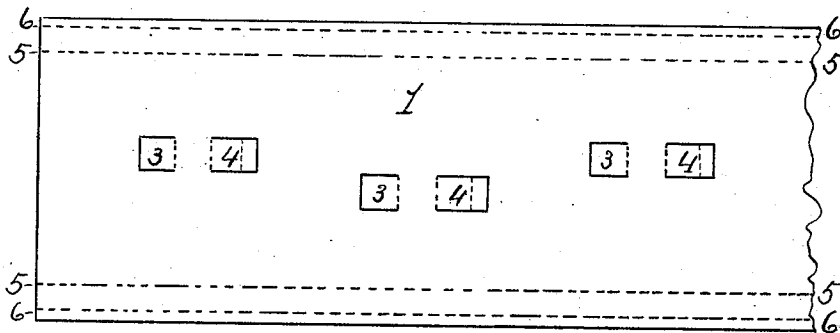


Fig. 3.



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AIR-SPACE COVERING FOR STEAM-PIPES, &c.

SPECIFICATION forming part of Letters Patent No. 447,243, dated February 24, 1891.

Application filed November 6, 1890. Serial No. 370,471. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH P. COSTIGAN, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, and THOMAS M. VALLEAU, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Air-Space Coverings for Steam-Pipes, &c.; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to improvements in coverings for steam-pipes, boilers, and the like, and is of that particular class in which the non-radiating property desired to be effected is secured by the assistance of an air-space included within said covering and immediately surrounding the heated surface.

The object of the invention is to furnish a covering which may be manufactured at a small expense, which may be easily and securely put in place, and which shall possess the requisites of great durability and small conductivity or radiating qualities.

The invention consists in the novel construction of the covering, as set forth by reference to the accompanying drawings, in which—

Figure 1 represents a longitudinal section of our improved air-space covering as applied to a steam-pipe; Fig. 2, a cross-section of the same, and Fig. 3 a plan of the blank from which the inner shell of the covering is formed.

The covering consists of an inner sheet-metal plate or shell 1, having formed therefrom and integral therewith by stamping or otherwise a series of supports or struts 2 2, by means of which the shell is separated from the surface to be covered, leaving an air-space between the two as a non-conducting medium. These supports are of triangular form or V-shaped in cross-section taken in a plane longitudinally of the covering, and are

struck out from the body of the sheet forming the shell in the manner indicated in Fig. 3. At the point where the support is to be located a tongue is formed by cutting the metal through in the form of three sides of a square, as at 3, and at a distance from the termination of the cuts forming the non-adjacent sides equal to the length of said cuts, or of one side of the square thus formed is similarly cut or struck a second tongue 4 by cutting the three sides of a rectangular oblong whose longer sides lie in the same lines with the non-adjacent sides of the square and at a distance therefrom equal to one of the sides of said square. These tongues 3 and 4 are then bent over upon the uncut sides to meet above the same, so as to form an acute angle with the solid part left between them, and the end of the oblong tongue is folded over the edge of the square tongue 3, as shown in Fig. 1. A support or strut is thus formed having the form of an equilateral triangular prism with squares for its sides, whose width is sufficient to afford a considerable degree of strength and whose outer angle, forming the resting-point upon the surface to be covered, is composed of the folded-over portion of the oblong tongue braced by the edge of the other side underneath the fold, and the angle formed by the fold being acute the parts are not liable to slip apart in handling. The height of the triangular support determines the depth of the air-space inclosed by the shell. It is preferable that the several supports should be formed from the blank out of line, as shown in the drawings, to obviate the possible weakening of the shell in case the several cuts were made in the same line lengthwise of the blank. A further support adapted especially for retaining the edges of the separate sections of the inner plate or shell in place at an even distance from the pipe or other surface is shown most clearly in Fig. 2. The edges of the plate 1 are bent inwardly at right angles, as at 5, and again in the same direction, forming the lip 6 at a distance from the body of the plate equal to the desired distance between the plate and the surface to be covered or in connection with the triangular supports shown equal to the altitude of said triangles.

This form is especially valuable in covering cylindrical surfaces, as pipes, since if the immediate edges of the plates are not supported or supported only at the ends of the sections of the covering the shell is liable to collapse at those points upon pressure from the outside, seriously marring the appearance of the work and impairing the value of the covering by defeating to some extent the object sought—that is, securing a uniform depth of air-space at all points between the shell and pipe-surface. By this construction the edges of the sectional parts of the covering are firmly supported throughout their entire length. The bent-up portions of the metal forming the supports will yield or spring sufficiently to allow for the expansion and contraction of the pipe and covering incident to changes of temperature and still retain the covering firmly in place at all times.

The outer covering 7 in which the shell is inclosed may be formed of any suitable non-conducting material and in any desired manner. We prefer, however, a covering consisting of a sufficient number of thicknesses of wool deadening-paper to make the requisite thickness of covering, say one-half inch, cemented together with a preparation of rye-flour and glue in the proportion of one part glue to four parts rye-flour mixed with hot water and afterward subjected to a cooking process with live or dry steam. This preparation is applied to the paper until the whole body is firmly cemented into a concrete mass. The shell 1 is covered with this material to the desired thickness, and an outer covering 8, of canvas or other similar material, is cemented, pasted, or sewed over the whole. For cylindrical surfaces the covering 7 is preferably formed in the first instance as a complete cylinder of the required dimensions over a suitable block or mandrel, allowed to dry in proper form, and is then cut longitudinally its whole length. It may then be spread open to receive the sections of the shell and for placing in position upon the pipe or the like. The edge of the canvas or other outer covering is then brought over and fixed in place by sewing, pasting, or cementing. For such surfaces the shell 1 also should be made in semi-cylindrical sections having each a sufficient number of the V-shaped supports above described, and with both edges of each section folded down and under, as shown at 5 and 6. The canvas forming the outer covering should be of somewhat greater length and width than the length and circumference of the covering in order to leave one end and one edge, as 9 and 10, to overlap the end of the adjacent section and the meeting edges of its own section, respectively, when brought into proper position upon the pipe 11.

It will be noticed that although the covering is prepared for the trade in sections of any desired length, as two or three feet, yet in placing upon the surface to be covered the

continuity of the air-space inclosed thereby is unbroken except slightly by the supports, and by such obstructions as may occur upon the surface itself, as in the case of pipes, by fittings of various kinds, in which case the air-space would be made continuous from one fitting to the next without regard to the length. The result is that by reason of the greater volume of air inclosed a more uniform temperature is preserved, and no one portion of the covering is liable to become heated to a greater degree than another.

The portions of the shell cut or struck out to form the supports may be of any desired size; but the proportions are preferably such as to form a support of about one-half inch in height, thus forming that depth of air-space.

The particular advantage in the use of the cement or paste heretofore described is that it has been found that the effect of heat is to harden the same and to unite the sheets of covering material more firmly into a single compact mass, while the action of heat upon other kinds of cement has a tendency to destroy its adhesive quality, allowing the sheets to peel apart. Various classes of covering material may be used, and the covering as a whole may be used upon any surface where such covering is desirable, as upon steam-chests, boilers, or the like, as well as upon pipes.

We claim as our invention—

1. A covering for steam-pipes, boilers, &c., consisting of an inner plate or shell separated from the surface to be covered by means of V-shaped struts, each formed by cutting or striking out two oppositely-extending tongues from the metal forming the plate, bending the same toward each other, and folding the edge of one tongue over the edge of the other, and a non-conducting covering inclosing said shell and covering and inclosing said air-space, substantially as specified.

2. A covering for steam-pipes, boilers, &c., consisting of an inner plate or shell separated from the surface to be covered by means of V-shaped struts, each formed by cutting or striking out two oppositely-extending tongues of unequal length from the metal forming the plate, bending the same toward each other at equal angles to the body of the plate, and folding the outer extremity of the longer tongue over the outer edge of the shorter tongue, and a non-conducting covering outside of said plate or shell and inclosing the same and the air-space formed between the same and the surface to be covered, substantially as specified.

3. A covering for steam-pipes, boilers, &c., consisting of an inner plate or shell having supports adapted to rest upon the surface to be covered, formed by turning down the side edges thereof and turning under the edge of the turned-down portion substantially at right angles thereto, intermediate supports, each formed by cutting or striking out two

oppositely-extending tongues at a short distance apart from the metal forming the plate or shell, bending the same toward each other, and folding the outer extremity of one tongue over the outer edge of the other, and a non-conducting covering inclosing said shell and air-space formed therein, substantially as specified.

In testimony whereof we affix our signatures in presence of two witnesses.

JOSEPH P. COSTIGAN.
THOMAS M. VALLEAU.

Witnesses:

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C. L. SHELLEY.