METHOD AND APPARATUS FOR SHIPPING PIPE

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This invention relates in general to methods and apparatus for the deformation-proof shipping of lead or other pipe of similarly soft metal.

Hereinafter, the shipping of such pipe has been accomplished by enclosing an individual length thereof in a separate wooden crate. Because of the pliancy of such pipe, it has been necessary to attempt to protect same by such crating from the weight of pipe sections stacked thereabovewith as well as from shock and jarring caused by movement of the transporting vehicle and by careless handling of workmen, to avoid deformation, bending or kinking of the pipe. This expedient has not been satisfactory as pipe distortion occurs despite the crating. In addition to the failure of completely preventing pipe distortion or bending, the use of such crates is expensive since the weight and volume of the same of different size are required to meet the freight charges and after usage are discarded or are returned to the point of origin for further use, entailing substantial freight charges. Time consuming labor is also involved in crating and uncrating operations.

It is an object of the present invention to provide a method for transporting pipe which comprises providing within each pipe a source of pressure exerted against the wall of the pipe to counteract or resist any bending or distorting tendency of the pipe under forces applied during transit or by rough handling.

Another object of this invention is to provide a method for shipping pipe which obviates individual crating and thereby reduce transportation and attendant labor costs.

Another object is to provide for transporting pipe by means easily utilized by unskilled individuals and which does not require the return of bulky objects to the point of origin.

These objects are attained by providing a flexible member for insertion within the bore of the pipe and adapted for inflation by a quantity of fluid for exerting sufficient pressure against the wall of the pipe throughout its extent to resist any bending thereof during shipping. Preferably, the inflatable member incorporates relatively rigid end sections, thus avoiding undue distortion of the ends of the member.

These and other detailed objects are attained by the structure illustrated in the accompanying drawing, in which:

Figure 1 is a side view of an inflatable envelope for use in practicing the present invention.

Figure 2 is a longitudinal section illustrating the inflatable member in operative position within a pipe.

Figure 3 is a longitudinal section illustrating the inflatable member in deflated condition within a pipe.

In the drawing, there is shown an elongated, tubular, inflatable envelope or bladder-like member generally designated 1 which may be utilized to practice the method of the present invention. Envelope 1 comprises a body portion 2 made of flexible material, such as rubber or other plastic material, and preferably the material is elastic. Bonded or otherwise secured to each end of body portion 2 is a cup shaped, rigid member 3, 3'. Fitted in end member 3 and projecting into the interior of envelope 1 is a check valve 4 of the type utilized on pneumatic tubes for tires, through which fluid may be admitted into envelope 1 for inflation thereof or withdrawn therefrom for deflation. Secured to and projecting axially from end member 3 is an eyelet 5 to which a cord 6 may be attached for pulling the envelope into operating position.

A soft metallic pipe, as of lead, cut in appropriate length for shipment is indicated at 7. In deflated rigid, envelope 1 is introduced into pipe 7. Envelope 1 will desirably have a length approximating the particular length of pipe 7, which may be twenty feet, so that when properly located, envelope 1 will extend from end to end of pipe 7. Valve 4 will be connected to a pump or other source of compressed air or gas, and envelope 1 is inflated to a predetermined pressure. The wall of envelope 1 will be forced against the pipe wall and the force developed by the fluid pressure in envelope 1 will be applied equally throughout the length of pipe 7. Consequently, pipe 7 will be internally supported and reinforced, with the pressure exerted by inflated envelope 1 being of sufficient amount to resist counteract such bending forces as may be applied on pipe 7 during shipment.

For illustration, pipe having an O. D. of one inch likely would require pressure in the neighborhood of sixty pounds per square inch. With larger pipe, increased pressure is requisite, as with ten inch pipe a pressure of one hundred and twenty-five pounds per square inch should be adequate.

End members 3, 3' have a maximum diameter slightly less than the inside diameter of pipe 7 in order that they will pass easily through the pipe. The rigid character of end members 3, 3' prevents undue dilation of envelope 1 at its ends so that fluid pressure will not force out the ends of the envelope.

Pipes 7, equipped with envelope 1 in the manner described, may be shipped without any exterior packing, such as the crates heretofore utilized, and may be directly stacked one upon the other. Upon arrival of pipes 7 at destination, envelopes 1 are deflated by opening valves 4 and are easily withdrawn from the pipes and may be returned to the point of origin for further use at a low freight cost since the space required and the weight is small.

It is apparent that the shipping of pipes in the manner above described will reduce the cost of shipping and will effectively prevent the deformation of pipes of soft metals and may be readily accomplished by unskilled workmen.

The details of construction may be varied without departing from the spirit of the invention and the exclusive use of those modifications coming within the scope of the claims is contemplated.

What is claimed is:

1. A method for deformation-proof transportation of soft metallic pipe which comprises inserting an inflatable member in a deflated state within the pipe, inflating said member with gaseous fluid for creating a predetermined pressure against the inner wall of the pipe to counteract distorting forces applied to the exterior of the pipe during shipping, and then transporting said pipe assembled with said inflated member.

2. A shipping unit comprising an elongated pipe of such length and material that it is readily deformable during loading and transportation on railway cars, highway trucks, and the like, and a tube within the pipe and extending substantially from end to end of the pipe and having closed ends of rigid material, one of said ends having a check valve therein for inflating the tube, the diameter of said tube when inflated being substantially equal to the inside diameter of the pipe, and said tube
being airtight and being inflated to exert pressure against substantially the entire interior face of the pipe to resist deformation of the latter.

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