March 24, 1931. E. R. POWELL 1,797,443

MONOLITHIC UNDERGROUND INSULATION

Filed Aug. 24, 1928

FIG. 1

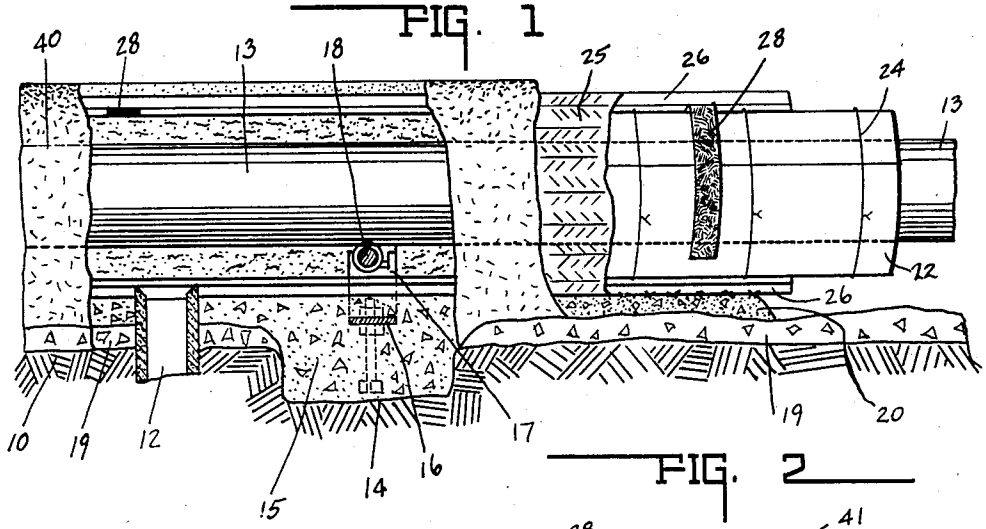


FIG. 2

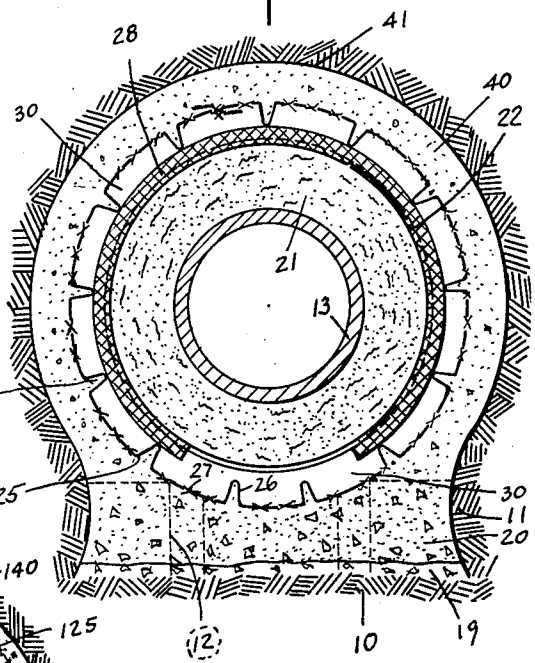
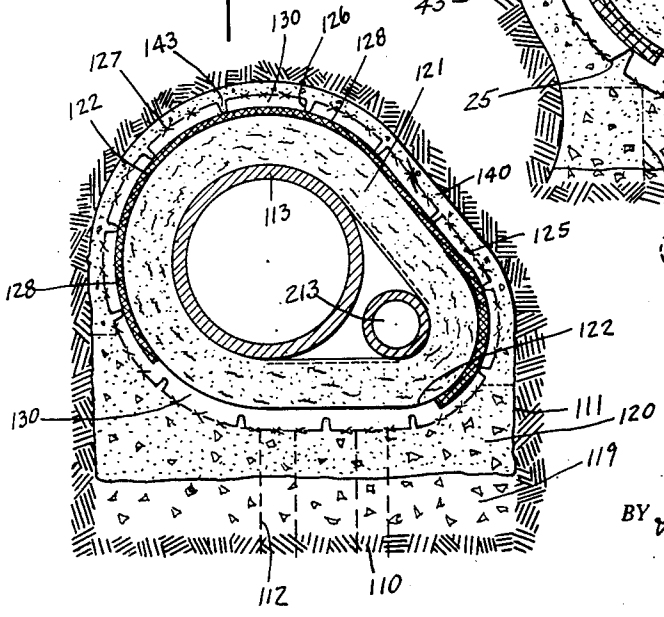


FIG. 3



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UNITED STATES PATENT OFFICE

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MONOLITHIC UNDERGROUND INSULATION

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This invention relates to a monolithic underground insulation and process of forming same.

The chief object of the invention is to provide an underground insulation suitable for one or more pipes and which is self-draining and ventilating permitting ready drainage when flooded and permitting normal condensation drainage.

Another object of the invention is to form the insulation monolithic in character and in situ.

The chief feature of the invention consists in forming a suitable support or base of concrete or the like, enveloping the pipe or pipes to be insulated with a mineral wool jacket or pipe insulation, then embedding in the concrete base a concrete or cement mortar retaining form member and arranging the same in insulation encircling relation and in spaced relation thereto, and then covering the same with cement, or the like, to form a substantially continuous monolithic construction.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims:

In the drawings Fig. 1 is an elevational view with parts progressively broken away to show the invention in detail, certain of the parts being broken away to show other parts of the invention in longitudinal section. Fig. 2 is a transverse sectional view of a single pipe embodiment of the invention. Fig. 3 is a view similar to Fig. 2 but of a construction inclosing a plurality of pipes.

In the drawings 10 indicates the bottom of a trench having the side walls 11, and extending downwardly therefrom is a drain 12. In said trench is positioned a pipe 13 for the transmission of steam, or the like. The foundation is excavated at 14 and concrete 15 embeds a plate or bracket support 16 which supports a plate 17 mounting a roller 18 which supports the pipe and permits the pipe to roll longitudinally thereon when it expands and contracts. The trench is provided with a foundation of broken stone 19 and above the same is positioned a base of concrete 20, and through which the several drains 12 project.

An insulation jacket of mineral wool is mounted upon the pipe 13, said jacket being indicated by the numeral 21, and the same may be of any desired material. Said jacket is inclosed by a covering or wrapping such as asbestos or roofing paper 22 which is suitably overlapped, and said paper may be suitably secured to the mineral wool insulation and preferably by an imperforate anchorage so that the water cannot gain access to the wool, although if the wool is of water proof character the wool itself will resist water penetration. The insulation and wrapping is secured in pipe enveloping relation by rust proof means such as spaced copper wires 24.

Successive lengths of what is commonly known as hy-rib metal lath 25 is then succesively embedded in the concrete base portion 20, with the longitudinal rib portions 26 extending longitudinally of the pipe axis. The rib or metallic form member is apertured as at 27 in any suitable or desired manner, but such apertures or perforations should be small enough so as to retain the concrete or Portland cement mortar, which is positioned without this form member. The ribs 26 as hereinbefore stated extend inwardly toward the pipe and terminate in spaced relation therewith. To maintain the same in spaced relation, a spacing strip of asphaltic material 28 is positioned in partially enveloping relation upon the insulation, see Fig. 1. The successive lengths of metal lath are overlapped, if preferred at one of these strips. A suitable number of intermediate strips 28 may also be employed, the rib on the lath bearing upon or partially embedding itself in the asphaltic spacing strip. This arrangement permits for the compensation or accommodation required by expansion.

The aforesaid construction forms the air upper ventilating and lower draining spaces 30 between adjacent ribs. After the metal lath has been embedded in concrete base 20 to the desired depth and in spaced relation to the insulation forming the lower waterway or drainage channels 30, the same is secured in insulation and pipe enveloping rela-

tion, positioned as aforesaid and preferably with the longitudinal joint formed as a lap joint intermediate the ribbing and at the upper side of the enveloping construction. Portland cement mortar or concrete 40 is then placed around the metal rib lath and the same forms an inner form therefor, and as noted, the concrete is locked by the tongues 43 to the lath. After the cement, mortar or concrete has sufficiently hardened, the back filling 41 may be applied to close the trench.

The resultant construction is not necessarily confined to a single pipe, but a plurality of pipes such as a heating system including a steam supply pipe 113 and a condensate return pipe 213 may be covered by a single construction such as enveloping insulation 121 and the metal lath 125 and concrete or cement 140. The usual air spaces 130 and the water drainage spaces 130 are similarly provided. In Fig. 3 like or similar parts are similarly numbered but are of the one hundred series.

The invention claimed is:

1. The process of forming a monolithic insulation for piping or the like, including the steps of enveloping piping with mineral fiber insulation, enveloping the insulation enveloped piping with a form in spaced relation thereto, and then forming in interlocked relation a monolithic covering in spaced relation to the piping insulation.

2. The process of forming a continuous monolithic insulation for piping or the like including the steps of enveloping piping with mineral fiber insulation, enveloping the insulation enveloped piping with sections of a form, interposing between said insulation and said form sections at the section joints suitable spacing and supporting strips, and forming a monolithic covering in spaced relation to the piping and insulation.

3. In the process of covering underground pipes the steps of forming a moldable base beneath the pipe, embedding a molding form in said base, enveloping the pipe with insulation in spaced relation to the form to form a water channel therebetween, enveloping the insulated pipe with the molding form to form air spaces therebetween and completing the monolithic covering over and about the form.

4. An insulation construction for piping and the like comprising insulation enveloping the pipe and a monolithic coating therefor in spaced relation thereto, and means forming air and water drain passages therebetween.

5. In combination a plurality of parallel pipes, insulation enveloping the same, and a single monolithic coating therefor in spaced relation to the insulation and means associated therewith forming an air and water drain passage therebetween.

6. A continuous insulation coating comprising a piping enveloping insulation tube, an overlapped jointed covering therefor, a plurality of pipe enveloping metal lath sections arranged in substantially continuous relation, a plurality of yielding spacing strips interposed between the lath sections and the insulation for maintaining spaced relation therebetween, and a moldable covering for said lath.

7. A device as defined by claim 6 characterized by the addition of means for securing the covering in enveloping relation, the same being mounted on said covering in spaced relation.

8. A construction as defined by claim 6, characterized by the insulation strips being positionable at the transverse joints of said metal lath sections for supporting opposite adjacent ends thereof.

9. A device as defined by claim 6 characterized by the metal sections being of hy-rib character, with the rib extending inwardly and forming outwardly directed grooves and a plurality of passages between the lath and the insulation, said moldable covering extending into said grooves and being interlocked thereby to the lath.

In witness whereof, I have hereunto affix my signature.

EDWARD R. POWELL.