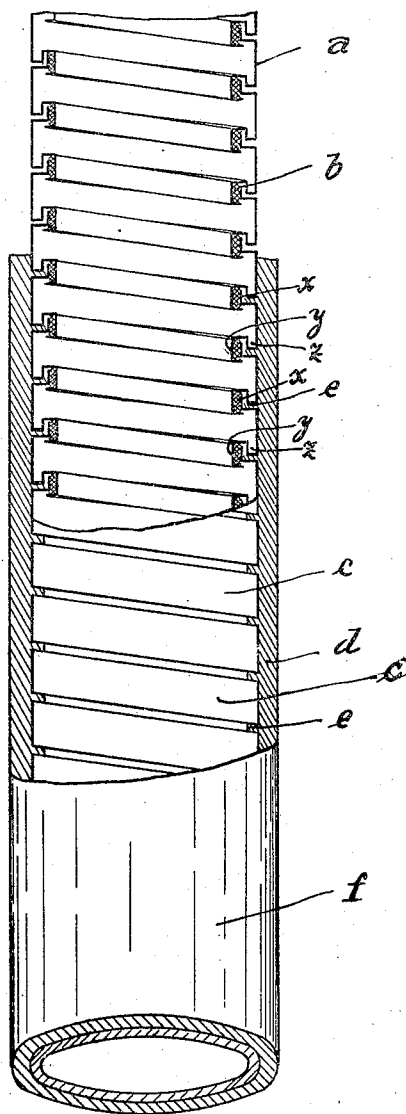


No. 783,361.

PATENTED FEB. 21, 1905.

F. BRIEFS.
LEAD PIPE FOR STEAM OF HIGH PRESSURE.
APPLICATION FILED JUNE 4, 1904.



Witness:
Geo. H. Hume
J. D. Hume

Inventor
Fitz Briefs
by G. H. Hume
Attorney

UNITED STATES PATENT OFFICE.

FRITZ BRIEFS, OF DÜSSELDORF, GERMANY.

LEAD PIPE FOR STEAM OF HIGH PRESSURE.

SPECIFICATION forming part of Letters Patent No. 783,361, dated February 21, 1905.

Application filed June 4, 1904. Serial No. 211,142.

To all whom it may concern:

Be it known that I, FRITZ BRIEFS, a subject of the Emperor of Germany, residing at Düsseldorf, Germany, have invented new and useful Improvements in Lead Pipe for Steam of High Pressure, of which the following is a specification.

Hitherto the heating and evaporation of lixiviums and acid solutions have been accomplished in vessels lined with lead and inclosing a tortuous leaden pipe, which made hot by steam passing through it delivered its heat to the liquids. This process, however, possesses great disadvantages. Had the highly-pressed steam which in practice it is usual to generate been induced the material of the pipe would have had to be so increased in thickness to give it the essential strength that practically no degree of warmth at all would have been thrown off. It was therefore compulsory to keep the pressure of the steam within such a limit that a pipe of thin material might be employed without danger of its cracking, a procedure which on account of the inexpedient reduction of the steam temperature must be considered most uneconomical. Previously the application of superheated steam was not within the bounds of possibility. The present invention is, however, especially fitted for that purpose and entirely removes the drawbacks to which allusion has been made.

The usual pliable twisted pipe *c*, of thin profiled steel or copper ribbon *a* and rendered tight by means of plaited asbestos string *b*, is inclosed and made air-tight with a leaden casing *d* several millimeters thick, thus constituting an internally-equipped flexible lead pipe *f*, which owing to the lead when in a fluid state and being pressed filling out the spiral-shaped exterior grooves *e* of the core-barrel, and thereby forming a spiral rib on the inside of the leaden casing, is so very considerably strengthened that the most exacting requirements are met. When used as heat-pipe in a vessel filled with acid solutions, steam at the highest degree of pressure encountered in

practice, and even superheated steam, may be passed through it. Besides the material of the pipe can be very much thinner than was the case with pipes for steam of low pressure, the result being that the degree of heat conveyed to the exterior of the pipe is greater. Of the further advantages of the internally-equipped lead pipe the following are worthy of note: The pipe can be employed in all cases in which twisted pipes of metal ribbon in profile, and this even lined with lead by the galvanic process, cannot owing to their becoming loose, and consequently leaky by the backward bend of the ribbon. Even when hanging loosely the pipe displays no tendency to vary its form. It is to this new treatment that the pipe owes its reliability and unchangeableness, characteristics to which the twisted metal pipes cannot lay claim. No matter how thick the leaden casing may be the pipe while losing little in flexibility owing to the adaptability and pliability of the lead gains in impermeableness and stability. The possibility of cracking, which in coiling up the lead pipe as well as the pliable-metal pipe is very great, is rendered remote by the present invention, as one pipe supports and secures the other.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. As an article of manufacture a lead pipe having an inner spiral strengthening-rib integral with the main body of the pipe, and having an inner strengthening-lining which consists of a spiral ribbon of pliable metal such as copper, covering the inner surface of the lead pipe between the circonvolutions of the rib, and covering the rib with overlapping edges, said edges being made tight by the interposition of a spiral strip of asbestos.

2. As an article of manufacture a lead pipe having an inner spiral strengthening-rib integral with the main body of the pipe, and having an inner strengthening-lining which consists of a spiral ribbon of pliable metal such as copper and of peculiar trough-shaped cross-section, said trough presenting on one

edge an angular flange x and on the other edge
an inverted trough y , smaller than the main
trough and being attached to the same by a U-
shaped bend z , substantially as shown in the
5 drawing, said spiral ribbon covering the in-
ner surface of the lead pipe between the cir-
convolutions of the rib, and covering the rib
with overlapping edges, said edges being made

tight by the interposition of a spiral strip of
asbestos.

In testimony whereof I affix my signature. 10

FRITZ BRIEFS.

In presence of—

WILLIAM ESSENWEIN,
PETER LIEBER.