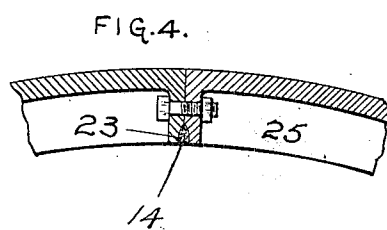
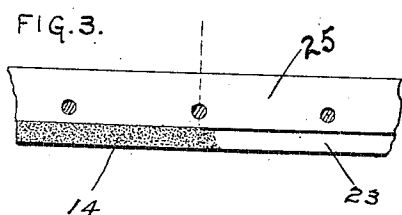
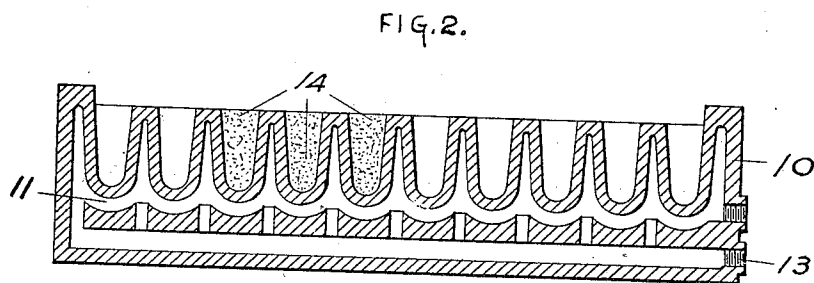
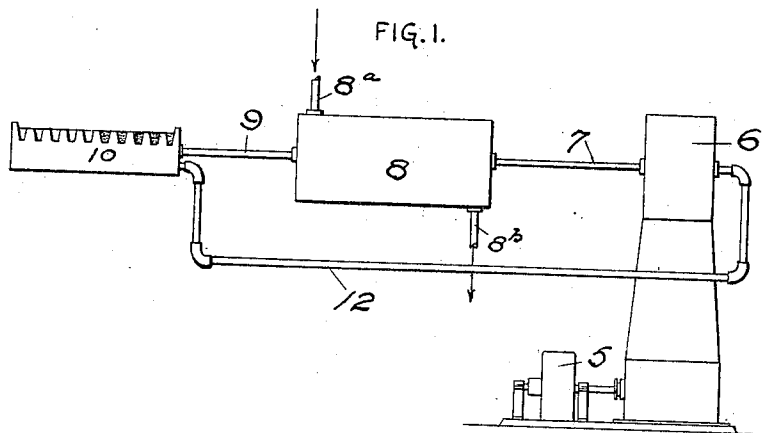


No. 838,341.

PATENTED DEC. 11, 1906.

W. Y. LEWIS.
PROCESS OF CALKING.
APPLICATION FILED SEPT. 22, 1906.



WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM YORATH LEWIS, OF FLUSHING, NEW YORK, ASSIGNOR TO
S. PEARSON AND SON, INC., OF LONG ISLAND CITY, NEW YORK,
A CORPORATION OF NEW YORK.

PROCESS OF CALKING.

No. 838,341.

Specification of Letters Patent.

Patented Dec. 11, 1906.

Application filed September 22, 1906. Serial No. 335,840.

To all whom it may concern:

Be it known that I, WILLIAM YORATH LEWIS, a subject of the King of Great Britain and Ireland, residing in Flushing, in the county of Kings, in the State of New York, have invented certain new and useful Improvements in the Process of Calking, of which the following is a specification.

This invention relates to a process of applying calking material, and particularly calking material used in calking joints between the segments in the metallic linings of subaqueous tunnels and the like.

The object of my invention is to relieve the present process of several of its objectionable features, as well as to improve the quality of the work and to expedite and cheapen the cost and operation of the same.

In the accompanying drawings, Figure 1 is a general view of a portable refrigerating apparatus which may be employed in carrying out my process. Fig. 2 is a cross-section of a freezing-mold. Fig. 3 is a section of a joint between segments of a tunnel-lining, showing my calking apparatus in operation; and Fig. 4 is a cross-section of the same at right angles.

Iron filings or fine borings constitute, when mixed with a proper portion of water or solution of sal-ammoniac, one of the most effective calking materials for joints in subaqueous structures, since the chemical action which takes place in the presence of the moisture, especially when combined with the sal-ammoniac solution, causes the filings to "set" quickly in the opening of the joint, thereby filling and permanently closing the same. The material thus prepared for use has much the same consistency as wet sand, and while it is not difficult to tamp this into the segment-joints in the lower half of a tubular tunnel it is quite difficult to work with any speed on the side and especially on the top, because the filings fall out of the jointing-spaces before they can be tamped in. Not only is the work slow, but there is also much waste. Furthermore, this process is at present carried on by hand, and there is more or less injury caused to the fingers of the workmen by the presence of the sal-ammoniac in the material which is handled. Again, the gases given off during the chemical action of

the iron and sal-ammoniac compound have proven a very unpleasant, if not unhealthful, factor in the work. There is also the objectionable splashing of the moisture when tamping in the moist material, which is a source of annoyance to the operators. Many of the objections noted are also present when other calking materials are used—such as cement, for example.

My invention obviates or lessens the disadvantages mentioned.

It consists in freezing the calking material after it has been prepared for use and then applying it to the joints by any suitable means.

Thus, besides appreciably suppressing the gases which arise during the chemical activity of the compound when iron filings are used, and this is particularly objectionable when work is performed under compressed air, I do away with the injury to the hands of the workers, and my process has the decided advantage of delaying the chemical activity, which is greater during the first hour after the mixture is made, until the material has been applied to the joints to be calked. The firmest possible set of the material in the joints is thus secured; but the greatest advantage of my process is the speed with which it enables the calking to be accomplished and the freedom from the waste during the operation, with consequent economy and better work.

To shape the material suitably for use, I may provide molds lined with any non-oxidizing surface and of any desired size and shape in which the material may be frozen. The manner in which refrigeration is carried on is immaterial to the process. Thus the molds may be immersed in brine at the mouth of the tunnel and the frozen sticks carried to the working-points in a suitably-insulated receptacle, or the brine may be piped to the working-point in the tunnel and the material there frozen; but I prefer a small electrically-operated ammonia refrigerating apparatus, which may be mounted on the staging at the working-point. Such an apparatus is illustrated in Fig. 1. The electric motor 5 operates the compressor 6, whence the ammonia passes through pipe 7 to the cooler 8 and is led thence by pipe 9 to

a refrigerating-mold 10 through the passages 11, in which it expands, freezing the material 14 and being returned to the compressor through the return-pipe 12 from the outlet 13 in the mold. Pipes 8^a and 8^b supply a constant circulation of water to the cooler 8.

After the calking material has been frozen into suitable forms it is removed from the molds and at once applied to the joints in any suitable way—by hand, if desired, or by mechanical apparatus. It is preferably forced into the joint by any usual or suitable calking-tool. In Figs. 3 and 4 metallic segments of a tunnel-lining are indicated at 25, with a joint 23 to receive the frozen body of calking material 14. Where considerable leakage occurs at a joint, it may be advisable to vary the process by freezing a stick of concentrated chemical separately, inserting this into the joint first, and following with the frozen stick of filings or borings, cement, or other material. The leakage that occurs before the material has set will thus combine with the frozen chemical as it melts, permeate the filings, and instead of washing out the chemical already there will afford a new supply, and thus not delay the set.

While my invention is particularly applicable to the calking of subaqueous tunnels, it may be used under any circumstances, and I do not limit it to any particular use, nor do I limit myself to the employment of any particular calking composition.

I claim as my invention—

1. The process of calking, which consists in first freezing the calking material and then

applying the same while frozen to the joint to be calked.

2. The process of calking, which consists in first freezing moistened calking material and then applying same while frozen to the joint to be calked.

3. The process of calking, which consists in freezing a mixture of sal-ammoniac and iron filings and applying said mixture while frozen to the joint to be calked.

4. The process of calking, which consists in first molding and freezing the calking material, and then applying the same while frozen to the joint to be calked.

5. The process of calking, which consists in freezing a mixture of sal-ammoniac and iron filings, and applying the same to the joint to be calked, while in a frozen condition, and then forcing said mixture into the joint.

6. The process of calking, which consists in applying an active agent to a joint to be calked, and afterward applying thereto a body of frozen calking material adapted to be acted on by said agent.

7. The process of calking, which consists in applying a body of frozen sal-ammoniac to an aperture to be calked, and then applying a frozen mixture of sal-ammoniac and iron filings to said partially-calked aperture.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM YORATH LEWIS.

Witnesses:

JOHN L. BRESLOFF,
J. TITUS HANCOCK.