July 9, 1929. S. L. MOORE, JR 1,719,989

METHOD OF AND APPARATUS FOR ASSEMBLING INSULATORS

Filed May 13, 1926 2 Sheets-Sheet 1

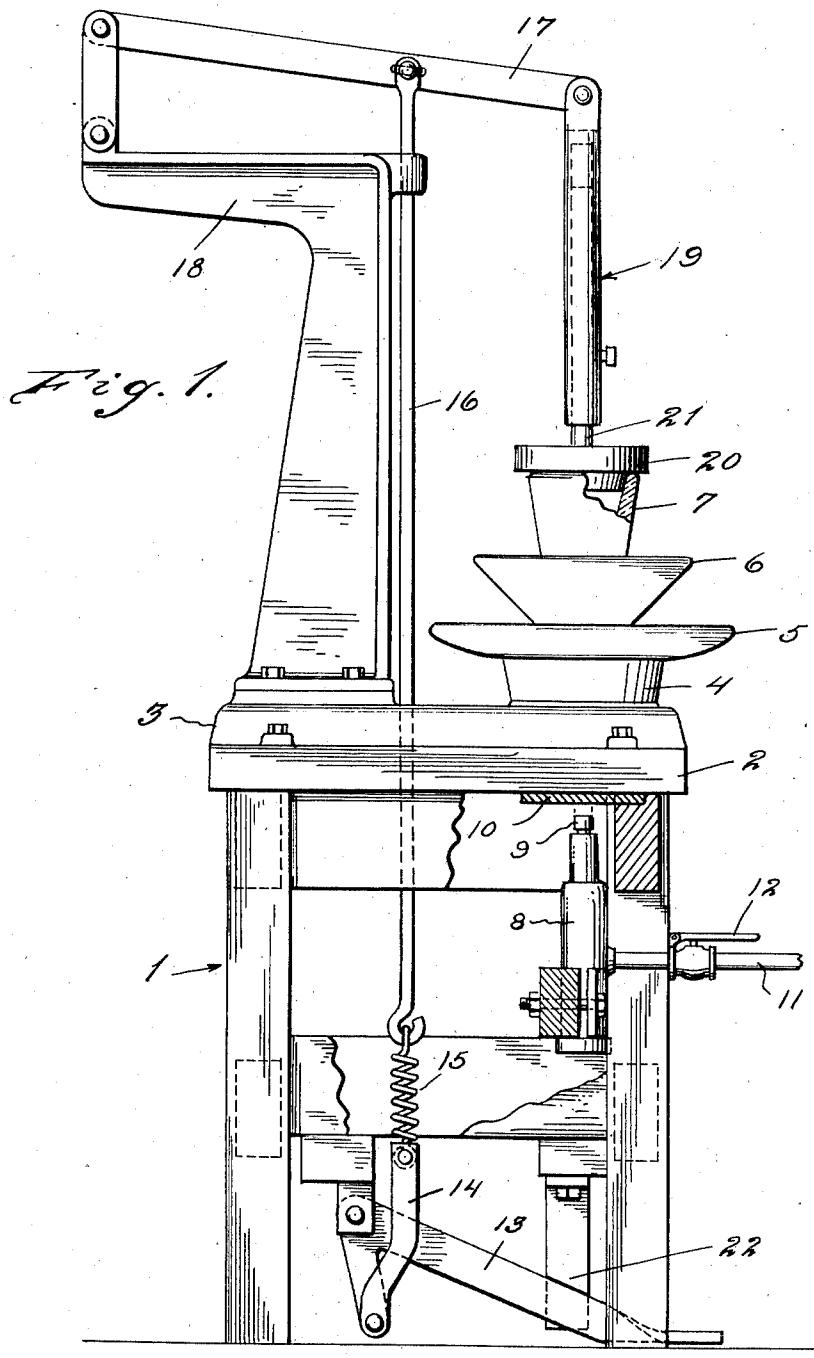

Fig. 1.

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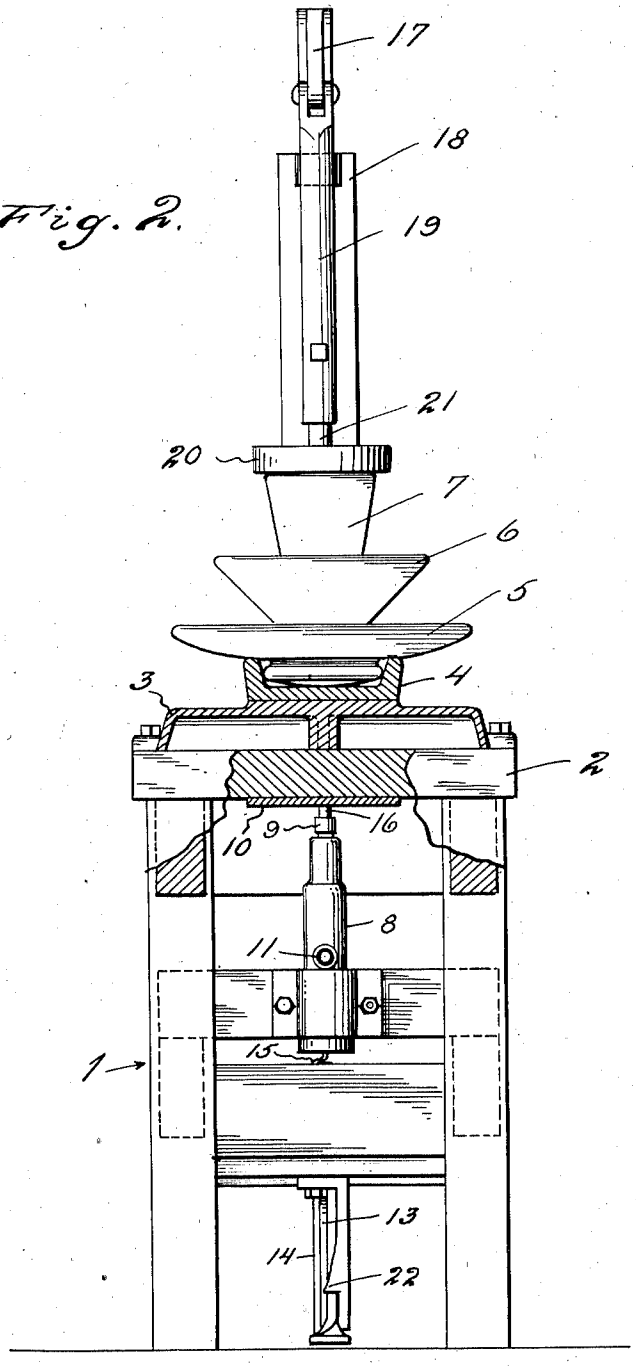
Fig. 2.



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UNITED STATES PATENT OFFICE.

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METHOD OF AND APPARATUS FOR ASSEMBLING INSULATORS.

Application filed May 13, 1926. Serial No. 108,916.

The invention relates to a method of and apparatus for assembling or cementing together the porcelain sections or other parts of an insulator.

The principal object of the invention, generally stated, is to provide an assembling or cementing method and apparatus whereby the parts and the cement will be so treated as to eliminate air pockets and cracks and to cause the cement to enter whatever grooves, recesses, interstices or the like which may be present.

The object of the invention, more specifically stated, is to provide a method of treatment, and apparatus for carrying it out, wherein the porcelain or other parts of an insulator or other device are subjected to rapid vibration after or while the cement is poured in, the vibration acting to eliminate air pockets and cracks and to cause the cement to possess or attain a more homogeneous character throughout the mass thereof, in addition to causing the cement to enter every possible space.

An important object of the invention is to provide a method and means of this character in which pressure may be applied to the parts to be assembled while the parts and the cement for uniting the same are subjected to vibration.

Another object of the invention is to provide means for carrying out the method so constructed and arranged that the parts to be assembled may be held under pressure for any desired length of time not only during vibratory action but also for any desired period thereafter so that any creeping of the parts during setting of the cement will be entirely prevented.

A further object of the invention is to provide an apparatus for carrying out the method in which the pressure applying means may be latched or otherwise held in pressure applying position during vibratory action and subsequent thereto.

To the attainment of the foregoing and other objects and advantages the invention preferably consists in the method steps and the arrangement and combination of parts for carrying out the method, the steps and structural details being hereinafter more fully described and claimed, and illustrated in the accompanying drawings in which:

Figure 1 is a side elevation of the device with parts broken away and in section, the pressure applying means being shown in operative position,

Figure 2 is a front elevation of the device with parts broken away and in section.

Referring more particularly to the drawings I have shown the device as comprising a supporting frame or stand 1 of any ordinary or preferred type having mounted upon the top 2 thereof a table or platform member 3 supporting a form 4 adapted to receive the top portion of an inverted insulator cap or top member 5 and preferably so shaped and of such size as to substantially conformingly receive the same. In the present instance the member 5 is represented as the topmost element of a pin or pedestal type insulator though it should be distinctly understood that there is no special limitation as to the type of insulators or other devices to be assembled by the method and apparatus, the disclosure being simply for illustrative purposes only. An insulator of such a type includes other elements 6 and 7 which it is necessary to cement together.

For imparting vibratory movement to the nested insulator elements, or other members to be assembled, use may be made of any ordinary or preferred type of air hammer, rivet gun or the like, or in fact any equivalent vibration producing apparatus indicated at 8 so positioned and arranged with respect to the assembled insulator or other elements as to vibrate them and the cement which is of course poured into them for effecting securing. As a mere matter of convenience the vibration producing device 8 may be mounted within the support or stand 1 in such position that its head or other vibrating element 9 may engage a wear plate 10 on the top 2 so that when the device 8 is in operation a strong vibration will be imparted to the nested insulator or other elements. Clearly, the device 8 need not be an air hammer as it may just as well be an electrically or electro-magnetically operated mechanism or any other apparatus capable of developing vibrations and transmitting them to the elements to be assembled. In case the device 8 is pneumatically operated, there will be provided a compressed fluid conductor 11 having a suitable control means 12 interposed therein or connected therewith for the purpose of controlling the supply of power to the device 8.

In the carrying out of the method, the cap

or equivalent element 5 is placed in position within the form or holder 4 and the member 6 is nested within the element 5 prior or subsequent to which suitable cement or other binding or sealing material is introduced within the element 5 while or before the vibration producing device 8 is set in operation. Any desired number of insulator or other elements may be nested and have cementitious or other similar material applied thereto and the vibratory action produced for causing the cement or other material to settle and flow into all cracks, grooves, crevices and recesses in the elements to be assembled and, clearly, the vibratory movement may be continued for as long or as short a time as may be found advisable to insure the proper settling of the cement and the driving out of any air bubbles or the like which may be present in the mass.

As an additional feature, I have found it of advantage to apply pressure to the various elements such as those indicated at 5, 6 and 7 while the vibratory movement is produced. A convenient method of carrying out this feature may involve the utilization of the means illustrated which may consist of a treadle 13 suitably pivoted upon the stand 1 and having connected therewith a link 14 connected through a spring 15 with a pull rod 16 in turn pivoted to a lever 17 suitably fulcrumed on a frame member or standard 18 mounted upon and rising from the stand. The lever 17 may be equipped with a plunger 19 carrying a head 20 adapted to be engaged within the uppermost one of the elements to be assembled. As a matter of convenience the member 19 may be tubular and have a stem 21 slidably adjustably mounted therein, the stem 21 carrying the head 20. The slidable adjustability of the stem 21 permits placing or locating the head 20 at a position convenient to engage different successive ones of a plurality of elements to be assembled. Obviously, plunger members of different lengths could be used instead of having this adjustment, if such is found desirable for any reason.

As stated above, all of the elements 5, 6 and 7, or their equivalents, may be initially nested and all cemented together at the same time, if preferred. However, I have found it of advantage, at least under most circumstances, to place the element 6 within the element 5, flow in the cement and then vibrate the elements to effect settling of the cement and to eliminate air pockets therein. If the cement used is of such a nature that it will not set too quickly, the next element 7 may be nested within the element 6 and the operation repeated without in any way interfering with or impairing the efficiency of the holding action of the cement which secures the first and second elements together. Such details in the operation may of course be varied to meet circumstances and whatever conditions may exist and still be well within the scope of the invention. As a mere matter of convenience some means may be provided for maintaining the treadle 13 in its operative or pressure applying position and in the drawing this means is represented as consisting of a shoulder or other latch 22 beneath which the treadle may be engaged so as to relieve the operator of the necessity of holding the treadle down. This detail is a mere matter of design and does not in any way affect the principles involved.

From the foregoing description and a study of the drawings it will be apparent that I have thus provided a very easily carried out method for assembling insulator elements or the like in a very rapid and highly efficient manner. Actual experience has demonstrated that the holding action of the cement applied in accordance with this method is far superior to the results obtained by the employment of other methods inasmuch as no air pockets can exist after the cement and insulator elements have been subjected to the rapid vibration. All the grooves, recesses and other depressions or crevices which should be filled with cement are filled and all possible areas are therefore engaged and the securing action consequently made the maximum.

While I have shown and described the preferred embodiment of the invention and the detailed steps involved in the method, it should be understood that many changes may be made in the details of construction of the apparatus employed in the sequence and duration of the steps in the method provided such variations constitute no departure from the spirit of the invention or the scope of the claims hereunto appended.

Having thus described the invention, I claim:

1. The method of cementing together the parts of an insulator, consisting in subjecting the insulator to rapid vibration and to pressure while the cement is poured therein.

2. The method of cementing together the parts of an insulator, consisting in subjecting the insulator to rapid vibration and pressure during pouring of the cement therein and for a short period of time thereafter.

3. The method of cementing together the parts of an insulator, consisting in positioning the insulator on a rapidly vibrating table and submitting the parts to pressure axially thereof while the cement is poured therein.

4. The method of cementing together the parts of an insulator, consisting in positioning the insulator on a vertically vibrating table, and submitting the parts to yieldable pressure axially thereof during pouring of the cement therein and for a short period of time thereafter.

5. Means for supporting an insulator while cementing it, comprising a table, a carrier or form on the table to support the insulator while the cement is poured therein, means for imparting vibratory movement to the table, and means for applying pressure to the insulator longitudinally thereof.

6. Means for supporting the parts of an insulator while cementing them, comprising a table, a form thereon adapted to support the lowermost one of the parts, means for imparting vibration to the table and the insulator parts carried thereby, and yieldable means for applying pressure to the insulator parts during vibration.

In testimony whereof I affix my signature.

STEWART L. MOORE, JR.