May 26, 1931. S. FLAM 1,806,620

VIBRATOR MECHANISM

Filed June 24, 1926

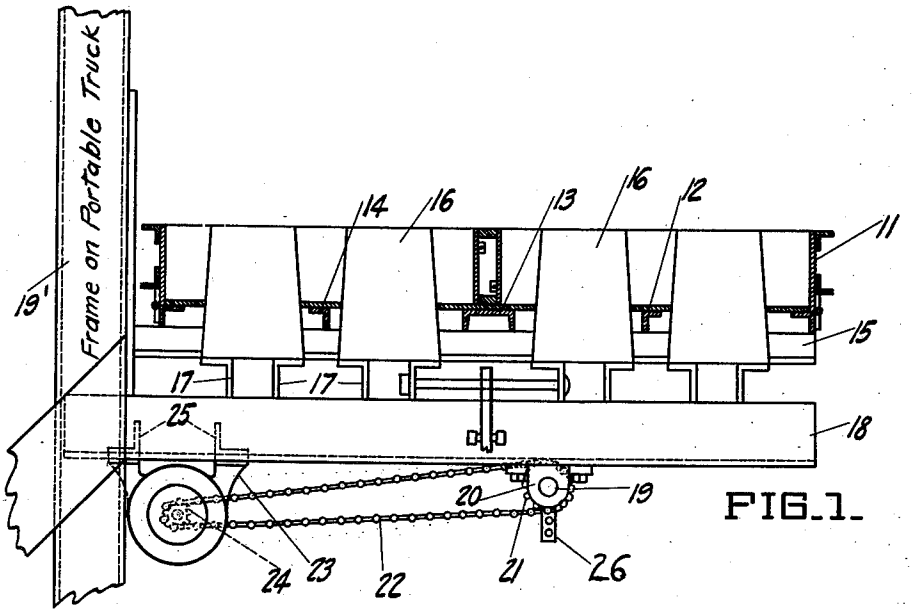


FIG. 1.

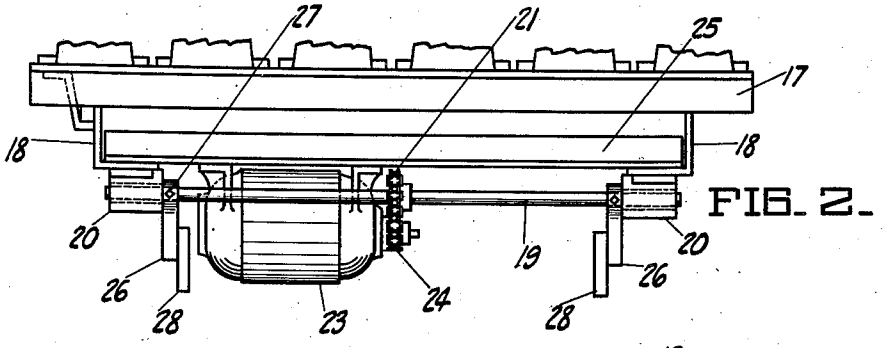


FIG. 2.

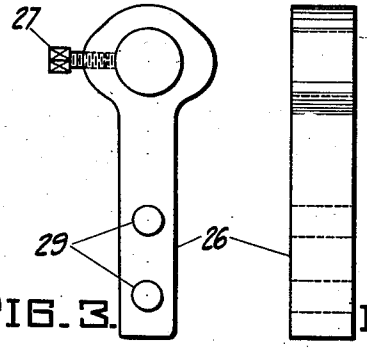


FIG. 3.

FIG. 4.

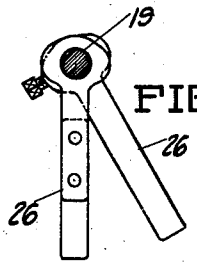


FIG. 5.

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Patented May 26, 1931

1,806,620

UNITED STATES PATENT OFFICE

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VIBRATOR MECHANISM

Application filed June 24, 1926. Serial No. 118,268.

This invention relates to a system for casting or molding, and particularly to a scheme whereby the cast product can be rendered dense and homogeneous by vibration during the process of pouring.

It is well-known, especially in connection with the casting of concrete, cement, or the like, that porosity is apt to occur unless special precautions are taken. For example, continual and thorough tamping by skewer-like rods or bars, thrust into the filled mold spaces, has been used to produce density and homogeneity. In other schemes, the molds were subjected to vibration to cause the material in them to settle. Such prior schemes have been found to have disadvantages; they are either time consuming, or else the apparatus used is unreliable and requires frequent adjustment and repairs.

It is accordingly one of the objects of my invention to produce density and uniformity of structure in cast products in a simpler manner.

It is another object of my invention to provide an improved vibrator mechanism, and especially in connection with molds.

It is still another object of my invention to make it possible to adjust readily the degree of vibration in such mechanisms.

It is still another object of my invention to provide a vibrator mechanism which is portable, and conveniently arranged so that the filled mold can be vibrated thereby without necessitating transporation to a vibrating station.

My invention possesses many other advantages, and has other objects which may be made more easily apparent from a consideration of one embodiment of my invention. For this purpose I have shown a form in the drawings accompanying and forming part of the present specification. I shall now proceed to describe this form in detail, which illustrates the general principles of my invention; but it is to be understood that this detailed description is not to be taken in a limiting sense, since the scope of my invention is best defined by the appended claims.

Referring to the drawings:

Figure 1 is a side view of a vibrator mechanism, incorporating my invention, shown as installed on a multiple block molding apparatus, a part of said apparatus being in section;

Fig. 2 is a front view of the apparatus shown in Fig. 1, parts being omitted;

Figs. 3 and 4 are respectively front and side views of an adjustable weight utilized in my invention; and

Fig. 5 is a detail diagram illustrating one manner in which the degree of vibration can be controlled.

In Figs. 1 and 2, the vibrator is shown as applied to a block molding apparatus that is described and claimed in an application filed February 19, 1925, in my name, having Serial Number 10,265, and entitled: "Process and apparatus for molding". In that system, the mold 11 has a pallet 12, having stiffener bars 13 and 14 fastened to its lower surface, and supported on a series of transverse angle irons 15. A plurality of cores 16 projects through the bottom of the pallet 12, and are fastened to the spaced angles 17, which form a grid held together by the bars 15.

The core structure is removably held on a supporting element, such as a pair of angle irons 18, in turn supported on a frame 19'. Since the details of the cores, the molds and their supports are all carefully explained in my prior application, further description is unnecessary. However, it is to be specifically noted that frame 19' forms a portion of a portable truck, used to carry the molds to a curing space.

I transmit vibrations to the supporting structure, and thereby to the molds 11 and cores 16. For this purpose, I move unbalanced weights rapidly, as by rotation about an axis, the supports for which weights are in mechanical connection with the molds. For example, a rotatable shaft 19 is shown as supported below angles 18, by the aid of bearings 20, bolted on the lower surface of the angles. To this shaft is attached a driving mechanism, such as a sprocket wheel 21, driven by a chain 22. This chain in turn is moved by a small motor 23, by the aid of a sprocket 24 fastened to its shaft. The motor

can conveniently be fastened to the structure by the aid of transverse angles 25, connecting the angles 18.

The unbalancing weights 26 are fastened as by set screws 27 to shaft 19, one at each bearing 20. These weights serve also as collars to prevent relative axial movement between shaft 19 and its supports. It is seen that the axis of rotation is spaced at a distance from the center of gravity of the weight, whereby the unbalancing is effected. The weights are shown in detail in Figs. 3 and 4. To enhance the vibration effect, supplementary weights 28 can be used, attached by the aid of apertures 29 to the main weights.

Rapid vibration, of sufficient intensity for the purpose required, is imparted by the unbalanced weights 26 to the mold structure. This vibration is needed mainly during the process of pouring the plastic material in the molds. I have found that the vibration effect can be controlled by the rate at which shaft 19 is driven; for usual purposes, several hundred to a thousand revolutions per minute can be used; but of course I do not limit myself within these bounds, for a faster or slower rate can also be advantageously used.

One of the important advantages of my invention is the ease with which the degree of vibrations can be controlled. This can be done in several ways; one, by varying the weights themselves by adjustment, as by the aid of the supplementary weights 28; and again, by varying the relative angular positions of the two weights 26. In Fig. 5, the weights are shown as occupying different angular positions with respect to the axis of shaft 19. By alining them, a more intense vibration can obviously be obtained. This adjustment can be accomplished by loosening set screws 27, and tightening them after the proper position of the weights is obtained.

Suitable controls can be provided for the motor 23; and since my invention is not concerned with such controls, it is considered unnecessary to disclose them.

I claim:

1. In a vibrator mechanism for molds, a pair of spaced mold supports, said support having free ends that can sustain vibration, a shaft rotatably mounted on both supports, so that vibrations of the shaft can impart vibration to this support, a motor also mounted thereon, means whereby the motor imparts rotation to the shaft, and a pair of angularly adjustable weights, one mounted near each end of the shaft, said weights being unbalanced on the shaft.

2. In a vibrator mechanism, a portable support for a mold, having a pair of supporting arms, said arms having free ends so that they can sustain vibration, a shaft pivoted on said arms, and an unbalanced weight on said shaft for causing it to produce vibrations.

3. In a vibrator mechanism, a supporting structure, a horizontal load sustaining member supported at one end on the structure and having a free end, and means for impressing a transverse vibratory force on the member near its free end.

4. In a vibrator mechanism, a supporting structure, a horizontal load sustaining member supported at one end on the structure and having a free end, said means including a source of motion carried by the member.

5. In a vibrator mechanism, a supporting structure, a horizontal load sustaining member supported at one end on the structure and having a free end, and an unbalanced shaft having its axis transverse to the member and rotatably supported thereon.

6. In a vibrator mechanism, a supporting structure, a horizontal load sustaining member supported at one end on the structure and having a free end, an unbalanced shaft having its axis transverse to the member and rotatably supported thereon, and a driving motor for the shaft carried by the member.

In testimony whereof I have hereunto set my hand.

STEPHEN FLAM.