

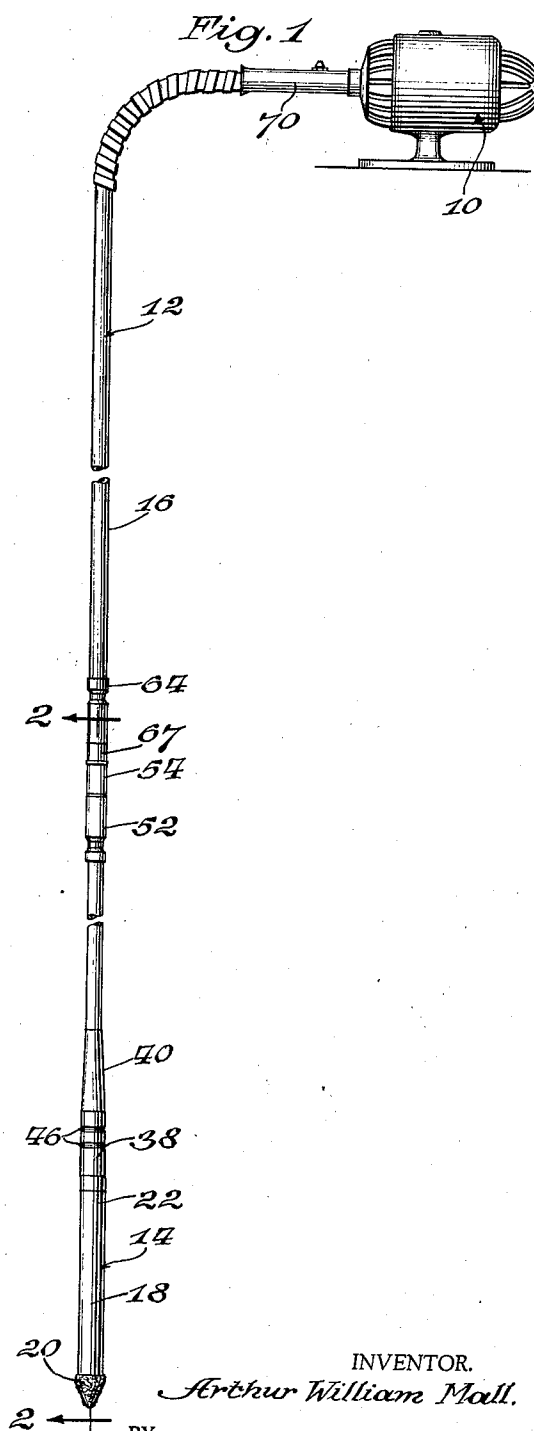
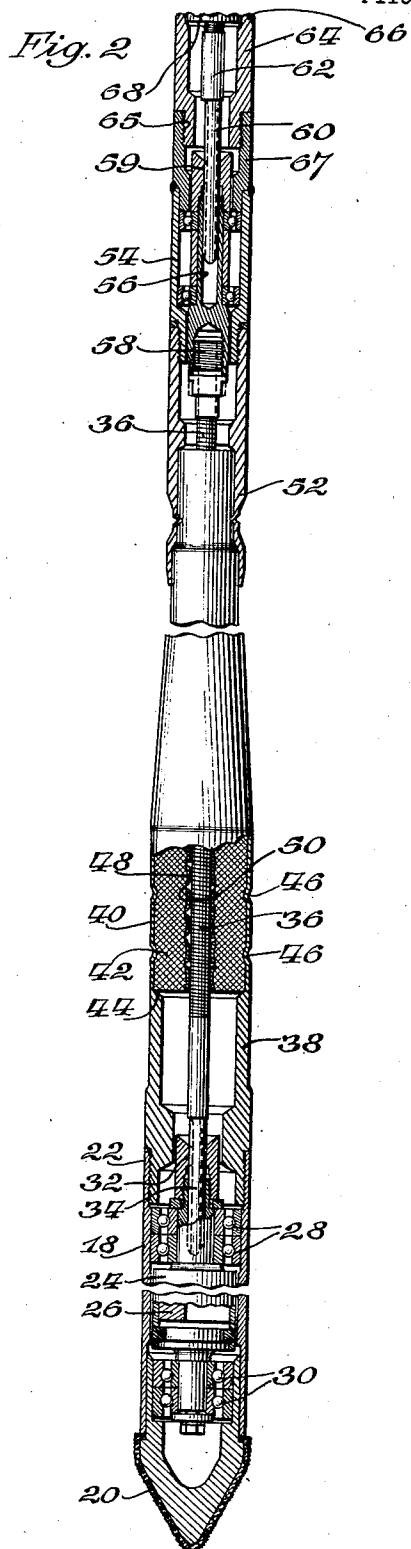
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A. W. MALL

2,167,987

VIBRATOR

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2,167,987

VIBRATOR

Arthur William Mall, Chicago, Ill.

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4 Claims. (Cl. 259—1)

My invention relates to improvements in apparatus for compacting plastic materials.

My invention relates more particularly to improvements in the construction of mass and form vibrators and like devices.

Vibrators of the type I have described are now well known on the market and have come into general use during the last few years. One example of the specific type of vibrator to which I refer is shown in the patent to Arthur W. Mall issued March 9, 1937, Number 2,073,393. While this patent shows an embodiment of a commercially successful vibrator, certain advantages over the same reside in the improved structure which is described in the following specification.

It is, therefore, an object of my invention to provide an improved vibrator construction far superior to all of the devices of the prior art.

A further object of my invention is to provide a vibrator having an improved resilient connection between the vibrator and the housing of the flexible driveshaft.

A further object is to provide a reenforcement for the flexible housing at the point of its connection to the vibrator housing.

A further object is to provide a connection between the flexible shaft housing and the vibrator housing sufficiently rigid to permit easy manipulation of the vibrator, yet sufficiently resilient to prevent the shaking and vibrations of the vibrator from being transmitted along the flexible shaft housing.

Other objects and advantages will be more apparent from the following description wherein reference is had to the accompanying sheet of drawings upon which—

Fig. 1 is a side elevational view showing generally a motor, a flexible shaft and a vibrator; and

Fig. 2 is a cross-sectional view taken on the lines 2—2 of Fig. 1 showing my improved connector between the vibrator and the flexible shaft.

In the embodiment of the invention which I have chosen to illustrate the same, I employ a motor 10, a flexible shaft 12 and a vibrator unit 14 secured to the motor by means of a flexible shaft housing 16. The flexible shaft and housing may, of course, be of any desired length depending entirely upon the purpose for which the vibrator is employed and the distance that the motor must be placed from where the work is to be done.

Referring to Fig. 2, the vibrator may be of the same general construction shown in the previously mentioned patent to Mall and include the housing 18 closed at its lower end by a hardened tip member 20 and having an open upper end 22.

A rotor member 24, provided with an offset weight 26, is positioned within the vibrator shell 18, being suitably mounted upon ballbearing races 28 and 30 in the ends of the vibrator. The upper end of the rotor member 24 is formed with a slotted opening 32 to engage the splined tip 34 of the usual flexible shaft 36. The shaft 36 may be enclosed in a shaft housing formed with a rigid shell member 38 adapted to screw-threadedly engage the upper end 22 of the vibrator shell 18.

The upper end of the housing 38 may be formed with a comparatively thin cylindrical wall 40 adapted to telescopically receive the tubular end of the shaft housing 42. The end of the same abuts against a shoulder 44 in the housing 38 and is held in place by a pair of grooves 46 adapted to be spun into the cylindrical wall 40.

The bell-shaped shaft housing 42 may be constructed of rubberized fabric and has walls of sufficient thickness to closely encircle the flexible shaft 36. A flat coiled spring member 48 engaging the circular opening 50 through the housing 42, serves to space the inner walls thereof away from the flexible shaft so there is no friction when the same is being operated.

The upper end of the rubberized fabric housing member 42 may be connected in a tubular ferrule of an end section 52 secured to the upper end of the housing. The section 52 is screw-threadedly connected to a coupling shell 54 which encloses a tubular stub shaft 56 that is screw-threadedly connected at 58 to the upper end of the flexible shaft 36. The stub shaft 56 is formed with a splined upper opening 59 adapted to engage the tip end 60 of a second flexible driveshaft 62. The driveshaft 62 may be suitably mounted in a ferrule 64 which has its upper end 66 connected to the usual flexible shaft housing 68. The ferrule 64 is formed with a lower threaded end 65 adapted to screw-threadedly engage in the coupling end 67 of the member 54. The flexible shaft 12 and its housing 16 may be of an indeterminate length and are connected by a suitable coupling member 70 to the motor 10.

From the above description it will be apparent that I have provided a construction wherein I employ a special flexible shaft housing as a connector between the vibrator and the flexible shaft housing that is connected to the motor. The shaft housing 42, which I have described as being constructed of a rubberized fabric, is capable of absorbing the shaking and vibration that takes place at the vibrator when the same is in operation. As a result and because of the fact that the flexible driveshaft which is connected to the motor

is not connected directly to the vibrator, it will be obvious that no vibration from the vibrator is transmitted to the motor. It will be further apparent that no vibration or shaking is transmitted to the section of flexible shaft that is of indeterminate length, thus adding greatly to the life of this unit.

Because of the fact that it is sometimes necessary to pull the vibrator out of the concrete being worked, over the board forms it will be obvious that the section 42 of the flexible shaft housing will readily take a bend of considerable radius and yet prevent the flexible shaft from being bent too sharply. It will be further apparent that because of the semi-rigidity of this member as compared with the usual flexible shaft housing, it has advantage in the handling of the vibrator in placing the same into and out of the work.

While I have illustrated and described a specific embodiment of my invention, it will be apparent to those skilled in the art that changes and variations may be made in the exact details shown and I do not wish to limit myself in any particular. Rather, what I desire to secure and protect by Letters Patent of the United States is:

1. An apparatus for compacting plastic materials comprising a vibratory member having an unbalanced weight therein, a flexible driveshaft operatively connected to said unbalanced weight, a housing for said flexible shaft, a resilient member connecting said flexible shaft housing and said vibratory member, a second flexible shaft, a

housing at the upper end of said resilient member, a stub shaft connecting said flexible shafts and a flexible housing for said second flexible shaft.

2. In apparatus of the class described the combination of a vibrator housing, a vibrator member having an unbalanced weight thereon mounted in said housing, a flexible shaft for driving the same, a flexible housing for said shaft and a bell-shaped rubberized fabric connector enclosing said shaft between the end of said flexible housing and said vibrator housing.

3. In apparatus of the class described the combination of a vibrator housing, a vibrator member having an unbalanced weight thereon mounted in said housing, a flexible shaft for driving the same, a flexible housing for said shaft, a bell-shaped rubberized fabric connector enclosing said shaft between the end of said flexible housing and said vibrator housing, a rigid shell at the end of said fabric connector, a stub shaft therein, a second flexible shaft and a housing therefor connected to said rigid shell.

4. An apparatus for compacting plastic materials comprising an elongated tubular vibrator housing, a rotary member mounted in said housing, an offset weight secured thereto and enclosed in said housing, a flexible drive shaft connected to said rotor, a flexible housing therefor and a semi-rigid resilient housing member fixedly connected between the open end of said vibrator housing and the end of said flexible shaft housing.

ARTHUR WILLIAM MALL.