This invention relates to improvements in electro-mechanical tampers. The primary object of this invention is the provision of a manually operable electric mechanical tamper which is small and compact and capable of efficiently packing fill; the same exerting a pounding effect on the fill rather than a vibrating effect, for the purpose of better compacting the fill.

A further object of the invention is the provision of an improved compact type of electrical mechanical tamper embodying a well balanced arrangement of details such as will enable an individual to readily operate the same without undue exertion for the purpose of securing fill compaction.

Other objects and advantages of this invention will be apparent during the course of the following detailed description.

In the accompanying drawing, forming a part of this specification, and wherein similar reference characters designate corresponding parts throughout the several views:

FIGURE 1 is a vertical longitudinal sectional view taken through the improved tamper showing details thereof.

FIGURE 2 is a vertical longitudinal sectional view taken through the tamper in a plane at right angles to the plane of FIGURE 1 and likewise showing details of the tamper.

FIGURE 3 is an enlarged cross sectional view taken substantially on the line 3-3 of FIGURE 2.

FIGURE 4 is a plan view of the tamper.

In the drawing, wherein for the purpose of illustration is shown only a preferred embodiment of the invention, the letter A may generally designate the tamper. It may include a frame structure B having a casing assembly C associated therewith. The frame B supports an electric motor D connected by means E to the tamper assembly C for reciprocating the same.

The frame structure B preferably comprises a vertical tubular cylindrical casing having a passageway or chamber 11 therethrough; the chamber being of the same diameter throughout its length. At its top the casing 10 has a plate 11 which may be detachable or welded to the casing 10, as desired.

The tampering structure preferably comprises a tubular standard 15 of cylindrical formation, reciprocably mounted in the passageway 11; the said standard 15 at the lower end thereof having a tampering foot 17 welded thereto. It may be flared laterally as at 18, if so desired. The standard 15 has an external diameter which is less than the internal diameter of the passageway 11; and therefore is spaced from the inner wall surface of the frame casing 10, as shown in FIGURES 1 and 2. At its lower end the casing 10 is provided with a fixed bushing 20 of any desired material, of ring-shaped formation, which fills the space at the locus of the bushing 20 between the outer surface of the standard 15 and the inner wall of the casing 10; the standard 15 is slidably through this bushing. Similarly at its upper end the tampering cylinder is provided with a fixed bushing 21 and the cylinder 15 likewise slides through this bushing. Lubricating cups 22 and 23 are respectively provided for the bushings 20 and 21, located detachably upon the casing 10; the bushings 20 and 21 having sloped surfaces to direct a lubricant into the slide surfacing of the cylinder 15 through the passageways of the bushings 20 for a purpose which will be well understood by those skilled in the art.

In order to secure true linear but non-rotatable reciprocation of the tampering cylinder 15 within the casing 10 I preferably provide a supporting screw 30 threaded in a passageway 31 provided in the casing 10, supporting at its inner end a sealed anti-friction bearing 32 which operates in a longitudinal slot 33 provided in the wall of the tampering cylinder 15. The adjustment of this anti-friction bearing 32, so that it will operate in the slot 33, is maintained by a lock nut 35 threaded on the supporting screw 30.

The electric motor D has a horizontal shaft 40. The casing of the motor is mounted upon an upper frame 41 which may be welded or detachably secured to inverted U-shaped members 42 welded or otherwise secured to the top wall 11 of the frame B, as shown in FIGURES 1 and 2.

Referring to the tampering drive means E, the shaft 40 at its other end is provided with a sprocket wheel 45. A countershaft 46 is rotatably supported in anti-friction bearings 47 upon standards 48 which may be detachably secured to the wall 11. The countershaft 46 lies immediately below the motor D and parallels the shaft 40 of said motor. The shaft 46 at its outer end is provided with a sprocket wheel 50 and is driven by a chain or belt 51, trained over the sprockets 45 and 50 and located slightly laterally of the housing or casing 10.

The countershaft 46 is provided, beneath the motor D, with a disc type eccentric 60 having a peripheral anti-friction bearing 61 therein housed within the head of connecting rod 62 which extends downwardly through an opening 63 in the wall 11 and into the upper end of the chamber 11 of the housing or casing 10, above the tamper.

Further referring to the tampering drive means E, a vertical rod 70 is reciprocably mounted through a passageway in a wall or plug 71 fixed within the upper end of the tampering cylinder 15. This rod 70 at the opposite sides of the wall 71 is provided with an upper compression spring 73 and a lower compression spring 74. The latter is held on the rod against the plug 71 by means of a nut 75. The upper end of the rod 70 is provided with a U-shaped head 77 against which the top of the spring 73 rests; said head 77 supporting a wrist pin 78 to which the lower end of the connecting rod 62 is pivotally connected.

The casing or housing structure 10 on one side thereof is provided with upper and lower transportation handles 80 and 81 respectively welded thereto.

The operator's handle structure 90 consists of a horizontal cross bar 91 welded to the upper end of the housing 10 between its ends; straddling the same uniformly and at the ends thereof the cross bar 91 is provided with laterally extending handle bars 92 having hand grips 93 thereon.

The motor D is provided with an electric cord and plug assembly 98.

The operation of the tamper will be apparent from the foregoing. The operator, by means of the handle structure 90, controls lateral movement of the tamper A. In one model of the invention the tamper has a total weight of about 140 pounds and the eccentric and connecting rod assembly is so set as to give a 2½ inch stroke 255 times per minute. The spring setup 73-74 is such that the operation of the drive assembly will jump the tampering foot off the ground for a 2½ inch stroke, and as aforesaid this gives a pounding effect rather than a vibrating effect and insures better compaction. Further-
more, the spring assemblage enables the tamper to have a harmonic action.

Various changes in the size, shape and arrangement of parts may be made to the form of invention herein shown and described without departing from the spirit of the invention or scope of the claims.

1. In a mechanical tamper the combination of an elongated tubular frame having a passageway therethrough, a cylinder reciprocably mounted within said passageway, bushings in the passageway having orifices through which said cylinder slides, said cylinder at one end projecting from the passageway of the tubular frame and at its opposite end having a wall, a tamping foot on the projecting end of the cylinder, a reciprocating rod slidably mounted through the end wall of said cylinder, compression springs telescoped on said rod at the opposite sides of said end wall, means on said rod holding said springs compressed to a predetermined extent against said end wall, a motor mounted on said frame, and means driven by the motor and connected to said rod for reciprocating the same and the cylinder therewith.

2. In a mechanical tamper the combination of a vertically elongated frame having an operator's handle structure connected at the upper portion thereof, a reciprocating tamper body slidably mounted within the frame for vertical reciprocation having a lower tamping foot and an upper wall, a rod slidably mounted in vertical position through said upper wall for reciprocation therein, spiral springs telescoped on the rod one at each side of the wall and each engaging said wall at one end, means on the rod holding the springs compressed against said wall, a motor mounted on said frame, and means connecting the motor with said rod for reciprocation of the same by alternate compression of the springs and for reciprocation of the tamping body.

3. Tamping mechanism comprising a vertically elongated tubular frame having an operator's handle structure connected at the upper portion thereof, a reciprocating tubular tamper body slidably mounted within the tube of the frame for vertical reciprocation therein having a lower tamping foot extending below the frame and an upper wall structure located within the tubular frame, a rod slidably mounted axially through said wall having ends projecting above and below the wall, a compression spring mounted on said rod at the upper end thereof above the wall engaging said wall and normally tending to urge the tamper body downwardly, a compression spring mounted on the lower end of the rod below the wall and engaging the wall and normally tending to move the tamper body upwardly, motor means mounted on said tubular frame and connected to the said rod for vertical reciprocation of the tamping body within the tubular frame, and means preventing relative rotation between said tubular frame and tubular tamping body.

4. A tamping mechanism as described in claim 3 in which the means to prevent relative rotation between the tubular frame and tubular tamping body comprises a vertical slot disposed in the tubular tamping body, a laterally adjustable member mounted on said tubular frame, and an anti-friction bearing mounted on said laterally adjustable member and movable therewith disposed within said slot and engaging the edges defining the slot to prevent rotation of the tubular tamping body within said tubular frame.

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